BRIDGING THE DIGITAL DIVIDE:
A CASE STUDY OF A COLLABORATION
BETWEEN A METROPOLITAN MUNICIPALITY
AND A NON-PROFIT ORGANISATION

by

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Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (safe to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: March 2017

Abstract

Currently, the human race lives in an era in which technology plays a large role. The latest technological devices, such as computers and smart phones are mostly used in tandem with access to the internet. It is unfortunately also a reality that people who have access to the internet, have the opportunity to further themselves in life, while other vulnerable and disadvantaged groups do not have the same opportunities. This gap is known as the digital divide. Access to the internet does not only mean being in possession of the device that can connect to the internet, but also having the opportunity to acquire the skills and expertise to be able to use the internet.

This study focuses on the role of the internet by illustrating how the internet can positively impact a person's life by linking them to economic and social opportunities. The role of the government to provide internet access to all citizens is also portrayed as a means to render service delivery more efficiently. Lastly, the study highlights the contrast within the digital divide between on the one hand, the positive impact and beneficial elements of having access to the internet and on the other hand, the negative effect and disadvantages it creates for individuals and consequently also for society as a whole.

The municipality in this study, in cooperation with a non-profit organisation, formed a partnership by utilising government resources in its responsibility as a service provider to provide internet access to its residents. This innovative initiative was made possible by the use of a supposed cost effective model and the cooperation of other companies which have acknowledged the importance of internet connectivity to as many people as possible.

The findings in this study are based on information from and behavioural patterns of the users' who make use of the service provided by the abovementioned initiative. Recommendations were made to both the municipality and the non-profit organisation in accordance to the users' behavioural preferences and how the service can be improved to reach more users. This study can be referred to as a step toward success in the digital history of South Africa.

Opsomming

Die mens lewe tans in 'n tydperk waar tegnologie 'n groot rol speel. Elektroniese toestelle, soos rekenaars en slimfone gaan meestal hand aan hand met die internet. Dit is ongelukkig ook 'n realiteit dat mense wat toegang tot die internet het, die geleentheid het om hulleself te verryk en moontlik hulle loopbane te verbeter, terwyl ander kwesbare en minderbevoorregte groepe nie daardie geleenthede het nie. Hierdie gaping staan bekend as die digitale kloof. Toegang tot die internet beteken nie net om die toestel te besit om toegang tot die internet te verkry nie, maar ook om die vermoë te hê en kundigheid te bekom om die internet te kan gebruik.

Hierdie studie fokus op die rol van die internet deur te illustreer hoe die internet mense se lewens positief kan impakteer deur aan hulle geleenthede tot die verbetering van hulle ekonomiese en sosiale lewens te bied. Die rol en verantwoordelikheid van die regering om toegang tot die internet vir so veel as moontlik mense moontlik te maak en om 'n effektiewe diens aan landsburgers te lewer, word ook uitgebeeld. In kontras met die positiewe impak wat toegang tot die internet op mense se lewens kan hê, verwys hierdie studie dan ook na die negatiewe gevolge van die digitale kloof op individue en gevolglik ook op die samelewing as 'n geheel.

Die munisipaliteit in hierdie studie, in samewerking met 'n nie-winsgewende organisasie, het die verantwoordelikheid van die regering as diensverskaffer opgeneem en saamgewerk om toegang tot die internet aan hulle inwoners te verskaf. Hierdie vindingryke inisiatief is moontlik gemaak deur die gebruik van 'n koste-effektiewe model in samewerking met ander ondernemings wat die belangrikheid van die internet in die lewe van mense raakgesien het.

Die bevindinge in hierdie studie is gegrond op inligting en gedragspatrone van die gebruikers in hulle gebruik van bogenoemde inisiatief se diens. Aanbevelings is aan beide die munisipaliteit en die nie-winsgewende organisasie gemaak na aanleiding van die gebruikers se gedragsvoorkeure en hoe die diens meer gebruikers kan betrek. Hierdie studie kan beskou word as 'n stap na sukses in die uitwissing van die digitale kloof in Suid Afrika.

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List of Abbreviations

3G	Third Generation
A4AI	Alliance for Affordable Internet
AM	Amplitude Modulation
BEE	Black Economic Empowerment
CCTV	Closed-circuit Television Camera
CEO	Chief Executive Officer
FIZ	Free Internet Zone
FM	Frequency Modulation
GB	Gigabyte
Gbps	Gigabits per Second
GEAR	Growth Employment and Redistribution
GHz	Gigahertz
GPRS	General Packet Radio Service
HTML	Hypertext Markup Language
ICT	Information Communication Technology
IDP	Integrated Development Plan
IEEE	Institute of Electrical and Electronics Engineers
IT	Information Technology
LED	Local Economic Development
MB	Megabyte
Mbps	Megabits per Second
MFMA	Municipal Finance Management Act
NDP	National Development Plan
NPO	Non-Profit Organisation
OECD	Organisation for Economic Co-operation and Development
RDP	Reconstruction and Development Programme
TCP	Transmission Control Protocol
UNISA	University of South Africa
VAT	Value Added Tax
VoIP	Voice over Internet Protocol
WWW	World Wide Web

1.   CHAPTER 1: Introduction

1.1   Background

The use of technology has become an embedded part of the daily routine for a large part of the population around the world. According to Vîrjan (2013:118), there is a direct link between the progress of humanity and the progress of technology and information. Within this context, the expansion of the internet has impacted the way in which people connect with one another, how they engage with society and how their perspectives are influenced by online content. Therefore, whether individuals are online for personal or business use, it affects the way in which they think about the world and how they will do things in the future.

The internet falls within the cluster of Information Communication Technology (ICT). According to Idowu & Awodele (2010:30), ICT may include the use of computers, mobile phones, e-business or commerce, video-conferencing and the internet. Different mediums can be used to connect to the internet, such as Wi-Fi, which is addressed in this study.

The necessity of providing Wi-Fi at a low cost to large communities evolved as a response to parts of civil society which are often excluded from the online world due to their socio-economic conditions, causing a rapidly growing digital divide. Callison (2004:1) stated that the digital divide refers to the gap between those who have access to ICT and those who do not have access.

1.2   Rationale and Problem Statement

Within developing countries, the challenge to bridge the digital divide is often not addressed adequately by government. According to Epstein, Nisbet & Gillespie (2011:96), the digital divide is often understood as a barrier of access to ICT, particularly when the government and/or corporations are responsible for funding infrastructure or ensuring increased access. The authors further argue that alternatively, when the digital divide is defined in terms of the individual's capability to use ICT, the responsibility may shift to the individual or educational institutions.

Although South Africa faces many challenges, the Global Information Technology report of 2015, released by the World Economic Forum, confirmed that South Africa is ranked considerably low on the Networked Readiness Index (NRI). Out of the 143 ranked economies in terms of capacity to prepare for, use and leverage ICTs, South Africa scored 75th place while affordability landed the country in 107th place and the general state of ICT readiness in 102nd place (Van Zyl, 2015:1). If measures are not taken in order to address these low rankings, the digital divide within the country will continue to broaden.

In focusing on the responsibility of government, as referred to by Epstein *et al.* (2011:96), as part of this study, the challenges which the South African government is facing to ensure equal access to ICT services will be explored. The basis of this challenge lies within government policies which need constant adaptation in order to support the rapid growth of ICT in South Africa.

Based on the understanding of the negative effects that the low NRI ranking showcased, and acting upon the responsibility as stated within government policies, the metro municipality referred to in this study, the City of Tshwane, have engaged in an innovative project with the aim to address the challenge of the growing digital divide.

The City of Tshwane collaborated with Project Isizwe, a non-profit organisation (NPO) with the vision of providing free Wi-Fi to South Africa. Within the context of this study, the Wi-Fi is free for the end-user whilst the municipality (City of Tshwane) is carrying the cost. However, the partnership between these two entities is unique and this study explores the way in which they approach the challenge of bridging the digital divide within South Africa.

1.3   Objectives

In view of the problem, as stated in the previous section, the objectives of this study are to:

1. Conduct a theoretical exploration of the digital divide and the state of connectivity within South Africa and globally.
2. Determine the role of the government through e-governance.

3. Identify the policy documentation that supports technological inclusivity and advancement within local government in South Africa.

4. Provide recommendations based on the behaviour of the users to improve the service of the City of Tshwane and Project Isizwe.

1.4 Research and Design Methodology

To achieve the objectives, as mentioned in the previous section, both non-empirical and empirical research were done. The non-empirical component of the study includes a secondary analysis of the relevant government policies, including the Constitution of South Africa, the various Acts related to municipalities, the Electronic Communications Act and the Local Economic Development Plan (LED). Other official documentation to support the case study included the Integrated Development Plan (IDP) of the City of Tshwane, as well as policy documentation from Project Isizwe.

The empirical data was gathered firstly through interviews that were conducted with the Wi-Fi project manager for the City of Tshwane as well as the Chief Executive Officer (CEO) of Project Isizwe. A second method consisted of questionnaires, which was designed to gain perspective into the behaviour of the Wi-Fi users. These questionnaires were given to a randomised sample of people at five pre-selected Wi-Fi hotspots. The hotspots were selected according to the users' geographical areas.

1.5 Limitations of the Study

During the data gathering process, the researcher observed that even after the questionnaires were thoroughly explained and the participants agreed that they understood the task ahead, the questionnaires were not correctly completed by all the participants. This led to a number of questionnaires that had to be disqualified in the research, resulting in a smaller randomised sample.

The researcher experienced challenges relating to the information from Project Isizwe as their reports and interviews were too technical for this specific study and had to be rewritten in order to be understood by the general public. Furthermore, due to the fact that Project Isizwe's staff are highly specialised

and their working hours differ from normal office hours, it was a challenge to gather information in the timeline set for this study.

1.6   Chapter Outline

The following subsection will provide a brief outline of the chapters in this study:

Chapter 2 consists of an extensive literature review that provides the necessary background to the main theme of this study. The impact of the digital divide on South African communities and the consequences of sustaining the divide is explored. A large section is devoted to understanding internet connectivity within South Africa and globally, where after the benefits of being connected for people and for government are discussed. The literature further investigates Wi-Fi as a medium to connect a large community. Policy documentation are presented in order to establish the support from government for this initiative.

Chapter 3 focuses on the case study of the City of Tshwane and how they engaged with Project Isizwe to connect thousands of people to Wi-Fi in an attempt to bridge the digital divide. The unique partnership between the two entities will be explored along with examples of how Project Isizwe supports the City of Tshwane's Vision 2055.

Chapter 4 explores the basis of the research methodology component used in this study. Analysis is drawn from the questionnaires, which provides insight into the behaviour of the Wi-Fi users and the impact that the service has on its users.

Chapter 5 concludes the research by providing recommendations to the City of Tshwane and Project Isizwe in order to increase the number of people who could connect to the network as well as to ensure effective engagement from the users to the technology. The chapter concludes with a brief overview of all the previous chapters and a summary of the main themes and findings, as well as suggestions for further research studies.

2.   CHAPTER 2: Literature Review

2.1   Introduction

In the previous chapter the background to this study, together with the rationale and problem statement were provided in order to gain an understanding of the problem that this thesis aims to address. It came to light that technology is pervasive in our present day and age, and has become an integral part of our daily lives. This thesis explores numerous positive contributions of technology that have had a significant impact on individuals, businesses and various other sectors across the world. Technology has shaped the way in which the human race lives every day, but most importantly, the way in which they communicate with one another.

Despite all the positive attributes of technology, which will be discussed in this section, value is not added to an individual's life if the person is excluded from the use thereof. Whether a person is excluded based on their failure to gain access to ICT or based on their lack of skill to engage with the technology, the result will contribute to broadening the digital divide.

This chapter will firstly introduce the fundamental concepts underlying this research paper, which sets the scene for the basis of this study. Thereafter the digital divide and the state of connectivity in South Africa, and globally will be discussed. This will be followed by the role of e-governance and what South Africa is currently achieving with technology. Wi-Fi as a medium to connect large communities will also be explored where after the chapter will conclude with the relevant regulatory framework geared to advance internet connectivity in South Africa.

2.2   The Digital Divide

Bornman (2016:264) argues that towards the end of the 20th century, societies all over the world had to change. The changes can be seen as the start of the information age. This means that information plays a pivotal role in the economic, social, political and cultural life in our society. It is strongly linked and connected to ICTs, assisting societies to create, store and distribute information

anywhere in the world. It is however obvious that not all countries are on the same developmental level and thus, disparities in the level of ICT will occur.

The term *digital divide* is defined and understood in various ways throughout the literature in the technological field. Rooksby, Weckert and Lucas (2002:197) argue that the phenomenon known as the *digital divide* occurs when only certain members of society have access to technology or the benefits that it generates. The authors further explain this argument by stating that the digital divide marks a gap that represents people who have high levels of access to certain new information and communication technologies and other people who have only little or none access to the same technologies.

A report released by the organisation for economic co-operation and development (OECD) (2015:5) refers to the digital divide as a gap between not only individuals, but between households, businesses and geographic areas at different socio-economic levels. The gap is explained in terms of their opportunities to access information and communication technologies (ICTs) and their use of the internet for a wide variety of activities.

Franda (2002:11) confirms this statement by explaining that the internet has not made any part of the world poorer, but it has contributed and still contributes to widening the gap between the better-off and worse-off parts of the world. This is purely because the internet has enabled some nations to create new sources of wealth. Martinez-Garcia (2013:2) elaborates on the statement by emphasising the importance of the adoption of new technologies by countries who are hoping to develop and increase productivity in order to generate wealth and create better living condition for its citizens.

Gibbs, Dosen & Guerrero (2009:16) take the matter as far as stating that individuals who fail to gain access and utilise new technologies can become disenfranchised and lack the ability to contribute positively to their community. It is becoming clear from the various definitions that access to ICT alone does not define the digital divide, but the required skills to use the ICT also contributes to the growing divide.

These definitions might succeed in broadly explaining the digital divide, but the divide is much more intricate than suggested. Rooksby *et al.* (2002:202), construed the digital divide as *connectivity*, referred to as the 'state of being on the right side' of the divide. The conditions of connectivity comprise three components, namely access to communication technologies, ability to use the communication technologies and lastly, the affordability thereof.

The first condition with regards to adequate access to communication technologies is rather undeniable as this would be a prerequisite in order to be on the right side of the divide. The authors defined adequate internet access when a person has access to the internet from their home or a public device which is linked to the internet and which can perform the basic internet activities. The person also has adequate time to spend on the device (Rooksby *et al.*, 2002:202).

The second condition, adequate ability to use communication technology, means the ability and confidence to use technology and more specifically, to perform basic internet activities.

The third and last condition, when both adequate access and adequate ability can be achieved through adequate affordability without significantly disadvantaging the financial position of the person, the person is classified as being on the right side of the digital divide (Rooksby *et al.*, 2002:202).

In addition to these components, the motivation of a person to use the technology plays a pivotal role. It will be worthless when the first three components are successfully achieved, but the user's motivation to use the technology is lacking. Rooksby *et al.* (2002:206), continue to argue that a lack of motivation or interest is a generally cited reason for target groups who find themselves on the wrong side of the digital divide.

Van Dijk & Hacker (2003:315) agree with Rooksby *et al.* (2002), that the inequalities associated with the digital divide stretch further than only gaining access to ICTs. The authors propose four barriers that determine digital inequalities, which include a lack of psychological (or mental) capability, skills

access, material access and usage access. People who have a psychological or mental barrier towards ICT are those who lack the basic digital experience due to lack of interest, digital anxiety and or the unattractiveness of the new technology. Lack of skills are however not the same as a lack of mental access as some people might be eager to use ICTs, but they are unfortunately not literate and therefore do not possess the required skills. Lack of material access refers to the absence of access to computers or other ICT infrastructures, while lack of ICT usage refers to a lack of meaningful ICT usage or opportunities to do so (Van Dijk & Hacker: 2003:320).

Bornman (2014:7) argues that discourse on the digital divide has focused primarily on developing countries, with South Africa in particular regarded as one of the least computerised regions in the world. This is mainly due to the lack of network infrastructure and basic infrastructure such as electricity. In a research study conducted on the digital divide in South Africa, Bornman (2016:276) states that not only does South Africa have a long way to go, progress at the end of the study done in 2011 were scarcely happening.

The findings from the abovementioned study proved discourse in South Africa and on the information society have placed a major focus on infrastructure development and the appropriate policy environment, but that there are other important factors impacting on the individual ICT usage and digital divide that exist within the country.

The findings indicated firstly a considerable gender gap, where male respondents had more access to ICTs than females. In the category for mobile internet usage, 40% more men than women made use of the internet through their mobile phones. A second factor relates to educational levels where relatively high levels of ICT usage were only observed for people with tertiary qualifications. Lastly, a deep division between South African population groups were revealed of which social and cultural dynamics, as well as the oral tradition of African cultures could have played a role (Bornman, 2016:276).

In conclusion, as stated throughout this section, the critical issue with regards to the digital divide is not only the lack of infrastructure of ICT, but the literacy

and skills of the person using the technology. Having a computer or mobile device with access to the internet, does not mean that development have taken place. The deployment of infrastructure will only be effective when the person can engage with the technology in a constructive manner. The next section will focus on the concept of *internet connectivity* and will provide insight from a South African and global perspective as to where the world currently is and where South Africa needs to be.

2.3 Internet Connectivity

The following section will focus on the internet, specifically related to the inception thereof, as well as an introduction to the state of internet connectivity in South Africa and globally. Thereafter a discussion will follow on the benefits of internet connectivity, closely linked to the access of potential employment benefits that can be reaped from enjoying internet connectivity.

2.3.1 Inception of the Internet

The history of internet connectivity has taken the invention of computers and the medium of communication on a journey through time. The internet evolved over time, it was never created by one specific scientist or organisation, and thus it came into being as a result of a process over a period of a few years.

Windom (2002:1) defines the internet as a network of networks that spans the globe, clarifying the misconception that the author believes many hold by understanding the internet to be a single network. The networks, which constitute the internet, are typically owned by various public and private organisations, universities, companies and governmental military establishments.

In the 1960s, the predecessor of the internet was the ARPANET. The acronym is linked to developers from the Advanced Research Projects Agency (ARPA) in the United States. The first message that was ever sent over the ARPANET from one computer at the University of California in Los Angeles to another at Stanford University was on 2 October 1969. The envisioned word was supposed to be "Login," but only "Lo" was delivered (New Media Institute, 2014:1).

It was Sir Tim Berners-Lee, a software engineer at the European Council for Nuclear Research who, during 1989, wrote a paper titled "Information Management: A Proposal." The feedback from Berners-Lee's manager at the time, Mike Sendall, was not extremely enthusiastic and it was argued that the concept is too vague.

Despite the manager not showing support for the idea, Berners-Lee was determined to prove a universally-linked information system. According to Owen (2014:1), Berners-Lee further wrote the Hypertext Transfer Protocol (HTTP), the Hypertext Markup Language (HTML) and thereafter the famous web browser, the World Wide Web (WWW). This became known as the internet.

The Internet can be described essentially as being underlined by a suite of protocols called Transmission Control Protocol (TCP) and Internet Protocol (IP), which render transitions possible over a diverse interconnected network. It was Vinton Cerf and Bob Khan who made it possible for computers to connect over other networks across the globe in a virtual space (National Media Museum, 2012).

2.3.2   The South African Reality

A study conducted on digitalisation suggested that during 2016, out of the total South African population consisting of 54,72 million people at the time of the study, 26,84 million people (or 49% of the total population) are active internet users. Furthermore, 59% use the internet on a daily basis, 26% at least once or twice a week, whilst 12% indicated that they use the internet once a month. Only 3% noted usage less than once a month (Kemp, 2016:390, 392).

Active internet users grew with 5% from 2015 to 2016, whilst the number of active social media users and mobile subscriptions grew with 10% and 8% respectively (Kemp, 2016:387). Gillwald, Moyo & Stork (2012: iv) stated that ownership of mobile devices stood at 84% of the adult population (15 years of age and older) during 2012, while 92% were recorded in 2015 (Kemp, 2016:388).

The National Development Plan (NDP) (2011:162) states that, compared to other nations, performance of ICT is slipping down international benchmark rankings, whilst communication quality, speed and cost are also significantly worse in South Africa. The NDP emphasises the potential of ICT as a critical enabler of economic growth, communication and productivity. However, Middelton in Bornman (2016:268) argues that these enablers are only achievable when reliable and high quality infrastructure deliver a wide range of ICT applications and services to a population that is literate and ready to participate in the digital community and to become part of the information society.

Lesame (2013:73) conducted a study which included national and international data that proved the use of ICT in South Africa is declining. According to Padayachie (2010), South Africa experienced ICT deployment challenges as a result of government policies that were not successfully followed through. The government had since needed to source the support of the private sector and other relevant stakeholders in order to improve the roll out of the ICT infrastructure and development.

Gillwald, *et al.* (2012:5), argue that due to the lack of effective policy implementation since the mid-1990s, the result today is an uncompetitive market structure, compromised regulatory effectiveness and weak institutional arrangements, which left South Africa plummeting down international ICT indices. The authors further note that the high cost of broadband in die country is a serious challenge. This causes a barrier towards growth in broadband required for South Africa to catch up to the rest of the world as well as for enterprises who must make use of it, regardless of the price.

As a possible support and aiding tool to the described reality, Gillwald *et al.* (2015: iv), suggest that regulatory assessment is required to address the impact of the current broadband reality of cost and communication in South Africa. Policy and regulatory attention is required to aid the bottlenecks constraining operators and potential players from responding dynamically to the changing nature of communications. South Africa is still faced with massive policy

challenges in its strive towards the creation of conditions for large-scale investment in order to deal with demand for high speed broadband (Gillwald *et al.,* 2015: iv).

However, despite the challenges ICT faces in South Africa, according to Menell (2015:1), when South Africa is compared to the other BRICS countries (Brazil, Russia, India, and China), it is one of the top ranked economies that has a firm level of technological absorption, which is advantageous as it increases competitiveness. The author further states that South Africa is ranked best at availability of the latest technology, at the forefront of having access and being able to adapt to the latest technology, but most importantly, ranked highly in terms of technological readiness.

2.3.3   The Global Reality

In 2014, there were 2,9 billion people who were internet users globally, whilst in 2015, the figure increased to 3,2 billion people, 43% of the world's population. Out of the 3,2 billion people, 2 billion were from developing countries (Wu, Jackman, Abecassis, Morgan, De Villiers & Clancy, 2015:1).

It is estimated that during 2014, 4,3 billion people were not connected to the internet, whilst in 2015, the figure decreased to 4,1 billion people and during 2016, to 3,9 billion, concluding that 53% of the world's population is not currently internet users (International Telecommunication Union, 2016:3). During 2015, the United Nations set out, as part of the Sustainable Development Goals (SDG), that everyone should have access to the internet by 2020. However, if this trend continues with no concrete action steps to rectify the slow growth, 3 billion people will remain offline by 2020, nearly all in developing countries (Wu *et al.*, 2015:3).

Furthermore, in an annual research initiative conducted by the Alliance for Affordable Internet (A4AI), seeking to understand why certain countries have succeeded in creating affordable internet and universal accessibility, it predicts that the goal of the SDG will only be reached 22 years after its set date, thus 2042. Reaffirming the statement regarding the number of people who will not

be internet users by 2020, the A4AI states that without urgent action, only 16% of people in the world's poorest countries and 53% of the world as a whole will be connected in 2020. To clarify, the A4AI stated that "we [the world] won't just miss it, we'll miss it with a mile" (A4AI, 2016:4).

In a response to the poor statistics, the A4AI wrote an affordability report to assist government leaders during the planning process of reaching this goal. Failure of achieving this goal will not only lead to lost economic opportunities, but will potentially also deny many people access to online services that could benefit their present and future living.

Achieving universal connectivity is a major challenge faced by countries across the globe, especially for developing countries. It is therefore important that governments ensure that their policies and actions are aligned to create the momentum necessary in the progress towards first, connectivity and second, global connectivity. This should include the private sector and other relevant stakeholders such as information technology companies and data service provides. Falling behind will not only impact the people of the country, but it will impact the country as a whole in terms of economic competitiveness, industry and trade and investor opportunities from neighbouring countries.

2.3.4   Benefits of Internet Connectivity

The internet should not be viewed in isolation in terms of what it can mean for the individual alone. It should rather be viewed from a perspective of what the internet can do for an individual within the greater whole. The internet can act amongst others, as an enabler of economic growth, educational opportunities, the promotion of public services, social cohesion, digital inclusion and can also assist in health care improvements which impact not only the individual, but the community as a whole (Deloitte, 2015).

The World Bank Group released a World Development Report, titled "Digital Dividends," focusing on the current technological challenges faced by the world. With respect to the benefits of being connected to the internet and making use of its full potential, the report states that through inclusion and innovation, access provides opportunities that were previously out of reach to the poor and

disadvantaged (WBG, 2016: xiii). This section will focus on the two key role players in utilising the benefits of the internet, namely the people and the government. For the purpose and the context of this study, one of the major benefits for people being connected to the internet, namely for economic advancement will be discussed. Within the case study as discussed in Chapter 3, other benefits related to education and knowledge accumulation will be discussed. Concerning government, the literature will focus on e-governance, and the developmental blocks of participation and empowerment.

2.3.4.1 People: Access to potential employment benefits

Citizens are the core beneficiaries of the positive benefits of the Internet. The World Bank argues that job opportunities will contribute to the success of the inclusion of society. When a person is employed, they become active members of society as they can sustain themselves and also economically contribute to society as a whole. Therefore, it is essential to have high employment figures to ensure the sustainable and continuous growth of a country. South Africa is facing a major challenge with unemployment and the beam of light is not shining brightly on the hope for improvement.

Mqolomba (2016:1) proposes that a solution to solving the high unemployment rate within the country, is local enterprise development. By promoting community-based enterprises and micro and small enterprise development, these tools can be utilised to provide opportunities for the rural poor to generate their own income. He continues by linking this development with the World Bank Report by stating that cooperatives and small business enterprises have proved to be key organisational forms in building new models to combat social exclusion and poverty.

With access to internet connectivity, people in rural areas will be able to search for job opportunities at their own convenience.

As the world, have become increasingly digitalised, so has the labour market. Most job opportunities are advertised online and require the applicant to complete an online form. This is of course not applicable in all cases, but being connected to the internet will enable a job seeker to read about the company's

policies, strategies and other related information which will be beneficial should they qualify for an interview. Information and documentation from the potential employer could also be obtained through an electronic mail account and this medium could also potentially strengthen the communication between the employer and employee, once hired. In terms of efficiency and productivity of the limited hours in a day, seeking job opportunities online increases the amount of job opportunities that can be applied for as walking around from business to business takes time and could potentially also cost money when travelling costs are involved.

Mqolomba (2016:1) emphasises that South Africa should prioritise local enterprise development approaches to stimulate local economies and that it should utilise local resources in order to establish competitive advantages that create the linkages between economic growth and employment creation in rural economies.

Connectivity to the internet will not only enable users to seek employment, but also to potentially create it for themselves, which could lead to the creation of more employment opportunities within the community. With the support from government and the local business sector, this initiative could potentially have a major positive impact on the employment rate of rural communities once it starts developing momentum.

2.4   The Role of the Government through E-Governance

The following section will address the second objective of this thesis which is to determine the role of the government through e-governance. The shift from paper to electronic media where government services are available to citizens online, refers to e-government, which is concerned with providing public services and value added information to citizens (Odat, 2012:1015). Marche & McNiven (2003:75) further explain e-government as using internet technologies to provide routine government information and transactions through electronic means.

The fundamental success factor of e-government lies in its effectiveness. The fact that information can instantly be distributed to millions of citizens across

various geographical areas at the same time is an astonishing realisation for government. The definition of e-government can be categorised in three distinct categories: "government to citizens, government to business and government to government" (Odat, 2012:1014). With respect to these categories, the advantages of e-government include, but are not limited to the facilitation of business flow, government services and transactions between sectors of government and business. Furthermore, advantages include increased career opportunities, profitability and coordination between state institutions (Odat, 2012:1014).

As e-government became more popular throughout the world, the term e-governance were introduced. Kroukamp (2015:53) argues that e-governance changed the way in which governments in all spheres interact and communicate with one another and with their citizens. According to Marche & McNiven (2003:75), e-governance can be seen as a technology-mediated relationship between citizens and the government. Dawes (2008:S86) elaborates on the explanation of Marche & McNiven by stating that e-governance can support the relationship amongst citizens, the government and business sector, as well as public services and government administration.

E-governance are intertwined with e-services or e-service delivery which means that services are now digitalised and can be delivered electronically. Nkoma (2012:3) explains that e-service delivery shows a government's willingness to provide services to its citizens in the quickest, most sufficient way. Furthermore, traditionally, all services were delivered face-to-face which is easy reachable in city areas, but not always able to reach rural communities where transport is poor, roads are inaccessible and government departments are scares. For this reason, services are increasingly delivered electronically in order to assist people to access services from their home and avoid needing to physically visit government buildings.

During 2001, South Africa had already seen the potential of e-governance and released a document titled "Electronic government: the digital future; a public services IT policy framework" through the Department of Public Service and

Administration. The policy focused on the three major areas, namely e-government, e-services and e-business. One of the major e-government success case studies in South Africa is the South African Revenue Service (SARS) and its interactive online portal.

SARS implemented an e-filing system that allows taxpayers to conveniently complete an online form with all their personal and tax-related information, which then automatically generates the amount of tax payable or refundable. This service makes it possible for workers to complete their tax documentation in the comfort of their home, office or space where internet connectivity is available at any given time. This means that workers can avoid the long queues at the SARS offices, making their day more productive and eliminating travelling costs.

Another e-government example within South Africa is its National Government's online website where a large volume of relevant information and online services can be accessed. This includes, but are not limited to citizens wanting to register the birth of a child, obtain their identification document, apply for grants such as social or pension grants, registering and paying for their motor vehicle license or television licence (South African Government: 2016:1).

Within the local government sphere, municipalities are also presenting their services online. For instance, on the City of Cape Town's website, one can engage with online content ranging from service requests, which include but are not limited to reporting faulty streetlights, road repairs, flooding, tree removal or electricity meter queries. Other services include registering and paying for municipal accounts, pet registrations, plans and land use applications, as well as applying for job opportunities (City of Cape Town, 2016:1).

Smart phone applications have become a popular tool to use when quick access to information is needed. Within an application, the options of choices are limited, the layout is done in a way where the most important information is shown first and hence it could potentially save time as appose to searching

through a whole website to find something specific. The government of South Africa also designed an application where the latest news can be accessed, quick active links to government leaders, contact information, social media, general services, job opportunities and much more.

2.4.1   Digital literacy of Civil Servants

Despite the positive attributes that e-governance can bestow upon citizens, the reality is that civil servants who wish to serve the public through information and communication technology, should acquire the necessary digital literacy in order to serve the public (Mbatha, 2015:50). In a recent research study focusing on digital literacy of civil servants in selected South African government departments in Kwazulu-Natal, it was concluded that inadequate emphasis is being placed on the matter of equipping civil servants with the necessary digital literacy skills that they require in order to improve service delivery. The research further suggested that servants had acquired their current digital literacy skills by themselves and that training within the sector should be introduced in order to equip civil servants with the necessary digital literacy skills to use the tools to beneficial services for the public (Mbatha, 2015:49).

Although South Africa is in the fortunate position to have a relatively well-developed ICT infrastructure that is currently providing both the government and the public with access to ICT tools and services, there are still major problems within the South African government departments with regards to the use of ICTs (Mbatha, Ocholla & Le Roux, 2011).

The five major problems, as identified by Mbatha, Ocholla & Le Roux (2011), are firstly, the lack of ICT skills among civil servants; secondly, the attitude of civil servants towards the use of ICTs; thirdly, the lack of technical expertise and focus on objectives regarding the use of ICTs in the sector; fourthly, the resistance of staff to use ICT; and lastly, the lack of information about ICT and their perceived benefits.

This section has illustrated that the South African government have shown efforts and have allocated resources to keep up with the new ways of governance through the concept of e-government. Although there have been

various successful case studies within the country, there remains a lack of digital literacy among civil servants. The next section will elaborate on how online governmental platforms can support development and advance participation amongst community members and with government.

2.4.2 Participation and Empowerment: How connectivity to the internet is supporting development

Since South Africa became a democratic country in 1994, various policies and frameworks such as the National Development Plan (NDP), the Growth, Employment and Redistribution (GEAR) policy, the Black Economic Empowerment (BEE) initiative and the Reconstruction and Development Programme (RDP) were introduced to address the inequity of the past and bring equal opportunities to all citizens.

The vision for the socio-economic policy framework of the RDP, is to embrace people-centred development. According to Davids (2009:17), people centred-development is a starting point to address injustices of the former government's development efforts. Meyer & Theron (2000:5) argue that the principles of people-centred development through the relevant building blocks of development have become an integral part of policy-making in South Africa after 1994. These building blocks include public participation, social learning, empowerment and sustainability.

This section focuses on the ways in which connectivity to the internet supports and accelerates the building blocks of development with reference to participation and empowerment. Literature on people-centred or people-focused development are extensive in the field of public administration. This is not a new concept, but a worthy and relevant concept. The shift from top-down approaches, where government places their decisions down on the community to bottom-up approaches, where the community provides valuable input to the decision-making process, has been the norm in various policy frameworks and the successes thereof have also shown and encouraged other frameworks to adapt accordingly.

2.4.2.1   Building Block 1: Participation

Swanepoel & de Beer (2006:28) argue that participation does not mean involvement, as involvement simply means that people can take part in a project, but under prescribed conditions. Rather, when people are mobilised to participate, they are participating in their full capacity and become part of the decision-making and planning process. The authors further state that the liberal view of participation argues that firstly, the people living in the addressed community have a common sense of knowledge of the environmental dynamics and this can thus be of immense value to the development efforts. Secondly, it has been established that people who are not participating in their own development have no affinity for development efforts and their results. These are of course not the only reasons for participation. De Beer & Swanepoel (1998:20-24) argue that every adult, no matter in which income class they are categorised, has a right to be part of the decision-making mechanisms affecting his/her development. The authors further emphasise that it is the democratic right of people to participate in matters influencing their future.

For years, there have been 'traditional methods' that were followed by community change agents in order to encourage citizens to participate in matters that affect them directly. The change agents were also trained to assist the participation process in order to ensure that all members have an equal voice. These traditional methods are not discouraged, but Brabham (2009:245) explores these methods of public participation such as town hall meetings and public planning meetings and added that there are potential negative consequences to these type of methods as such. In public meetings, where agendas can be pushed down on people who might not necessarily understand all the jargon from experts who are trying to create development within the community. The community might feel their knowledge to contribute to the problem-solving process is inferior when tools such as graphs and maps are presented to them and they do not have the necessary knowledge to understand and interpret them.

However, participation within the context of this study can be viewed from a rather radical alternative perspective. Brabham (2012:307) argues that

governments are increasingly turning to the internet to support accountability, transparency and public participation initiatives and that there is a growing interest in innovative online problem-solving models to serve the public good. Within this context of participation, Jenkins (2006:8) uses the term *participation* as cutting across "educational practices, creative process, community life and democratic citizenship" (Jenkins, 2006:8). Encouraging youth to develop skills, knowledge, ethical frameworks and self-confidence to be full participants in contemporary culture, should according to Jenkins (2006:8), be the goal of participation.

2.4.2.2   Building block 2: Empowerment

Extensive research across the world has been conducted on the youth and their lack of interest in news and politics. According to a lead researcher in this field, "in the areas of social life that affect and concern them [the youth] to a much greater extent than adults, most notably education, political debate[s] [are] conducted almost entirely over their heads" (Buckingham, 2000:218). The author further draws a picture by describing politics in the news as a sport that the youth watches, but not engage in it. However, with the new ways of engagement available to the youth through online digital media, the opportunities for the youth to engage in civic debates, to participate in community life and to become political leaders have fundamentally changed the view most youth have held until now.

In order to support Buckingham's argument, a prominent case study within South Africa regarding the tuition fees of higher education will be discussed. Since 2015, this case study has been enjoying heightened media attention and the situation is currently still very relevant. In brief, #feesmustfall is a student lead protest movement for free education at South African Universities. In the context of this specific study, the focus is not on whether the tuition fees must be eliminated or not, but rather on how the movement gained momentum through online digital media.

A hashtag '#' was created in order to connect this event over various social media platforms such as Facebook, Twitter and Instagram. The protests started

in October 2015 at the University of the Witwatersrand and within hours, it had spread to other universities across the country. According to Thomas (2015:1), social media has been used throughout the course of the protests not just to organise and disseminate messages, but to actively subvert the traditional media approach to the protest. He further argues that it is unlikely that protesters would have been able to organise actions across campuses and institutions as effectively without social media platforms. Apart from informing students on various campuses regarding the protests, messages on Twitter were tweeted from students seeking help where security have isolated them and restricted access to water and food.

Nyamhunga (2015:1) stated that the new movement of conscious young Africans is taking advantage of modern communication channels such as social media, in particular Twitter through hashtags, not only to raise awareness, but to coordinate protests and petitions. Nyamhunga, who is a student from the University of Zimbabwe wrote:

> As a young educated population starts to question the existing socio-political order, no longer willing to accept that political freedom itself is enough, young people also want to live in a way that reaffirms this freedom, that is, with dignity and also live in a country where they have equal opportunities (Nyamhunga, 2015:1).

Tracking back to what Buckingham (2000:218) said with regards to the lack of interest towards news and politics amongst young people, it has changed dramatically in recent years as a result of the influence of technology, specifically the internet and social media platforms associated with the internet. The internet has changed the way in which people can now actively participate, it has evolved from reading an article in the newspaper and wait for the community hall meeting a month later to reading the article online and immediately commenting or completing an online poll or survey. By being informed, people are empowering themselves to actively participate in matters that they are aware of and which they understand the meaning of.

This method in itself being very powerful and positive, unfortunately negatively contributes to the digital divide as people cannot actively participate or become part of the online community when they lack access to the infrastructure or lack

the knowledge to use the technology. With reference to the #feesmustfall case study, those students who did not have access to the internet during the time of the protests might not have been informed immediately of unplanned violent protests and could have found themselves in a vulnerable position.

2.5   Wi-Fi as a Medium to Connect Large Communities

Many people living in rural communities are often isolated and unable to afford the cost of ICT and as a result, are being excluded from the potential benefits thereof (Harris & Harris, 2001:1). ICTs are not necessarily deployed for economic functions exclusively, but are also used for social and educational purposes. It is a "socially contingent means of communicating information and that the internet is to be seen as a modality of cultural transmission" (Leaning, 2006:3).

According to Graham (2016:1), fixed-line access in rural communities is essentially unheard of as the residents mostly rely on their mobile phones for personal and business use. Furthermore, according the Graham (2016:1), the motivation to deploy Wi-Fi in rural communities is mainly for economic reasons as it's a cost-effective way of connecting residents and does not require massive infrastructure requirements, hence it is achievable across geographically dispersed areas. Other advantages include the fact that it can easily be deployed and there are no license requirements.

The next section will focus on defining Wi-Fi and exploring further advantages of using Wi-Fi as a medium to connect rural communities.

2.5.1   Brief definition of Wi-Fi

Whilst engaging with literature on Wi-Fi, various understandings of the term emerged. Stobing (2016:1) argues that Wi-Fi does not mean anything specifically, nor is it an abbreviation of any specific word. The term *wireless fidelity* is often used by people referring to Wi-Fi, but according to Stobing (2016:1), the name is a marketing term, created by an advertising agency in 1999. Baker (2016:1) supports the statement that the term *Wi-Fi* is not an abbreviation for a specific word. It is pronounced 'why-fy' and refers to

"technology that allows pcs, laptops, mobile phones or table devices to connect at high speed to the internet without the need for a psychical wired connection" (Baker: 2016:1).

In essence, Wi-Fi is generically used when referring to any type of 802.11 network (Downsett, Kenny & Johnson, 2006:300). Stobing (2016:1) further explains that 802.11, which by 1997 the Institute of Electrical and Electronics Engineers (IEEE) agreed upon, quickly changed to 802.11b. The 'b' standard supported a transmission rate of around 11Mbps on the 2,4GHz spectrum, with spectrum referring to the wireless spectrum that Wi-Fi routers use to communicate with the devices that they are connected to. Currently, the world is working at 802,11ac which is 1,3Gbps over both 2,4GHz and 5GHz spectra simultaneously (Stobing, 2016:1).

Wi-Fi uses radio frequencies to send signals between devices. Escobar (2015:1) explains how Wi-Fi transmits and receives in the Gigahertz range while car stereos receive frequencies in Kilohertz and Megahertz, AM and FM stations. Unlike a car stereo, "Wi-Fi is essentially 2 radios communicating back and forth that use lower power and broadcast over a much shorter distance" (Pullen, 2015:1). This is how it is possible to upload and download data from the internet.

2.5.2 Advantages of Wireless Networking (Wi-Fi) compared to Wired Networking

Due to rural areas that are generally scattered populations, using wireless networks are more economically feasible than high cabling costs on a wired connection. Secondly, the installation of a wireless network is simpler than the installation of a cable network as the latter is more complex in areas with rivers, roads or other obstacles which separate facilities. The installation time of a wireless network is also known to be shorter compared to a more time-consuming installation of a cable network. Thirdly, a wireless network offers the benefit of reliability whereas cable networks are known for system downtime due to cable faults. Lastly, a wireless network offers the benefits of portability which means greater flexibility when relocating (Liew, 2004:282).

Supporting the abovementioned statement that a wireless network is a more economically feasible option, Galperin (2005:49) wrote:

> Wi-Fi can deliver high bandwidth without the wiring costs, which makes it an effective replacement for last mile delivery, as well as for backhaul traffic where the installation and maintenance costs of a wired infrastructure are prohibited.

The author further explains the widespread industry support for the Wi-Fi standard, which is coordinated through the Wi-Fi Alliance. The Alliance is an industrial organisation including over 200 equipment makers worldwide and as a result the price of equipment have declined whilst the compatibility between devices has become more effective (Galperin, 2005:49).

Chetty, Blake & McPie (2006:336) refer to case studies where Wi-Fi networks have been deployed in various rural areas. The examples include deployments in the Dominican Republic, India and the United States of America. Different methods were utilised to connect the areas such as a combination of Voice over Internet Protocol (VoIP) and Wi-Fi, which proved to be a cost-effective solution compared to other types of networks such as a cable network.

Given the reality in South Africa, with the extensive cellular network coverage in rural areas, it may be argued that cellular technologies, such as third generation wire (3G) or General Packet Radio Service (GPRS) should be utilised. However, the pricing scheme for these technologies in rural areas with a low population density and low disposable income is not feasible (Chetty *et al.*, 2006:336). Bhagwat (2004:38) confirms the statement by elaborating on the fact that cellular services are value-priced for markets where users are willing to pay high costs and therefore cannot be applied to rural areas.

2.6 Lawful Framework Supporting Internet Connectivity

The previous sections discussed the advantages for citizens to connect to the internet, as well as the concern for the digital divide that is rapidly growing. This sections aims to describe the appropriate lawful provisions within the local government sphere to ensure that internet connectivity should be provided to its citizens.

The Constitution of the Republic of South Africa, 1996 describes the South African government as three distinctive, interdependent, and interrelated spheres of government namely national, provincial and local government (Republic of South Africa, 1996). According to the Constitution, each government sphere has its own areas of jurisdiction and the division of authority is based on a geographical, as well as a functional basis. On a national level, government is responsible for governing South Africa as a whole, while the nine provinces are governed on a provisional level and local government is divided into municipalities. This section will first give a brief overview of local government where after municipalities will be explored.

2.6.1   Local Government

Koma (2010:113) states that within communities, local government is defined as the sphere of government that is the most well-placed to appropriately respond to local needs, interest and expectations of the citizens. According to Roux (2011:64), local government can be described as public organisations that are authorised to manage and to govern the affairs of a given territory or area of jurisdiction. In turn, Reddy (in Van der Waldt *et al.*, 2014:3) defines local government as "the level of government created to bring government to the local populace and to give citizens a sense of participation in the political processes that influence their lives."

The White Paper on Local Government further elaborates on developmental local government by stating that it is "local government committed to working with citizens and groups within the community to find suitable ways to meet their social, economic and material needs and improve the quality of their lives" (Republic of South Africa, 1998(c):23).

Furthermore, Section 152 of the constitution states that:
"(1) [t]he objects of local government are-

(a)   to provide democratic and accountable government for local communities;

(b)   to ensure the provision of services to communities in a sustainable manner;

(c)   *to promote social and economic development;*

(d)   *to promote a safe and healthy environment; and*

(e)   *to encourage the involvement of communities and community organisations in the matters of local government."*

As discussed, local government is the sphere of government closest to the citizens and lawfully becomes responsible for the execution of service delivery and social development within each jurisdictional area. To better explain this sphere of government, Reddy and Brenner (in Van der Waldt *et al.*, 2014:4) describe five characteristics unique to local government:

1. *Locality:* This refers to a relatively small geographical area in which a sense of community consciousness is present.
2. *Legal personality*: This refers to the constitutional arrangements, legislation and regulations that define the powers of local government.
3. *Autonomy*: This refers to the ability of local government to make binding decisions and policy choices within a legally stipulated framework and to allocate resources and provide locally specific services.
4. *Governmental powers:* This refers to the authority to carry out formal governmental functions such as revenue collection, the allocation of resources and the making of political choices.
5. *Participation and representation:* This refers to the way in which community representatives are elected or appointed to serve people, and the way in which people have the opportunity to participate in government affairs.

2.6.2   Municipalities

Municipalities can be viewed as the lowest form of democratically elected government in South Africa. There are 278 municipalities within South Africa, comprising 8 metropolitan municipalities, 44 district municipalities and 226 local municipalities (The Local Governance Handbook, 2013:16).

As explained earlier in the section about local government, municipalities have its core functions dictated according to Section 152 of the Constitution. Further, elaborating on Section 153 of the Constitution, it stipulates that:

"1) A Municipality must:

    a) structure and manage its administration, and budgeting and planning processes to give priority to the basic needs of the community, and to promote the social and economic development of the community.

    b) participate in national and provincial development programmes."

Section 154 provides a supporting net for municipalities by introducing co-operate government, which stipulates that:

"(1) The national government and provincial governments, by legislative and other measures, must support and strengthen the capacity of municipalities to manage their own affairs, to exercise their powers and to perform their functions.

(2) Draft national or provincial legislation that affects the status, institutions, powers or functions of local government must be published for public comment before it is introduced in Parliament or a provincial legislature, in a manner that allows organised local government, municipalities and other interested persons an opportunity to make representations with regard to the draft legislation."

Section 156 of the Constitution refers to the powers and functions of municipalities. It stipulates that a municipality has executive authority in respect of, and has the right to administer, amongst other duties, the local government matters listed in Part B of Schedule 4 and Part B of Schedule 5, as well as any other matter assigned to it by national or provincial legislation.

Schedule 4 of the Constitution which refers to the functional areas of concurrent national and provincial legislative competence, stipulates in Part B that local government is responsible for, but not limited to local tourism, municipal planning, municipal health services, municipal public works and trading regulations.

Schedule 5 of the Constitution refers to the functional areas of exclusive provincial legislative competence with Part B stipulating local government

matters to the extent set out for provinces include but are not limited to billboards and the display of advertisements, local amenities and public places.

There are various Acts of Parliament that define municipal structures of which the most important Acts are:

- The Intergovernmental Relations Framework Act No. 13 of 2005
- The Local Government Municipal Property Rates Act No. 6 of 2004
- The Local Government Municipal Finance Management Act No. 56 of 2003
- The Local Government Municipal Systems Act No. 32 of 2000
- The Local Government Municipal Structures Act No. 117 of 1998
- The Local Government: Municipal Demarcation Act No. 27 of 1998

Section 155 of the Constitution determines the establishment of municipalities in three distinct categories:

"(a) Category *A*: A municipality that has exclusive municipal executive and legislative authority in its area.

(b) *Category B*: A municipality that shares municipal executive and legislative authority in its area with a Category C municipality within whose area it falls.

(c) *Category C*: A municipality that has municipal executive and legislative authority in an area that includes more than one municipality."

Table 2.1: Metropolitan Municipalities in South Africa

SOUTH AFRICA'S METROPOLITAN MUNICIPALITIES			
MUNICIPALITY	PROVINCE	SEAT	POPULATION
Buffalo City	Eastern Cape	East London	755,200
City of Cape Town	Western Cape	Cape Town	3,740,026
City of Johannesburg	Gauteng	Johannesburg	4,434,827
City of Tshwane	Gauteng	Pretoria	2,921,488
Ekurhuleni	Gauteng	Germiston	3,178,470
eThekwini	KwaZulu-Natal	Durban	3,442,361
Mangaung	Free State	Bloemfontein	747,431
Nelson Mandela Bay	Eastern Cape	Port Elizabeth	1,152,115

Source: (Alexander, 2015:1).

Table 2.1 illustrates the eight metropolitan municipalities in South Africa. The case study referred to in Chapter 3 of this study is under the jurisdiction of the City of Tshwane, a metropolitan municipality which is located in the Gauteng Province. Metropolitan municipalities are referred to as category A municipalities which executes all functions of local government for a city or region. Metropolitan councils have single metropolitan budgets, common property ratings and service-tariff systems. They may also decentralise power and functions, however, all original municipal, legislative and executive powers are vested in the metropolitan council.

2.6.3   Frameworks

As part of the duties and responsibilities of a municipality, it must implement various plans, programmes and strategies in order to develop and assist the growth process of its juridical area. In the context for the study, an overview of the Integrated Development Plan (IDP) as well as the Local Economic Development (LED) plan will be discussed.

2.6.3.1   Integrated Development Plan (IDP)

The South African Department of Provincial and Local Government defines integrated development planning as a process through which municipalities prepare a strategic development plan for a five-year period which is directly

linked to the term of office for local councillors. Strategic planning is an instrument that guides and informs planning, budgeting, management and decision-making within a municipality (Republic of South Africa, 2003:4).

Section 26 of the Municipal Systems Act stipulates that an IDP must reflect:

> *"(a) the municipal council's vision for the long-term development of the municipality with special emphasis on the municipality's most critical development and internal transformation needs;*
> *(b) an assessment of the existing level op development in the municipality, which must include an identification of communities which do not have access to basic municipal services;*
> *(c) the council's development priorities and objectives for its elected term, including its local economic development aims and its internal transformation needs".*

The Municipal Systems Act of 2000 requires all municipalities (this includes metropolitan municipalities, district municipalities and local municipalities) to undertake an integrated development planning process in order to produce integrated development plans. It is not only a legal requirement for municipalities to prepare these plans, but also forms part of their developmental responsibilities to ensure that the quality of life for its citizens is improved. A plan such as the Integrated Development Plan will assist municipalities in managing the process of fulfilling these developmental responsibilities (Republic of South Africa, 2003:5).

Benefits of integrated development planning according to Venter (in Van der Waldt, 2014:111) include being a tool to alleviate poverty, to act as an agent of transformation, to serve as a vehicle to facilitate communication, to ensure local corporate governance, to ensure sustainability, to be instruments of overcoming the Apartheid legacy, and a tool for focused budgeting.

Within the context of this study, the IDP of the City of Tshwane will briefly be introduced in this section whilst a practical application to achieve the desired outcomes of the IDP will be discussed in Chapter 3.

The City of Tshwane's strategic focus as set out in the 2016-2021 IDP presents the city with a vision for 2055. This vision reads:

> In 2055, Tshwane is liveable, resilient and inclusive and its citizens enjoy a high quality of life, have access to social, economic and enhanced political freedoms and partners in the development of the African capital city of excellence (City of Tshwane, 2016:5).

In order to achieve this vision, emphasis on ICT and connectivity should take preference. Within the IDP (2016:102), the City argues that with access to the digital landscape, the quality of service provision will improve. Furthermore, it will create an environment for citizens where access to numerous opportunities exists within the social and economic environment. The initiatives to achieve access to these opportunities and to transform the way in which the City is doing business within the digital context, includes:

1) broadband infrastructure roll-out;
2) expansion of free Wi-Fi connectivity, and
3) transformation towards smart customer services within the digital context.

As a further means, the Digital Citizen Programme was designed to develop participation models in order to strengthen participatory governance by means of creating digital communication platforms through various media forms. The City have already established that through the roll-out and implementation of broadband and Wi-Fi, the foundation has been laid for the creation of a digital platform and e-governance solutions that will continue to improve communication internally and externally with stakeholders and communities (City of Tshwane, 2016:151).

2.6.3.2   Local Economic Development (LED)

The National Framework for Local Economic Development in South Africa, (2006:10) proclaims that "local economic development is about creating a platform and environment to engage stakeholders in implementing strategies and programmes" (Department of Provincial and Local Government, 2006:10). This materialises when a joint endeavour by local agencies and/or the people

are formed that engage in actions to unify communities and business in order to improve economic and social conditions within an area (Nel, 2001:1006).

2.6.4 Electronic Communications Act (Act no 36 of 2005)

Through the policy in the Electronic Communications Act, the Government of South Africa envisages the launch of a national project, 'South Africa Connect', which will mobilise the capabilities, resources and energy of both the public and private sectors, together with civil society, in order to connect South Africans to each other as well as South Africa to the continent and the world (Republic of South Africa, 2005:4).

The following section will elaborate on the four strategies developed by the government in order for South Africa to close the gap of the digital divide and to reach the vision of seamless information infrastructure by 2030.

2.6.4.1 Digital Readiness – Laying the foundations for South Africa's broadband future

Planning and transformation will include transitional measurements, which will be implemented to ensure optimal utilisation of critical network assets and capabilities of state-owned companies. The indications to achieve the desired outcomes include market structure and an arising regulatory regime, institutional capacity, rationalisation of state-owned-companies, enabling investment in infrastructure, spectrum, legal and regulatory framework and lastly, analysis, information and indicators.

This sector has high degrees of vertical integration and limited infrastructure competition outside the metropolitan areas. It is crucial that effective open access wholesale regulation is present in order to address market dominance and enable service-based competition. There are various legal and regulatory frameworks that would need to be established, such as a cyber-security framework, which would include secure payments and protection of personal information, cyber law which will protect the rights and privacy of users and lastly an ICT sector law, focusing on ICT institutional arrangements, universal access and service delivery mechanisms (Republic of South Africa, 2005:31, 38).

In order to support investments in infrastructure, measurements such as efficient permit granting, access to and use of existing physical networking infrastructure, and coordination of civil works and transparency will be amongst the measurements focused on in order to ensure investment in under-supervised areas. Inefficiencies and constraints that are preventing the roll-out will be addressed in order to achieve higher productivity and effectiveness (Republic of South Africa, 2005:36).

2.6.4.2 Digital Development – Addressing needs and ensuring sustainable roll-out

"Government will invest in broadband infrastructure through aggregation of public sector demand and smart procurement of high capacity networks" (Cwele, 2014:1). The positive effects of these aspects will lead to government administration and e-governance to digitally enable key social functions as well as support emerging smart city requirements.

Coordination between the government, responsible departments and other authorities will be crucial to ensure that specific requirements in each sector are met. The network requirements as part of the digital development strategy of the Electronic Communications Act, includes an expanded public sector network to provide high speed broadband connectivity; dedicated connectivity for all schools in order to make the educational system more effective; and to provide flexible, open learning environments; dedicated connectivity of all public health care facilities; and lastly, free public Wi-Fi at public points reached by public sector networks.

The investment from government in network services are justified by looking at the administrative efficiencies and enhanced service delivery that can be achieved when government facilities are connected via broadband. In order for the digital development strategy to be successful, key indicators such as coordination of planning and implementation across sectors should be facilitated while smart buying of network equipment for future use should be carefully monitored. Other requirements include measurements that will be implemented in order to enable uptake and usage. These includes improved e-

governance services, the availability of educational content, and the use of tablets or mobile devices in schools.

2.6.4.3   Digital Future – Roadmap for public and private investment in the next generation broadband network

The planned initiatives of the digital development strategy that have already been discussed, coupled with the roadmap for public and private investment, and the initiative on digital opportunities which will be discussed after this section, will bring South Africa closer to the improvement of broadband access and quality in the country.

> South Africa's broadband extension has to be a collaborative initiative – one that establishes a high capacity, high quality network that builds on existing infrastructure and involves both private and public sector players and is accessible to all on a non-discriminatory basis through open access regulation (Republic of South Africa, 2005:45).

It is therefore necessary to build a national broadband network which will stimulate the building of broadband network infrastructure by reducing investment risks.

In terms of wireless broadband access networks, it is important to note that due to the high cost of fibre networks, wireless access solutions will be implemented in parallel with planning and implementation of fibre access networks. Immediate roll-out of these solutions are required and therefore the deployment speed of a wireless network is favourable.

The required conditions for a national wireless network are the use of existing facilities, such as base station locations, fibre links for backhaul, and long distance connectivity which will minimise costs through infrastructure sharing and fair market competition for service providers on a cost-based, non-discriminatory basis. In order to achieve this, support from the highest level of government is required as well as pricing incentives to attract users.

2.6.4.4   Digital Opportunity – Capability and Skills

The reality of the inequality of access to ICTs and the ability to deploy it, lies in the unequal capabilities of individuals and groups, particularly those in rural

areas, the elderly and persons with disabilities. Therefore, in order to use ICTs, a correlation between education and income is strongly observed. Those who are marginalised from education and income are likely to be marginalised from communication services required to participate in a modern economy and society.

Human development is viewed as the key success factor in ensuring social and economic inclusivity in a society knowledge economy. The Electronic Communication Act's scope focuses on, but is not limited to supply and demand skills, content and application and affordability and accessibility.

Supply and demand skills are high-level skills required in knowledge production to create innovation between the Department of Education and Training, the Department of Science and Technology and the Department of Communication. The initiatives include engineering and technical skills for the design and build of operation networks, software developers and programmers to produce digital content, instilling digital skills through the school curriculum and develop a national digital literacy project for those marginalised from ICT services.

Content and application, or 'Open Data' by the government would include free access to various spheres of government data. Digital inclusion does not only mean the roll-out of networks, it is dependent on the availability of the relevant content for users. "The content across broadband networks is the crux of the knowledge economy and information society, without relevant content-related strategies in e-governance, including e-health, e-education, we are unlikely to succeed" (Republic of South Africa, 2005:51).

Affordability and accessibility of devices is a particular challenge for low income households due to the high costs associated with devices such as smart phones, laptops and desk computers. This is a significant barrier to broadband adaption, uptake and usage.

Initiatives such as the local assembly of ICT products, the design and manufacturing for use within the African content and for export opportunities

will be supported and encouraged. Measurements to provide financial support and development will be created to ensure growth of the local ICT manufacturing industry, job creation and the reduction of relying on imported equipment (Republic of South Africa, 2005:53).

It is realised by the policy that due to inequalities in capabilities, the access and use of ICT services amongst South Africans are limited. The policy makes strong reference to the relationship that would need to be built between the Department of Communications and the Departments of Basic and Higher Education.

2.7   Summary

The literature presented on the state of connectivity from a South African and global perspective provides insight in to the reality of the world and where South Africa finds itself. It is with these facts and figures that the concern for the growing digital divide can simply not be ignored by government. Despite the South African Government's effort to improve the use of ICT within the country, there are still many obstacles to overcome and considerable progress to be made.

As discussed, the internet can act as a significant enabler for economic growth within the country, creating job opportunities, increase productivity and efficiency, and provide people with educational insights. Due to the high cost of deploying and maintaining ICTs, as well as the skills to operate the technology, there are certain groups who may easily be excluded from the use of ICTs. These issues as discussed must be addressed and government needs to intervene in order to ensure equal access to all groups.

The next chapter will focus on a unique initiative which the government has engaged in to address bridging the digital divide. The initiative is described as a case study between the City of Tshwane and Project Isizwe and illustrates how Wi-Fi can be distributed to communities.

3. CHAPTER 3: The City of Tshwane Bridging the Digital Divide in Collaboration with Project Isizwe

3.1 Introduction

In the previous chapter, a theoretical overview of the digital divide and the state of connectivity were explored, followed by the role of e-governance, Wi-Fi as a medium to connect large communities and lastly, the legal framework supporting internet connectivity in South Africa. As part of the introduction section of Chapter 3, a short background summary of the City of Tshwane and Project Isizwe will be presented. Thereafter, the first main theme will explore the relationship between the City of Tshwane and Project Isizwe which describes the onset, agreement and sustainably of the partnership. Secondly, the technical process will be illustrated to showcase the various steps in order for Wi-Fi to successfully reach the end-user. The third part of this chapter focuses on the role that Project Isizwe plays in order to support the City of Tshwane's vision for 2055, specifically related to fighting the triple challenge of poverty, unemployment and equality.

3.1.1 City of Tshwane

The City of Tshwane is a metropolitan municipality, formerly known as Pretoria, and forms a local government within the Gauteng Province. The mandate of the City is to deliver efficient, effective and affordable services to its residents through a developmental system of efficient, effective local government. The City strives to optimally deliver core services to meet the needs of residents and businesses operating within the City and the visitors to Tshwane (City of Tshwane, 2015:1).

3.1.2 Project Isizwe

Project Isizwe is registered as a non-profit organisation (NPO). 'Isizwe' is derived from Zulu, meaning nation, tribe and people. The project's goal is to provide internet access to people across Africa through the roll-out of free Wi-Fi in public spaces in low-income communities (Project Isizwe, 2016:4). In this context, Wi-Fi is free for the end-user, but funded through the City of Tshwane.

Project Isizwe was initially formed to address digital inequality, which in turn created the foundation for addressing other forms of inequality. Project Isizwe partnered with the City of Tshwane to provide citizens with access to a free daily quota of bandwidth through the deployment of high-quality Wi-Fi networks at the lowest possible cost (Neotel, 2016:2).

Tshwane's Free Internet Zones (FIZs) can be seen in Figure 3.1 below. There are currently approximately 900 active Wi-Fi sites, also referred to in the figure as zones. These sites are situated at various public locations such as tertiary educational buildings, recreational venues, clinics, libraries, schools and other service centres.

Figure 3.1: Tshwane Free Internet Zones
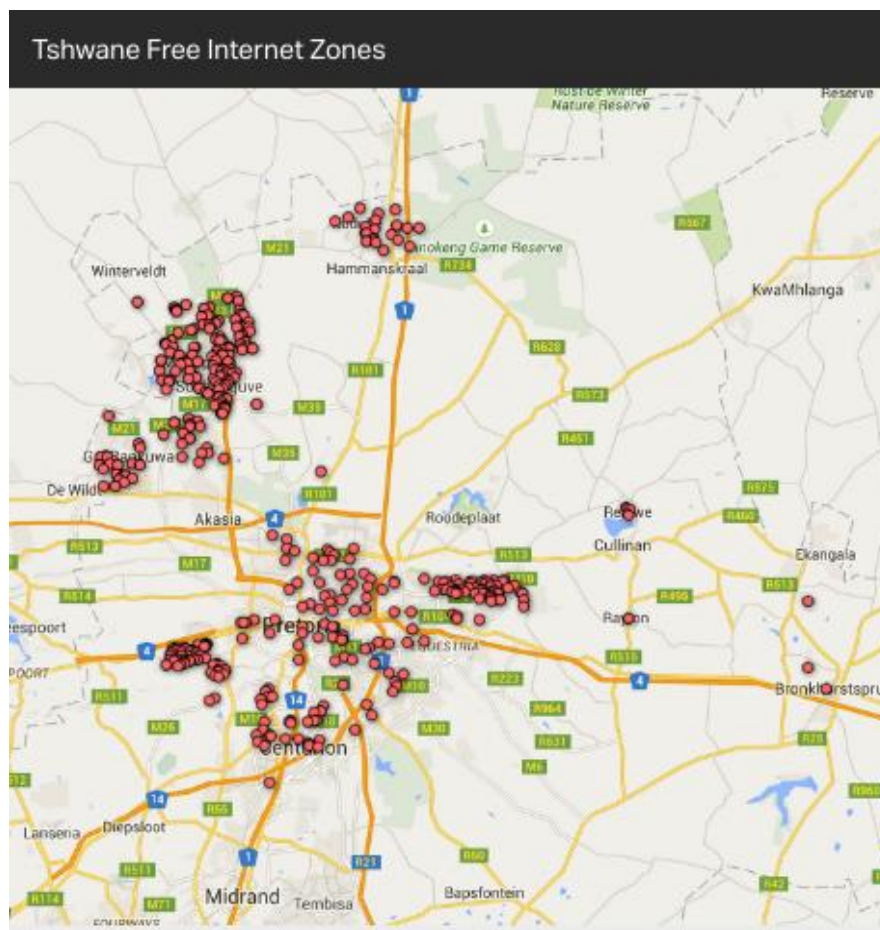
Source: (Project Isizwe: 2016(a):1).

3.2   Partnership between the City of Tshwane and Project Isizwe

The partnership came together when the vision and goals of both the municipality and Project Isizwe appeared to be in sync in terms of the expected outcomes. Since the first phase was deployed in 2013, the visions of both entities have become stronger, more intertwined and more dependent on each other.

The study found that the basis of the agreement between Project Isizwe and the City of Tshwane was Section 67 of the Municipal Finance Management Act (MFMA). The funding model was therefore based on a grant made to a NPO. The study does not express an opinion on compliance of the MFMA or the supply chain management regulations, but rather focus on the potential and successful collaboration of local government and third parties to address the digital divide.

During the State of the Capital Address in 2015, the Executive Mayor, Kgosientso Ramokgopa, stated that the City's vision for Wi-Fi access was to ensure that all citizens are within walking distance of free Wi-Fi by the end of 2016. The long-term vision for Wi-Fi in the city entails deployment at every street, corner and household in the City (Ramokgopa, 2015:1). The City also sets out a bold vision in the 2055 Vision Report to render the City of Tshwane "liveable, resilient and inclusive" (City of Tshwane, 2013(a):21). The report further argues that Wi-Fi is a key enabler to support its efforts in fighting the triple challenge of poverty, unemployment and inequality.

Project Isizwe focuses on harnessing the power of the internet in low-income communities for educational purposes, which in turn acts as an enabler for change. The organisation works alongside governments to plan, roll-out and maintain free Wi-Fi networks, which triggers a multiplier effect on the economy and create employment. Their vision statement further reads: "We want to give all South Africans the power to access information, education and jobs online to bridge the digital divide between South Africa and the developed world, in turn improving the status of the continent" (Project Isizwe, 2016:1).

3.2.1   The Establishment and objectives of the Partnership

According to Masango (2016), project co-ordinator of the Wi-Fi project for the City of Tshwane, the City does not have enough resources and capacity to run such a project by themselves and therefore had to converge in a partnership with a service provider. With regards to the grant confirmation and agreement on service levels in terms of Section 67 of the Municipal Finance Management Act 56 of 2003, the following section outlines the partnership between the City of Tshwane and Project Isizwe.

Project Isizwe and the Municipality have agreed to work together to achieve three key objectives. Firstly, the provision of the service in the agreed sites on a 'best effort' basis to achieve maximum line-equivalent speeds of 1 Mbps (megabits per second) and 256 Kbps (kilobits per second) for downstream and upstream respectively. To avoid any doubt, the service aims to achieve an average download speed of 125KB/s (kilobytes per second) and an upload speed of 32KB/s (kilobytes per second) per device. Secondly, provision of a maximum bandwidth usage of 250MB (megabyte) per day to each device that connects to the service. Currently, Project Isizwe achieved a maximum bandwidth usage of 500MB (megabyte) per day. The third objective is to provide the service from the commission date for a period of three years, of which the commission date for this specific phase was 21 October 2013 for Phase 2.

3.2.2   The obligations and roles of both the municipality and Project Isizwe

With reference to Appendix A, the grant agreement establishes the obligations and roles for both the City of Tshwane and Project Isizwe. The Municipal Finance Management Act are referenced repeatedly in order to ensure that Project Isizwe report and monitor key performance indicators of the FIZ to ensure that they adhere to the agreement. The City of Tshwane is responsible to provide access to their equipment, facilities and employees in order to assist Project Isizwe when installing the Wi-Fi service. The researcher observed that it is imperative that both parties are actively aware of their obligations and roles as the effectiveness of the project would be adversely affected if all the parties to the agreement does not perform optimally.

3.2.3   The sustainability of the partnership

The Municipality may notify Project Isizwe in writing at least three months before termination of the Project that it wishes to renew the project. The parties will then enter into a new agreement on terms acceptable at that time. There is no obligation on either party to renew the contract. The agreement shall commence on the agreed date and shall expire three years after the last commission date or reasonable notice by either party or upon the parties concluding any other agreement that supersedes the original agreement.

Currently, the three-year term is almost at the end and the agreement should be reviewed. With a new ruling party voted in during the term of the contract, at the time of this study, the future of the project has not yet been made public. Although the procurement methodology employed in the agreement between Tshwane and Isizwe are under question by the newly elected council of Tshwane, it did not form part of this study.

3.3   Technical Process: How the Wi-Fi Reaches its Users

Figure 3.2: Technical Process
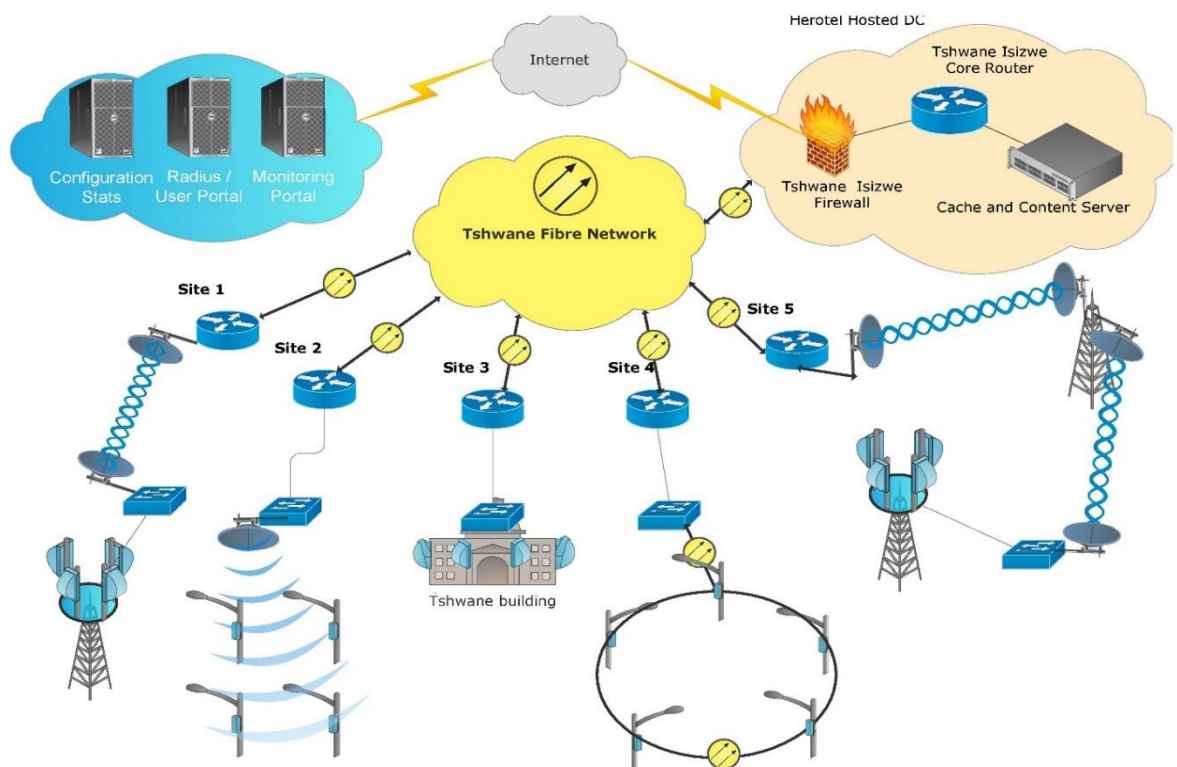
Source: (Devine, 2016:1).

Figure 3.2 illustrates the three separate fibre networks of the City of Tshwane which deliver different services, for example:

1. The *Electricity Dark Fibre Network* is used to manage the equipment at substations.
2. The *Tshwane Information Technology (IT) Multiprotocol Label Switching Network* is used to connect all IT and Voice Systems of the City of Tshwane.
3. The *Metro Police Camera Network* is used to operate the closed-circuit television (CCTV) cameras around the city.

During the roll-out, Project Isizwe made use of all the above-mentioned networks to deliver a single service to the people of Tshwane. These networks form the backbone to carry all the data to the main data centre.

Project Isizwe further deploys FIZs in and around the entire City. These zones provide Wi-Fi access in a 150-meter radius from the access point. As indicated in Figure 3.2, the zones can be deployed in any number of ways, such as on buildings, street poles, towers, etc. The free zones use wireless backhaul links to the high sites located mainly on water reservoirs and towers from where the data is then transported either directly via fibre or high capacity microwave links to the nearest fibre aggregation point. Thereafter the data is transported to the core. When a user connects, he or she is served with a landing page which they have to connect to and enjoy access of 500 MB worth of data for that day.

3.4 Vision 2055: Fighting the Triple Challenge – Poverty, Unemployment, Equality

The purpose of Vision 2055 is to provide the City of Tshwane with a broad development logic to guide the City's intervention and programme decision-making process over the next few decades. It serves objectives such as to assess and adjust the organisation's strategic direction in response to a changing environment, to open up public discourse on key challenges whilst developing appropriate solutions. It also focuses on detailing the City's interventions that are aimed at breaking the cycle of generational poverty,

inequality and underdevelopment. The next section will attempt to illustrate how Wi-Fi connectivity is supporting Vision 2055.

3.4.1   Cost-Effective Solution to Benefit the Poor

The model created between the City and Project Isizwe ensures that people who are living in poverty are not excluded from the service, but can enjoy the benefits thereof at no direct cost to them. With the vision of rolling out Wi-Fi within walking distance from low-income communities, citizens can walk to their nearest Wi-Fi site without the burden of paying for transportation.

In terms of the grant funding obligations in the agreement, there shall be no invoices or commitment to pay at the commencement date of the agreement. Project Isizwe shall fund the project as of the commencement date to ensure that the sites listed in the agreement are implemented. Grant funding obligations as set out in the agreement are subject to a site acceptance form which must be completed and signed by both parties. An invoice will be raised as per the site acceptance date reflected on the completed form for an amount of R249 000 excluding value added tax (VAT), payable 30 days from the invoice date (City of Tshwane, 2013(b):5).

Currently, according to Devine (2016:1), the price per site has been lowered to R230 000 due to a decrease in installation and maintenance costs. The cost per site includes 36 months of service, covering all costs, such as bandwidth, monitoring, support, maintenance and replacement of equipment. An approximate monthly amount of R4 500 from the initial R230 000 contributes to operation costs per site in order to deliver 500MB per user on a daily basis, as well as providing unlimited content portal access on the Tobetsa platform. This platform is the main content platform to which a user is automatically directed to once internet connection has been made.

According to Thatcher (2016:1), the total cost to date has been R277 million over three years, which has been approximately R92 million per annum. This includes the roll-out of, maintenance of and service provision to all the internet zones that have been established across the City. It is argued that the cost-

effective nature of this project is mostly because of the non-profit structure of Project Isizwe, meaning there are no profit margins on what the municipality pays (Thatcher, 2016:1).

Project Isizwe has partnered with Neotel and Herotel in order to deliver their services in more affordable ways. Neotel is a network operator and the initial sponsor of the 1 GB bandwidth needed for the service. Herotel and Project Isizwe have a vendor relationship governed by a Service Level Agreement whereby Herotel is a service provider to Project Isizwe. Herotel provides the resources used during the deployment phase as well as maintenance of the deployments.

3.4.2   Platform Addressing Unemployment and Equality

From the moment, a Wi-Fi user has made a secured internet connection to a FIZ, Tobetsa is the first and main content platform to which the user will automatically be directed to. This platform offers the user unlimited access, which means it does not use data from the 500MB that is provided per device, per day. The purpose of the platform is to allow Wi-Fi users to have easy access to content that could firstly support them in their educational endeavours, and secondly, assist them with their job seeking process or start-up business. Thirdly, it simplifies the way in which they engage with their local government.

In order to address these three purposes, the platform is linked to content pages which include, but are not limited to Wi-Fi Learning, Wi-Fi Entrepreneur, Wi-Fi Jobs and Government Resources. Within each content page there are various ways to access the information and engage, such as specialised applications which can be used online or uploading and registering on databases for job opportunities. The discussion of the four mentioned content pages will follow.

3.4.2.1   Wi-Fi Learning

For the youth residing in low-income communities, such as where the FIZ are located, the knowledge of accessing higher education and the aspiration to improve their economic status might easily be over-shadowed by the socio-economic conditions surrounding them. Section 29 of the Constitution grants citizens the right to basic education and much emphasis is placed on educating

the children of the country. After basic education is completed, higher education is a key element to the future of the country as Walker & Mkwananzi (2015:47) argue. They state that if an individual misses an opportunity to access higher education, opportunities in terms of employment and economic productivity are also lost.

Having access at no direct cost to the correct information regarding higher education could already be a step closer to enrolling in a programme in order to achieve a qualification. Furthermore, South African universities are becoming more modernised by making use of technology in order to enhance the learning experience. For instance, Stellenbosch University makes use of blended learning methods, which include digital material, online assessments and online assignment submissions at various degree levels. Through this Wi-Fi initiative, a user can firstly gather the necessary information in order to make an informed decision on the type of higher educational qualification the user wishes to apply for. Secondly, Wi-Fi at no direct cost to the user could assist the user to keep up with the digital demand that the qualification might require. The main focus of this content page is to enrich the educational abilities of the user. Easy access to online textbooks, online information, previous examination papers as well as mobile books are all tools to assist with current educational studies or to guide users to educate themselves.

The content page includes applications such as 'Zander' to assist young children in learning basic educational skills, such as language (words and spelling), numbers, shapes and colours. This application is available in five of the official South African languages.

Other content includes online textbooks in Mathematics and Science, study resources for Grades 10 to 12, easy access to the website of the University of South Africa (UNISA) and other learning-oriented information such as skills development and courses for success. These are all available at no cost to the user and can be viewed and completed in their own time.

3.4.2.2 Wi-Fi Jobs and Wi-Fi Entrepreneur

As the literature review indicated, South Africa faces a high unemployment rate compared to other countries. Unemployment is linked to poverty, although being employed does not necessarily suggest that a person is not living in poverty. The effect of unemployment and poverty can easily dim the hope of the future for the youth of this country.

According to Statistics South Africa (2016: xv), the unemployment rate within the City of Tshwane is 25,1%. Compared to the other metropolitan municipalities, the City of Cape Town and eThekwini Municipality are the only two municipalities who scored less than the City of Tshwane with a score of 23% and 19,7% respectively. These figures were calculated in the quarterly labour force survey, which provides statistical data between April and June 2016. During January to May 2016, the City of Tshwane's unemployment rate was 26%, indicating a positive change in the second quarter.

Seeking employment or pursuing to start a business can often be daunting, especially for individuals in low-income communities who have limited access to information or to relevant resources that would be necessary in order to take the first action steps. The content pages related to Wi-Fi Jobs and Wi-Fi Entrepreneur are specifically created in a manner to inform and guide a user through a process of either seeking employment or starting a new business.

On the Wi-Fi Jobs content page, fundamental information and templates are provided to firstly assist a user in developing a Curriculum Vitae, which is essential when applying for jobs. Secondly, the various applications on the content page allow for the user to upload their Curriculum Vitae for career seekers to preview, or to apply for a suitable career opportunity online. It includes an online candidate management and job linkage portal which is specially designed for the unemployed youth, providing job opportunities ranging from entry level or unskilled candidates to skilled, experienced individuals. Thirdly, the content page includes guidelines in order to assist a user to adequately prepare for a professional job interview.

The Wi-Fi Entrepreneur content page is geared at assisting an individual to start, maintain and expand a small business. It includes four main tools which can easily be accessed and provides a user-friendly experience. Although most of the material within this content page is free, there are free trial periods available to introduce the user to the tools, but as soon as the free trial period expires, the user will have to pay for further use.

The four main tools include:

1. FinFind: A South African guide to small business funding.
2. SMEasy: An online, easy to use accounting and business management solution.
3. AdminEasy: Six free videos to assist a user in setting up and maintaining a simple recordkeeping system for his or her business.
4. SocialEasy: This is a convenient tool that allows users to update all their social network platforms at once, decreasing time spent on marketing.

3.4.2.3 Government Resources

The literature review focused on the importance of public participation and the necessity of a municipality to strategically consider its approach in this regard. Public participation strengthens the relationship between local government and citizens. Therefore, creating a convenient and simple platform where citizens can engage with government might encourage citizens to participate more actively.

The City of Tshwane succeeded in designing their online website in such a way that it is convenient for citizens to complete online tasks where in the past they had to physically visit the municipality or other service centres. This service is referred to as 'e-Tshwane', which the City believes increases capacity and demonstrates willingness to deploy ICT. The deployment of ICT improves access to knowledge and information in order to establish a service relation with citizens, businesses and other government branches (City of Tshwane, 2016:1). The latter supports their actions towards their goals towards a liveable, resilient and inclusive city and one which offers a high-quality life to their citizens.

On the Tobetsa platform, created by Project Isizwe, access to the e-Tshwane service is convenient and simple. Furthermore, on the Tobetsa platform, in the section on government resources, citizens can easily engage by making use of the online links to several services, such as procurement processes, volunteer opportunities or becoming a home owner. Other links include, but are not limited to the City's Wi-Fi Voice, Wi-Fi Chat or Wi-Fi Champions, which present opportunities for citizens to voice their opinions on matters related to the City or to promote the Wi-Fi service to other citizens.

3.5   Summary

The unique partnership between the City of Tshwane and Project Isizwe illustrates an innovate initiative to bridge the digital divide through a cost-effective solution, and positively impacting the citizens of the City. Whilst the partnership works towards their specific vision statements and goals, they are not only making headway towards their envisioned success, but improving other areas such as the triple challenge of poverty, unemployment and inequality.

Providing Wi-Fi to the end-user at no direct cost, has been the vision from the start of Project Isizwe. After only three years, the growth in the number of FIZs, the expected increase in new active users, and the increase in speed and lower costs have created widespread support, not only Project Isizwe and the City of Tshwane, but have won the Wireless Broadband Alliance's Global Award for the most innovative City or Government Programme to bridge the digital divide in 2016.

In terms of finding and maintaining a cost-effective solution to provide the service, Project Isizwe had to establish partnerships with other companies, such as Neotel and Herotel in order to assist them in reaching the desired outcomes. These partnerships have not only been successful due to the shared vision, but also due to the sharing of knowledge, skills and a mutual trust which exists between the parties.

Project Isizwe is committed to a long-term partnership with the City as they believe this approach of working with local government showcases the feasibility of relationship building that is necessary to expand this initiative and establish more areas in South Africa online.

4. CHAPTER 4: Research Methodology and Findings

4.1 Introduction

Chapter 3 discussed how the City of Tshwane engaged with Project Isizwe to create an innovative initiative to bridge the digital divide. The project's main objective is to bring the internet to people across South Africa. This chapter focuses on the research methodology that was used in the study and provides statistics and a written explanation of the Wi-Fi user's behaviour and preferences. The chapter concludes with a discussion on the findings.

4.2 Research Methodology

The research methodology of this study consisted of three parts. The first part consisted of an extensive literature study which explored various regulatory documentation, relevant statistical data to prove the state of connectivity within South Africa and globally, as well as other literature in the digital field which laid the foundation for this study. The second part of the research methodology which forms part of the qualitative research component, are the personal interviews, which were conducted with the Wi-Fi project manager of the City of Tshwane and the CEO of Project Isizwe to establish the nature, purpose and implementation of their collaborative initiative.

The last part of the research methodology and which also forms part of the qualitative research component, consisted of the completion of questionnaires that were completed by the Wi-Fi users at five pre-selected Wi-Fi service sites. The questionnaires were randomly handed out to ten users at each site. It contained seven questions with the purpose to gain information about the person's age, gender, travel time, awareness of the Wi-Fi service. It also set out to determine the participant's Wi-Fi usage behaviour in terms of the amount of time spent on the service per week, their reasons for using the service and lastly, to determine the impact of the service on their lives.

4.3   Findings

The following section will explore the five research sites that were visited in order to conduct the questionnaires. At each site, ten participants were required to complete the questionnaire. The sites were geographically dispersed within the City of Tshwane.

### 4.3.1   Site 1: The Union Building

Known for its architectural significance, the Union Building is the official seat of the National Government of South Africa and houses the Office of the President. The FIZ is set up in the large garden in front of the Union Building. The significance of choosing this site is the fact that it is situated within the city centre, creating easy access for a large number of people.

Table 4.1: The Union Building

Average age	26,3
Total females	1
Total males	9
Average use per week (in days) per user	3,9

As indicated above in Table 4.1, the average age of the group indicates that they are relatively young adults who use the Wi-Fi service at the Union Building, although this site scored the oldest average in age of all five sites. The youngest participant was 21 years of age and the oldest 35 years of age. Only one female participant took part in the study, while nine male participants took part. As mentioned earlier, the surveys were handed out at random and not based on gender, race, age or any other criteria. It is clear that more men were in the gardens of the Union Building at the time of the survey, which was conducted between 11:15 and 12:15 in the afternoon. The average number of days this site is accessed per week, per user was 3,9 days. The minimum days of usage per week by two participants was one day, while one participant used the Wi-Fi service seven days per week.

The following figures provide insight to the Wi-Fi users' awareness of the Wi-Fi service, their travel time to the closest Wi-Fi service and the general purpose for using the service at the Union Buildings.

Figure 4.1: Awareness of Wi-Fi Service – Union Building
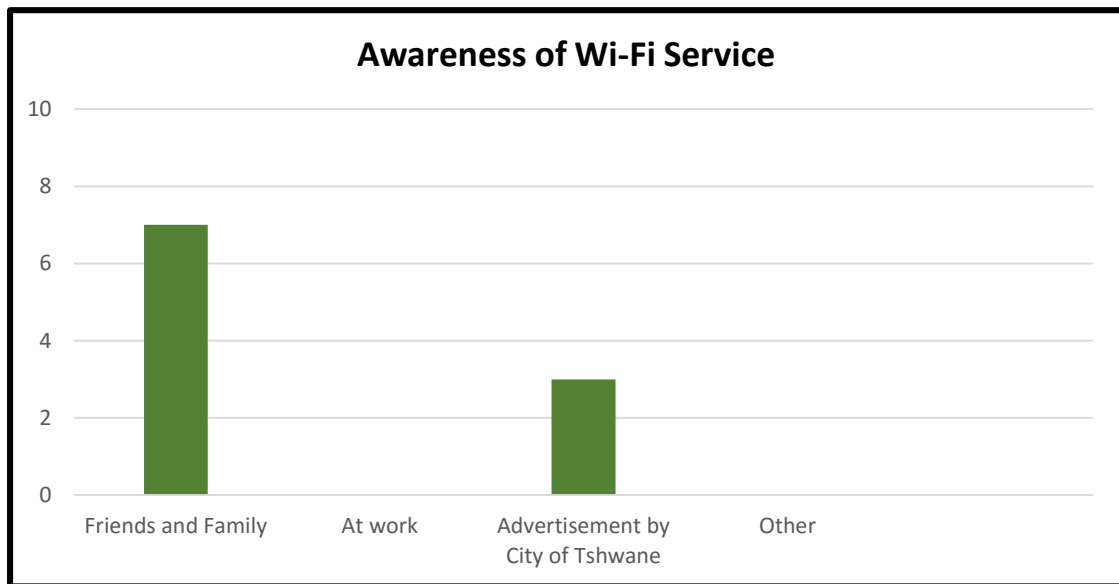
In order to address the fourth objective as stated in chapter 1, Figure 4.1 seeks to establish how the participants became aware of the Wi-Fi service. The findings will assist the City of Tshwane and Project Isizwe when reviewing their marketing strategy. As indicated in Figure 4.1, three participants became aware of the Wi-Fi service through official advertising by the City of Tshwane.

Figure 4.2: Travel time – Union Building
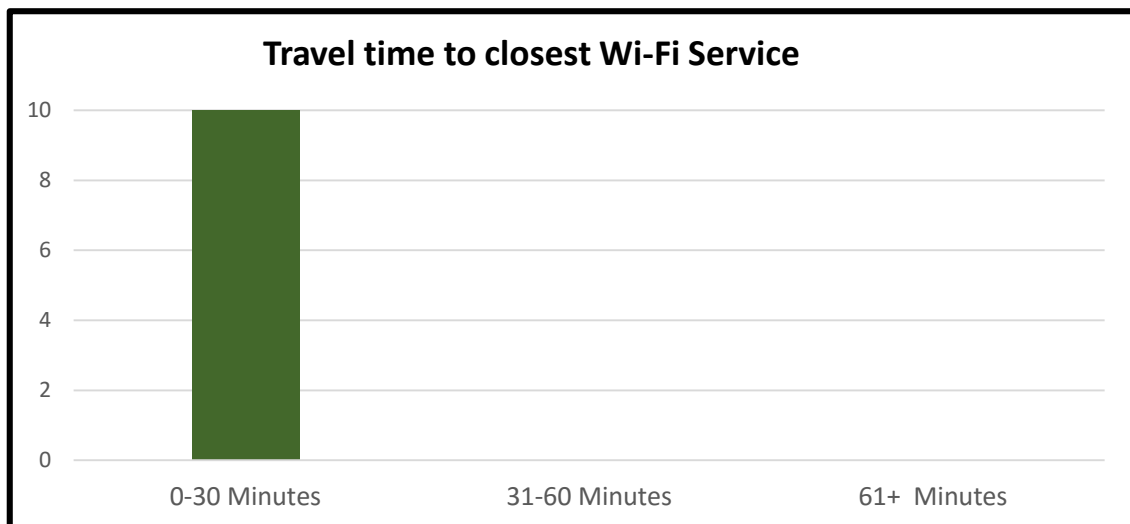
In order to address the fourth objective as stated in chapter 1, Figure 4.2 seeks to establish the average travel time of participants to reach the nearest Wi-Fi service. This will assist the City of Tshwane and Project Isizwe to ensure that

the hotspots are placed strategically in order to minimise travel time to and from the hotspots. As indicated in Figure 4.2, all ten participants are able to reach the nearest hotspot within 30 minutes.
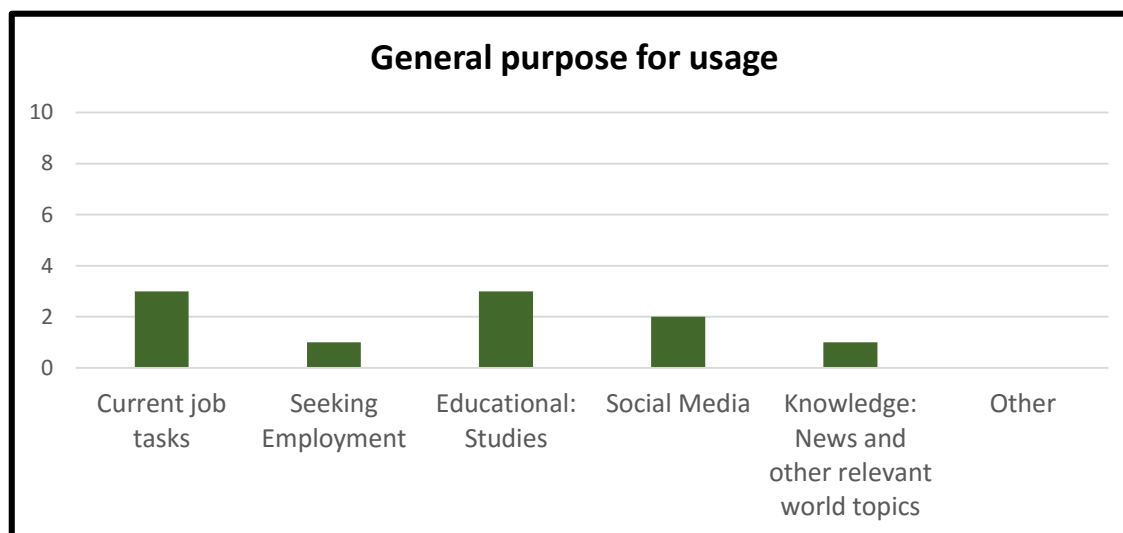
Figure 4.3: General purpose for usage – Union Building

In order to address the fourth objective as stated in chapter 1, Figure 4.3 seeks to establish the general purpose of the use of the Wi-Fi service by each participant. This will assist Project Isizwe when reviewing the Tobetsa Platform as content could be improved to assist participants. As indicated in Figure 4.3, the Wi-Fi service at the Union Building is mostly used for current job tasks and educational purposes.

4.3.2   Site 2: Mahatma Ghandi Bus Station

In 2014, the City of Tshwane launched South Africa's largest Bus Rapid Transit (BRT) system at the Mahatma Ghandi Bus Station. This transit system is better known as A Re Yeng, meaning 'connecting the capital' (Centurion Rekord, 2014:1). The significance of choosing this site was the fact that it is a popular bus station and well situated within the City, therefore many people who are waiting at the station are able to use the Wi-Fi service. The FIZ is deployed opposite the bus stop.

Table 4.2: Mahatma Ghandi Bus Station

Average age	26
Total females	3
Total males	7
Average use per week (in days) per user	3,5

As indicated above in Table 4.2, the average age indicates also young adults using the Wi-Fi service at this site, scoring the second oldest average age out of the five sites. The youngest participant was 18 years of age and the oldest 52 years of age. This site had the largest difference between the youngest and the oldest participant. There were three female participants that took part in the study, while seven male participants took part. It was evident that more men were at the bus station during the time of the survey, which took place between 12:30 and 13:00 in the afternoon. The average number of days on which the site was accessed per week, per user was 3,5 days, which is the lowest average of all the sites. The minimum days of use per week by two participants were 2 days, while only one participant used the Wi-Fi service 7 days per week.

The following figures provide insight to the Wi-Fi users' awareness of the Wi-Fi service, their travel time to the closest Wi-Fi service and the general purpose for using the service at Mahatma Ghandi Bus Station.

Figure 4.4: Awareness of Wi-Fi Service - Mahatma Ghandi Bus Station
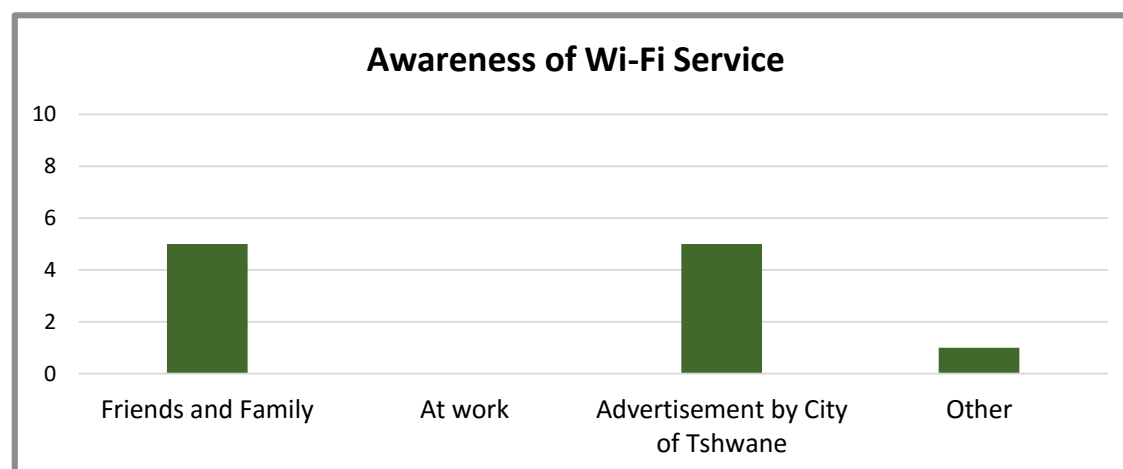
In order to address the fourth objective as stated in chapter 1, Figure 4.4 seeks to establish how the participants became aware of the Wi-Fi service. The

findings will assist the City of Tshwane and Project Isizwe when reviewing their marketing strategy. As indicated in Figure 4.4, five participants became aware of the Wi-Fi service through official advertising by the City of Tshwane.

Figure 4.5: Travel time to closest Wi-Fi Service - Mahatma Ghandi Bus Station
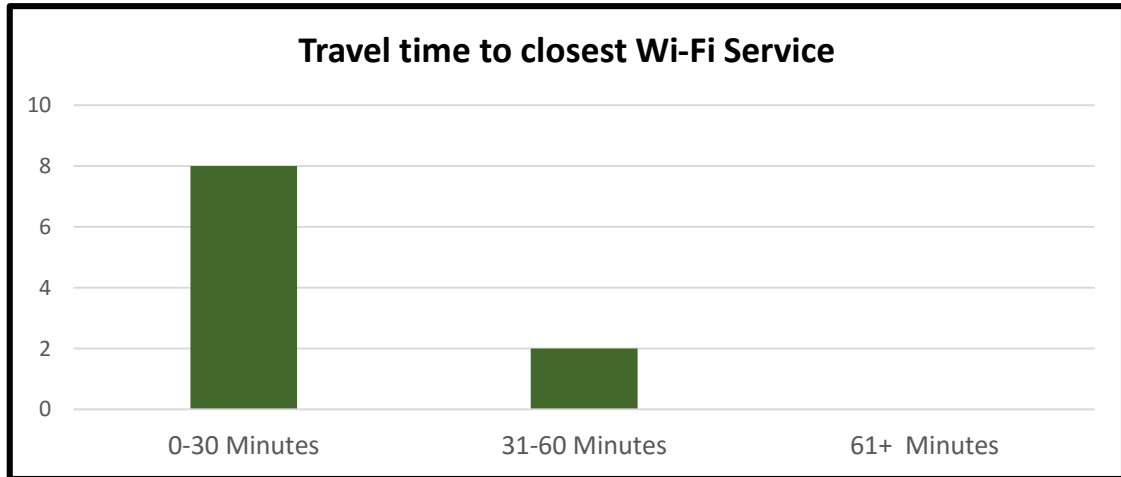
In order to address the fourth objective as stated in chapter 1, Figure 4.5 seeks to establish the average travel time of participants to reach the nearest Wi-Fi service. This will assist the City of Tshwane and Project Isizwe to ensure that the hotspots are placed strategically in order to minimise travel time to and from the hotspots. As indicated in Figure 4.5, eight participants are able to reach the nearest hotspot within 30 minutes while two participants are required to travel between 31-60 minutes.

Figure 4.6: General purpose for usage- Mahatma Ghandi Bus Station
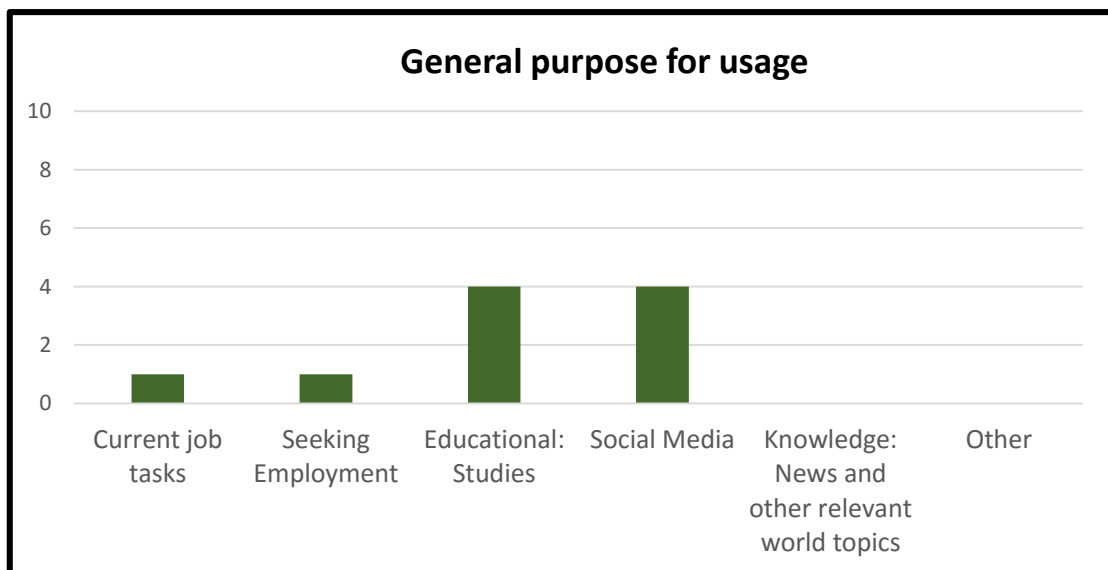
In order to address the fourth objective as stated in chapter 1, Figure 4.6 seeks to establish the general purpose of the use of the Wi-Fi service by each participant. This will assist Project Isizwe when reviewing the Tobetsa Platform as content could be improved to assist participants. As indicated in Figure 4.6, the Wi-Fi service at Mahatma Ghani Bus Station is mostly used for educational purposes as well as for social media.

4.3.3   Site 3: Rev JM Buthane Community Library

This site is a community library situated within the western part of the township of Mamelodi, on the north-eastern skirts of Pretoria. The population is estimated at one million people, while the township is known for its poverty-stricken situation, high unemployment rate and other socio-economic problems (Mamelodi Trust, 2016:1). The significance of choosing this site was to include a rural area with a lower income population. The FIZ is situated outside the library.

Table 4.3: Rev JM Buthane Community Library

Average age	25,8
Total females	1
Total males	9
Average use per week (in days) per user	4,6

As indicated above in Table 4.3, the average age proved to be younger than the participants at both the Union Building and at Mahatma Ghandi Bus Station. The youngest participant was 18 years of age and the oldest 35 years of age. There was only one female participant that took part in the study, while nine male participants took part, similar to the gender ratio at the Union Building and Ruth Mompati Bus Station (Site 5, discussed in par. 4.3.5). It was evident that more men were in the library during the time of the survey, which took place between 13:30 and14:00 in the afternoon. The average number of days on which the site is accessed per week, per user was 4,6 days, which is the second highest usage of all five sites. The minimum days of usage per week by one

participant were 3 days, while one participant used the Wi-Fi service 6 days per week.

The following figures provide insight to the Wi-Fi users' awareness of the Wi-Fi service, their travel time to the closest Wi-Fi service and the general purpose for using the service at Rev JM Buthane Community Library.

Figure 4.7: Awareness of Wi-Fi Service - Rev JM Buthane Community Library
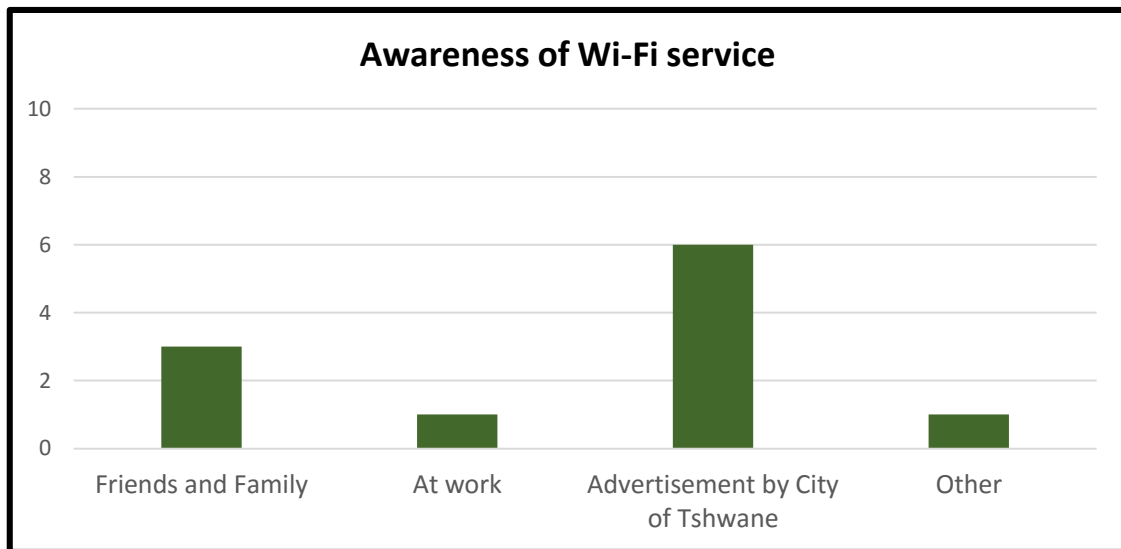
In order to address the fourth objective as stated in chapter 1, Figure 4.7 seeks to establish how the participants became aware of the Wi-Fi service. The findings will assist the City of Tshwane and Project Isizwe when reviewing their marketing strategy. As indicated in Figure 4.7, six participants became aware of the Wi-Fi service through official advertising by the City of Tshwane.

Figure 4.8: Travel time to nearest Wi-Fi Service - Rev JM Buthane Community Library
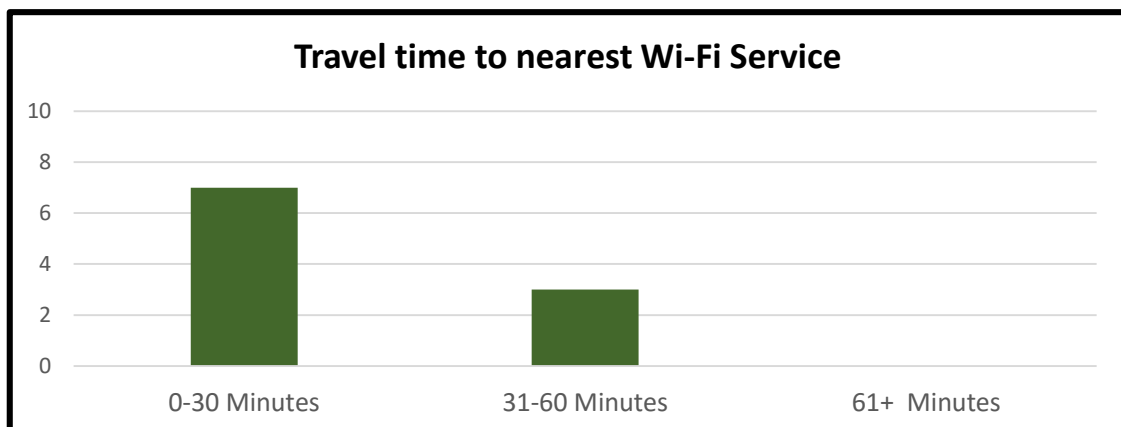
In order to address the fourth objective as stated in chapter 1, Figure 4.8 seek to establish the average travel time of participants to reach the nearest Wi-Fi service. This will assist the City of Tshwane and Project Isizwe to ensure that the hotspots are placed strategically in order to minimise travel time to and from the hotspots. As indicated in Figure 4.8, seven participants are able to reach the nearest hotspot within 30 minutes while three participants are required to travel between 31-60 minutes.

Figure 4.9: General purpose for usage - Rev JM Buthane Community Library

In order to address the fourth objective as stated in chapter 1, Figure 4.9 seeks to establish the general purpose of the use of the Wi-Fi service by each participant. This will assist Project Isizwe when revi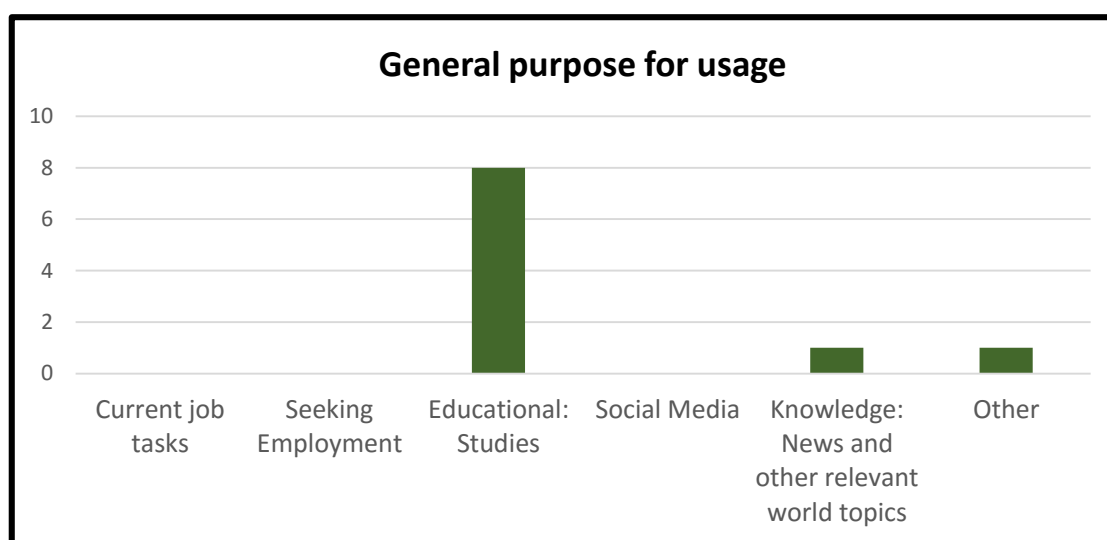ewing the Tobetsa Platform as some content could be improved to assist participants. As indicated in Figure 4.9, the Wi-Fi service at Rev JM Buthane Community Library is mostly used for educational purposes.

The 'other' in Figure 4.7 was referred to by the participants as 'study' and in Figure 4.9, the participant indicated SMME Development.

4.3.4   Site 4: Stanza Bopape Community Library

Also, situated within Mamelodi, this library is found on the eastern part of the township. There is an information technology centre on the premises, which jointly operates with the library. The rationale behind choosing this site was that Mamelodi's population is estimated at a million residents (Mamelodi Trust,

2016:1), including many young people and one library would not have been adequate to gather enough data, hence a second one was chosen. The FIZ is also situated outside the library.

Table 4.4: Stanza Bopape Community Library

Average age	23,5
Total females	2
Total males	8
Average use per week (in days) per user	4,7

As indicated above in Table 4.4, the average age proved to be younger than the participants at the Union Building, at Mahatma Ghandi Bus Station and at the Rev JM Buthane Community Library, but older than at the Ruth Mompati Bus Station. The youngest participant was 19 years of age and the oldest 29 years of age. This is the smallest difference in age when all the sites are compared. There were eight male participants that took part in the study, while two females participants took part. It is clear that more men were in the library during the time of the survey, which took place between 15:00 and 15:30 in the afternoon. The average number of days on which a site is accessed per week, per user was 4,7 days, which is the highest average when all the sites are compared. The minimum days of usage per week by three participants were 4 days, while seven participants used the Wi-Fi 5 times per week.

The following figures provide insight into the Wi-Fi users' awareness of the Wi-Fi service, their travel time to the closest Wi-Fi Service and the general purpose for using the service at Stanza Bopape Community Library.

Figure 4.10: Awareness of Wi-Fi Service - Stanza Bopape Community Library
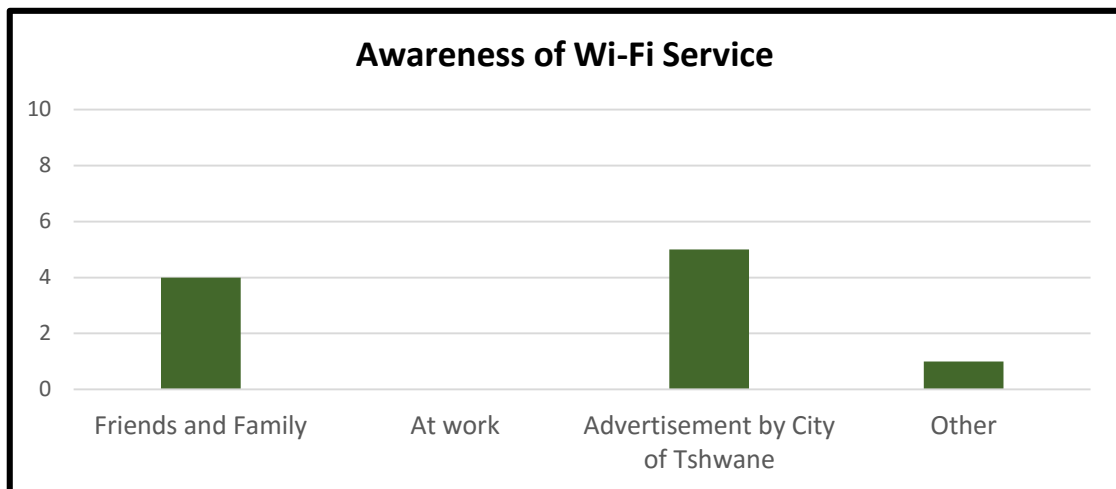
In order to address the fourth objective as stated in chapter 1, Figure 4.10 seeks to establish how the participants became aware of the Wi-Fi service. The findings will assist the City of Tshwane and Project Isizwe when reviewing their marketing strategy. As indicated in Figure 4.10, five participants became aware of the Wi-Fi service through official advertising by the City of Tshwane.

Figure 4.11: Travel time to nearest Wi-Fi service - Stanza Bopape Community Library
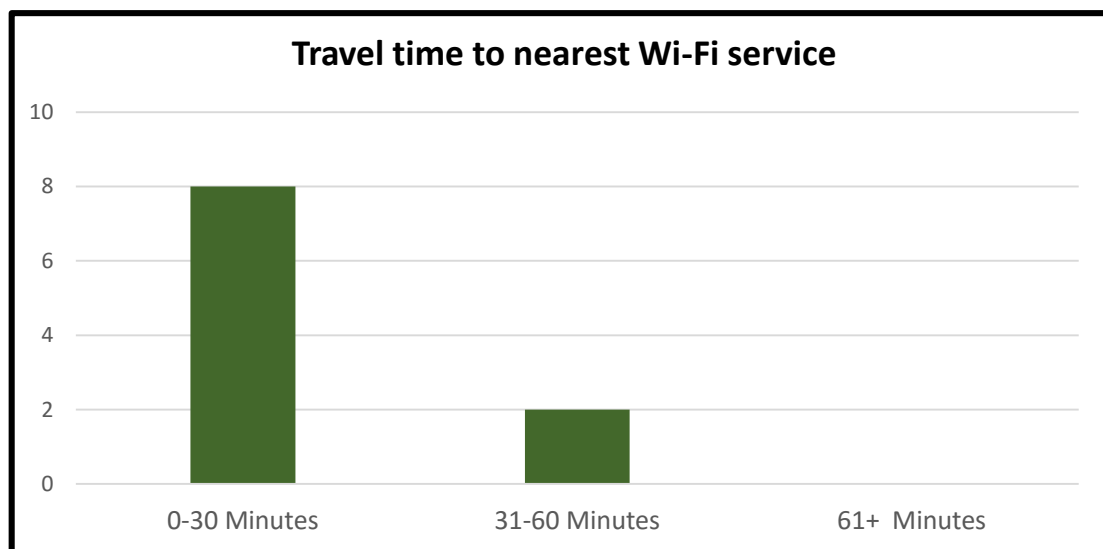
In order to address the fourth objective as stated in chapter 1, Figure 4.11 seek to establish the average travel time of participants to reach the nearest Wi-Fi service. This will assist the City of Tshwane and Project Isizwe to ensure that the hotspots are placed strategically in order to minimise travel time to and from

the hotspots. As indicated in Figure 4.11, eight participants are able to reach the nearest hotspot within 30 minutes while two participants are required to travel between 31-60 minutes

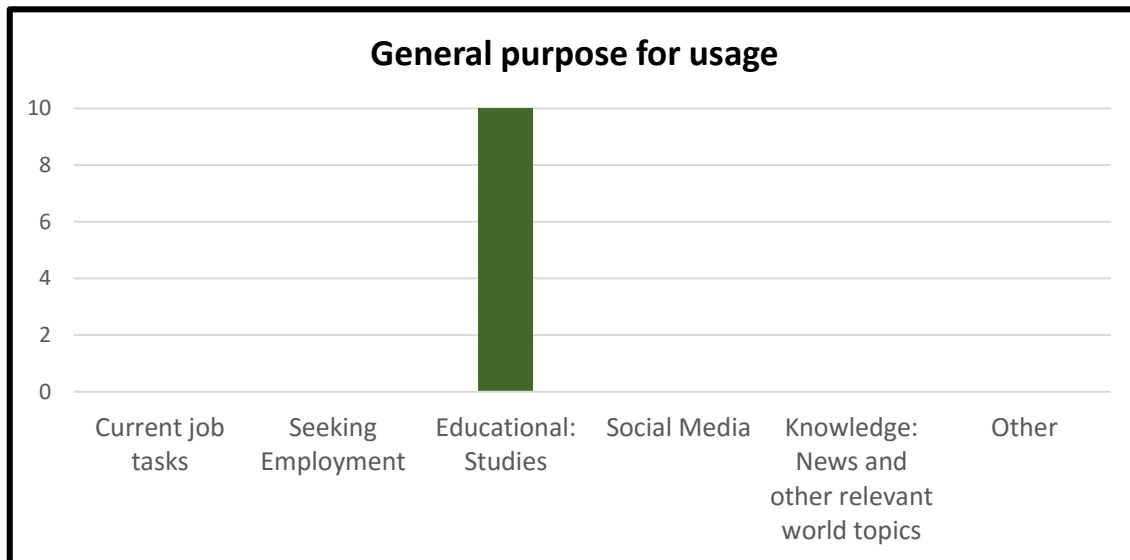**Figure 4.12: General purpose for usage- Stanza Bopape Community Library**

In order to address the fourth objective as stated in chapter 1, Figure 4.12 seeks to establish the general purpose of the use of the Wi-Fi service by each participant. This will assist Project Isizwe when reviewing the Tobetsa Platform as content could be improved to assist participants. As indicated in Figure 4.12, the Wi-Fi service at Stanza Bopape Community Library is mostly used for educational purposes.

The 'other' in Figure 4.12 was referred to by the participants as 'library'.

4.3.5 Site 5: Ruth Mompati Bus Station

The last site, which is another bus station, was chosen after the positive data and feedback received at Mahatma Ghandi Station. The FIZ is situated across the area of the bus station in order for Wi-Fi users to connect to the service on different sides of the bus stop.

Table 4.5:   Ruth Mompati Bus Station

Average age	22,8
Total females	1
Total males	9
Average use per week (in days) per user	4,6

As indicated above in Table 4.5, the average age proved to be youngest of all the five sites which were chosen. The youngest participant was 20 years of age and the oldest 32 years of age. There was only one female participant that took part in the study, while nine male participants took part. This gender ratio is similar to the Union Building and Rev JM Buthane Community Library. It is clear that more men than women were at the bus station during the time of the survey, which took place between 16:30 and 17:15 late afternoon. The average use at this site is 4,6 days per week, which is similar to Rev JM Buthane Community Library, 0,7 and 1,1 more than the sites at the Union Buildings and the Mahatma Ghandi Bus Station, but 0,1 less than at the Stanza Bopape Library. The minimum days of usage per week by three participants was 3 days, while two participants used the Wi-Fi 7 times per week.

The following figures provides insight to the Wi-Fi users' awareness of the Wi-Fi service, their travel time to the closest Wi-Fi Service and the general purpose for using the service at the Ruth Mompati Bus Station.

Figure 4.13: **Awareness of Wi-Fi Service - Ruth Mompati Bus Station**
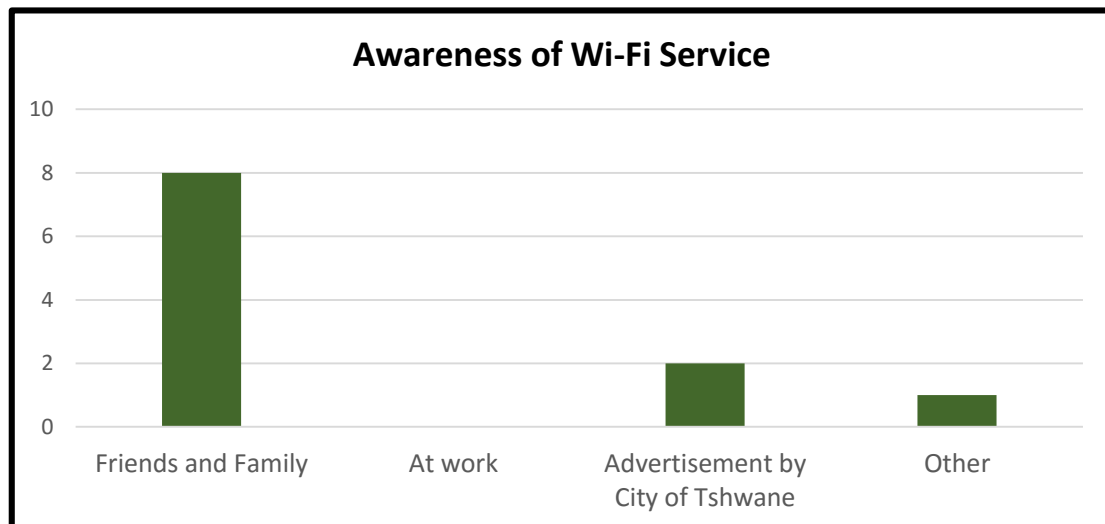
In order to address the fourth objective as stated in chapter 1, Figure 4.13 seeks to establish how the participants became aware of the Wi-Fi service. The findings will assist the City of Tshwane and Project Isizwe when reviewing their marketing strategy. As indicated in Figure 4.13, two participants became aware of the Wi-Fi service through official advertising by the City of Tshwane.

The 'other' in Figure 4.13 was not specified by the participant.

Figure 4.14: Travel time to nearest Wi-Fi Service - Ruth Mompati Bus Station

In order to address the fourth objective as stated in chapter 1, Figure 4.14 seek to establish the average travel time of participants to reach the nearest Wi-Fi service. This will assist the City of Tshwane and Project Isizwe to ensure that the hotspots are placed strategically in order to minimise travel time to and from the hotspots. As indicated in Figure 4.14, nine participants are able to reach the nearest hotspot within 30 minutes while one participant is required to travel between 31-60 minutes.
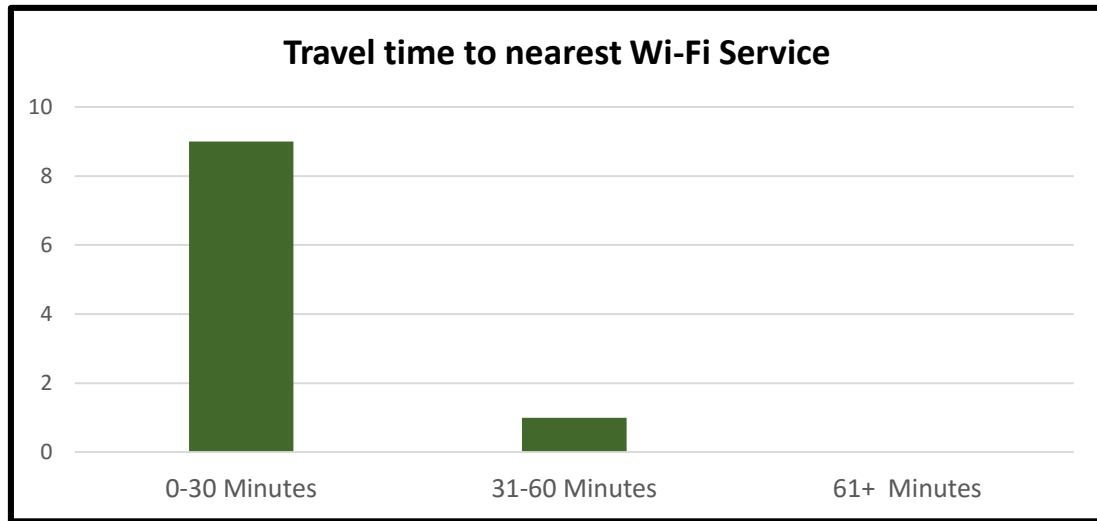
Figure 4.15: General purpose for usage - Ruth Mompati Bus Station
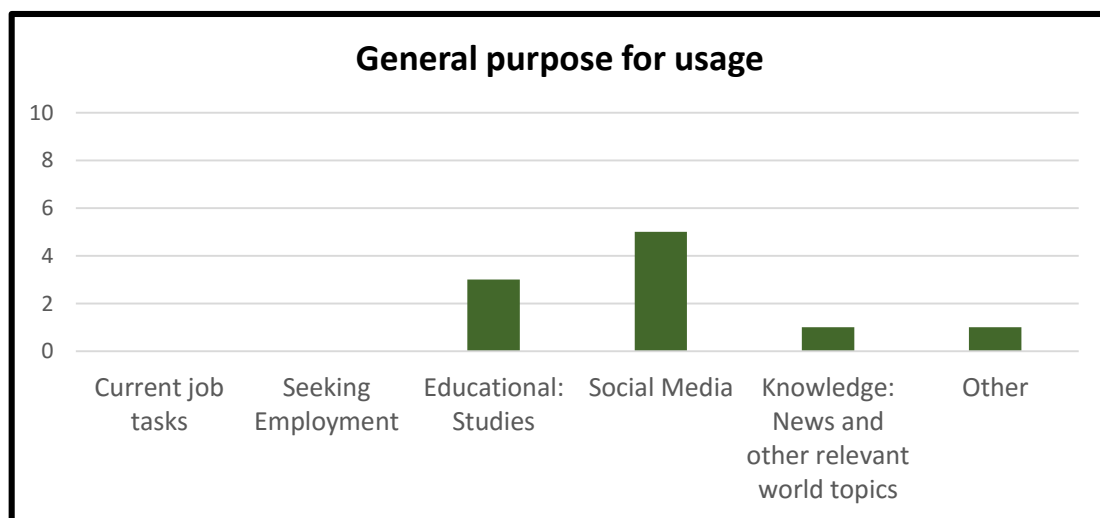
In order to address the fourth objective as stated in chapter 1, Figure 4.15 seeks to establish the general purpose of the use of the Wi-Fi service by each

participant. This will assist Project Isizwe when reviewing the Tobetsa Platform as content could be improved to assist participants. As indicated in Figure 4.15, the Wi-Fi service at Ruth Mompati Bus Station is mostly used for social media.

The 'other' in Figure 4.15 was not specified by the participant.

4.3.6   Average analysis of all 5 sites

Table 4.6:   **Average analysis of all five sites**

Average age	25
Total females	8
Total males	42
Average use per week (in days)	4,26

It is evident that more males than females participated in the study; a total of 42 males and 8 females participated. There could be various factors which had an influence on these numbers and will be explored towards the end of this chapter.

The average age of all the participants is 25 years. A correlation can be drawn between the age group seen in Figure 4.6 and the general purpose for using the Wi-Fi service as seen in Figure 4.18. The most post popular use is for educational purposes (28 participants) and social media (11 participants). Only 4 participants indicated that they use the Wi-Fi service for work-related matters, while 2 stated that they use the service to seek employment. Knowledge around relevant topics and world news were selected by 3 participants, while 2 participants indicated 'other' which was noted as "SMME Development" and one participant did not specify the purpose.

Figure 4.16: Awareness of Wi-Fi Service – all five sites
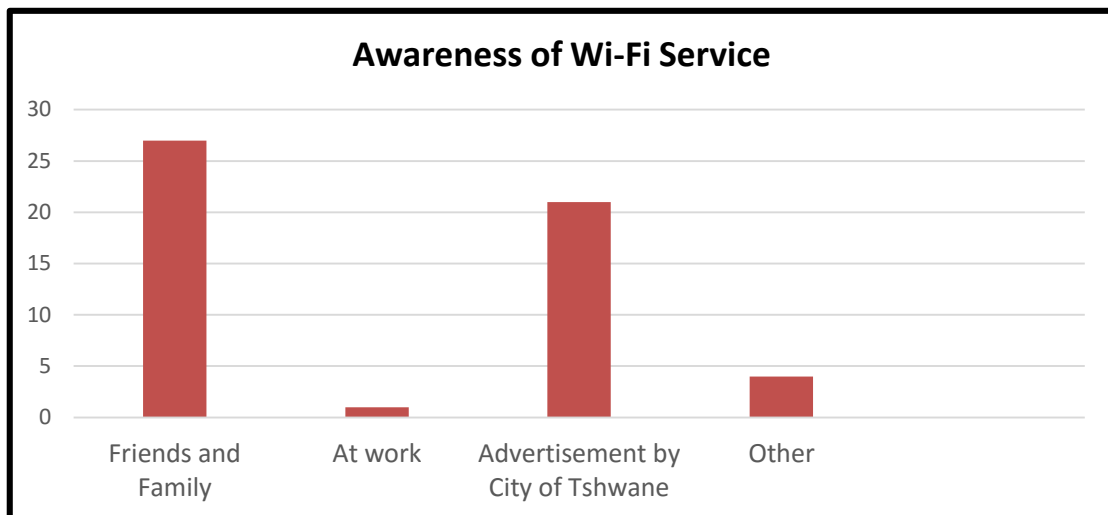
The most popular way in which the participants became aware of the service was through friends and family (27 participants), and secondly through advertisements by the City of Tshwane (21 participants). This is a worthwhile indication for the city's marketing team to determine whether they are reaching their target audience or not.

Figure 4.17: Travel time to nearest Wi-Fi Service – all five sites
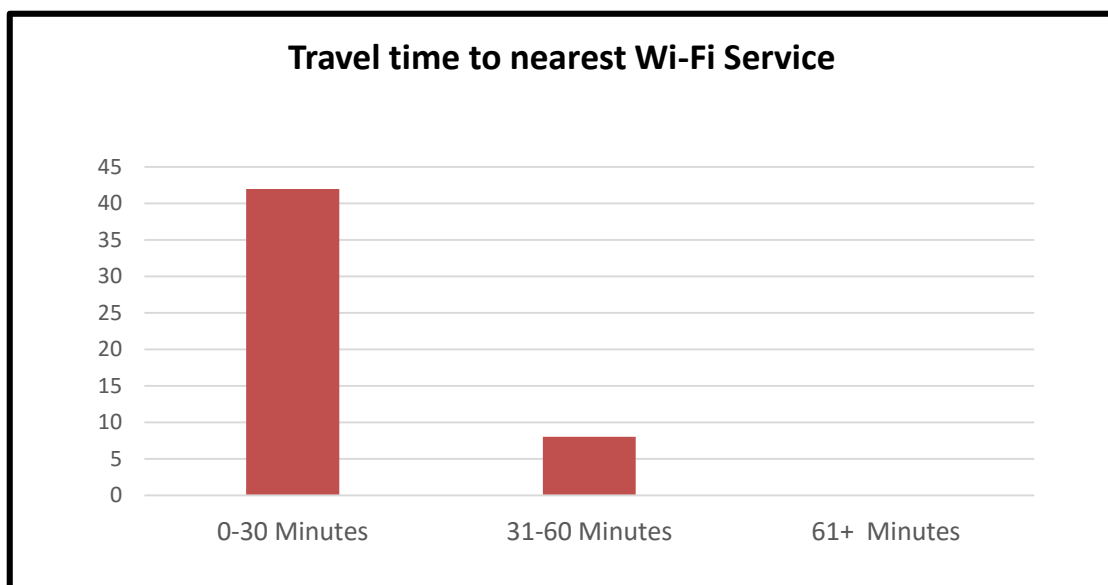
There were only 8 participants who indicated that their travel time was 31-60 minutes to the nearest Wi-Fi service, while the other 42 participants only needed to travel 0-30 minutes. The questionnaire unfortunately did not allow for specifying the type of transport the participants used. However, the fact that no

participant indicated a travel time longer than 60 minutes, is a valuable indication with regards to the dispersion of the Wi-Fi service around the city.

Figure 4.18: General purpose for usage – all five sites
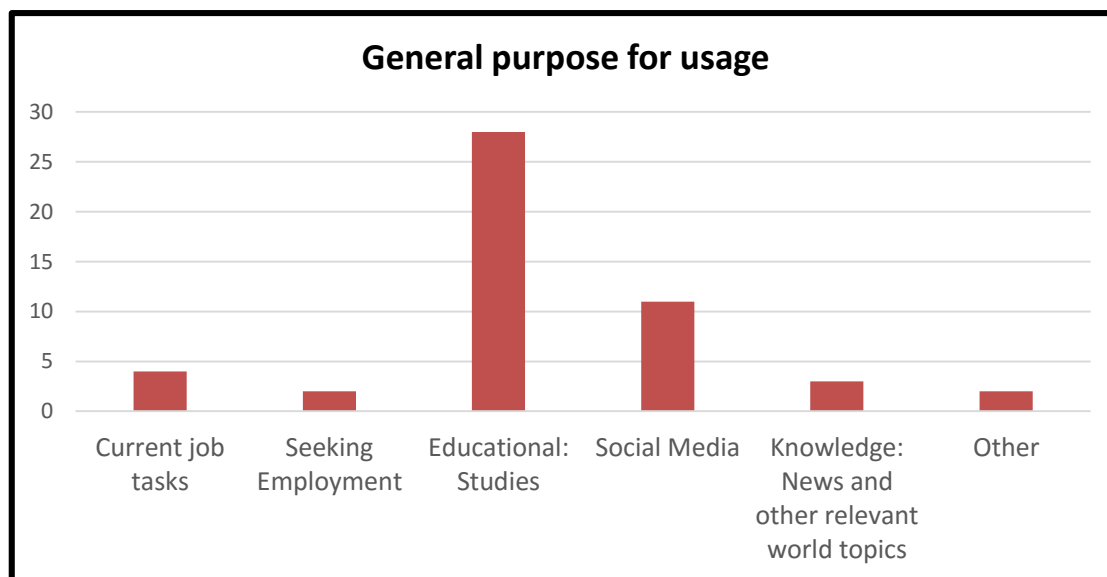
An interesting and predicted scenario is that of the participants who were in the two libraries at the time of the study, 8 out of the 10 participants at the JM Buthane Community Library and all 10 participants at Stanza Bopape Community Library indicated that they use the Wi-Fi service mostly for educational purposes. Participants at the Mahatma Ghandi Bus Station used the service for educational purposes (4 participants) and social media (4 participants). Social media dominated at the Ruth Mompati Bus Station (5 participants), while educational purposes were selected by only 3 participants.

4.3.7   Personal Impact of Wi-Fi Service

With reference to Appendix C, as part of the questionnaire, participants were asked to express the personal impact that the Wi-Fi service have had on their lives. Fourteen out of the fifty participants indicated that it either saves them money to use the public Wi-Fi service spot or when they run out of data, it is convenient to connect to the service. Twenty out of the fifty participants indicated that the Wi-Fi service have assisted them in some way to support their educational needs. This included research assignments, completing of online assignments, access to e-mails for school purposes and downloading necessary documentation. It was clear that users at the library were mostly

using the service for educational or work purposes while participants at the bus stations used it to stay updated with local and international affairs or to browse the internet in general. Only one participant in the study noted that they use the Wi-Fi service to stay connected with the online social society.

4.3.8   Discussion

The following section will elaborate on the findings as illustrated in the previous section. In order to address objective three and four of this thesis, two main themes will be discussed related to gender inequalities, awareness and engagement of the service.

4.3.8.1   Gender difference among Wi-Fi Users

As noted in the findings, the gender ratio between the Wi-Fi users is significant. There were 42 males and 8 females who participated in the research. In a study conducted by the United Nations on doubling digital opportunities, the current evidence indicates that women and girls do not have equal access to the internet and are therefore left behind. This hinders society's ability to unlock the full potential of new digital opportunities (Broadband Commission Working Group, 2013:21).

According to the report, the three major factors contributing to this challenge is affordability, accessibility and appropriateness of meaningful content. In terms of these factors, there are still income gaps between men and women, which influence the buying power of women to access ICTs. Illiteracy inhibits access to the internet and poses further challenges for women. Across all developing countries, only 75% of women are literate, compared to 86% of men (Broadband Commission Working Group, 2013:21). The reality of accessing and utilising the internet will remain out of reach for women if resources are not allocated to improve their ICT skills.

With reference to the third objective of this thesis, namely to establish policy documentation that supports technological inclusivity and advancement within local government in South Africa, it is observed through the findings that women

are not technologically inclusive at the same level as men. Chapter 5 will elaborate on this section.

4.3.8.2   Awareness and Engagement

The findings indicated that users became aware of the Wi-Fi service through firstly, friends and family (27 participants) and secondly, advertisements by the City of Tshwane (21 participants). The research questions did not allow for a participant to provide an answer on where the friends or family heard about the service. This information could potentially have indicated whether the trend of awareness of the service is through word of mouth, or through the marketing strategy adopted by the city.

However, the fact that only 21 participants out of the 50 participants became aware of the service through advertisements by the city, is an indication that the current marketing strategy is reaching less than 50% of the citizens, as derived from the study's sample. This influences the number of users that the network has made provision for, hence the full capacity of the network has not been reached. As discussed in chapter 2, the number of people who are connected to the internet should dramatically increase if positive progress is to be made in order to bridge the digital divide. The initiative of the City of Tshwane and Project Isizwe could be more effective if all the users for whom the service is intended, are aware of it and engage with the service on a regular basis.

The advertising strategy of the City of Tshwane for this specific initiative was done by Retrolex, an integrated communications consultancy. During the previous financial year, 2015, they have experienced, as this research finding also show, low levels of awareness, that the customer journey is not simple and the branding is not sufficiently visible.

The approach of Retrolex to improve on these observations entails the following:

Figure 4.19: Retrolex Advertising Approach

Brand Architecture	**Simplify Customer Journey**	**Promote Access**
• Bring greater Tshwane ownership • Revise brand architecture inclusive of value added services	• White labelled portal with one access point • Revise brand architecture inclusive of value added services	• Billboard advertising • Print advertising • Public relations
Increase Visibility at Hotspots	**Drive Engagement**	**Increase Reach and Engagement**
• Branding • Activations	• Ambassadors	• Social campaign

Source: (Retrolex, 2015:4).

As shown in Figure 4.19, in terms of the branding architecture, the strategy was to ensure a brand which can be owned, recognised as Tshwane-relevant and can serve as an umbrella for value added services. The Tobetsa platform should be re-skinned and become the first point of entry after connection is established. This will ensure that users are aware of the unlimited data services available to them. The approach was further to spread the word, inform the public regarding the positive progress that have been made and to sell the product differentiations which included video content, the Tobetsa platform,

newspapers and billboards. According to Retrolex (2015:9-12), the last suggestion was to appoint ambassadors who should drive engagement and usage while a social campaign should be created to increase reach and engagement.

The strategy of the City for the next two years is to brand FIZs for greater visibility, to educate people about the value-added services and to illustrate the ease to connect to the Wi-Fi. The city will also rely heavily on public relations and social media as a means to spread the word (Kamffer, 2016:1).

Based on the current visible public advertising, the researcher observed that the adopted strategy, presented by Retrolex, has the following shortcomings:

1. The City made use of their official website to advertise the Wi-Fi service, but a user will not be aware of the marketing done online if they have no means of connecting to the internet.
2. The majority of the advertising is done through posters. Although this is a cost-effective and efficient medium of advertising, it creates challenges that should be addressed beforehand, namely:
   - language appropriateness used on the posters should be taken into account in the area where the posters are deployed;
   - posters are not appropriate for visually impaired people;
   - by deploying posters, the assumption is that people will be able to read the information, however illiteracy should be considered and pictures might be an alternative to describe the service;
   - the place of deployment is an important factor as it should be clearly visible when walking or driving past;
   - important information, such as instructions to connect to the service, the assurance of protection of personal details and where the various sites within the area are should be included on the posters.

Recommendations based on the findings of the City of Tshwane's marketing strategy will be made in Chapter 5.

4.4   Summary

Chapter 4 focused on the research methodology that was used in the study and graphically illustrated the data that were gathered through questionnaires at the five various research sites. A discussion of the findings included the main themes of gender inequality in terms of the use of the Wi-Fi service as well as the awareness and engagement towards the service.

The research that was conducted and displayed in chapter 4 was necessary in order to address the third and fourth objective of the thesis. Objective three relates to policy documentation that supports technological inclusivity. From the findings, it was clear that more men than women were using the Wi-Fi service which indicate that firmer, more rigorous policy documentation should be formulated and implemented in order to allow more women to use the service.

Furthermore, the findings noted in this chapter forms the foundation to address the fourth objective which is to provide recommendations to the City of Tshwane and Project Isizwe based on the behaviour of the users. This will be illustrated in chapter 5.

5. CHAPTER 5 – Summary, Recommendations and Conclusion

5.1 Introduction

Chapters 1 and 2 laid the theoretical background and explained the purpose of this study. The world is becoming increasingly digitalised and the reality remains that people who are not able to access ICTs are in a disadvantaged position. The digital divide refers to the gap between people who have access to ICTs and those who do not have access. Chapter 3 illustrated an innovative initiative to bridge the digital divide. Chapter 4 showcased the statistics that were gathered through the users of the Wi-Fi service in the City of Tshwane.

Based on the findings provided in chapter 4, this chapter offers recommendations to the City of Tshwane and Project Isizwe in order to ensure that the maximum number of people are connected to the network. With reference to the users' preferences, recommendations are made to improve the Tobetsa Platform and create more appropriate content that would support the needs of the users.

5.2 Summary and Recommendations

In order to address the fourth and last objective of this thesis, which is to provide recommendations based on the behaviour of the users to improve the Wi-Fi service of the City of Tshwane and Project Isizwe, the following section will provide a summary as well as recommendations based on three main themes. These themes include gender inequality, content preference on the Tobetsa Platform, as well as engagement with the Wi-Fi service.

5.2.1 Gender Inequality

Within this study, the factors that contributes to the gender ratio with regard to the use of ICTs are not part of the research focus, hence only observations can be drawn from the data received and from the researcher's experience whilst conducting the surveys. There are many factors that could have contributed to the fact that the majority of the participants were men, including the public places where the FIZs are situated. Women might feel more vulnerable to be

alone in an open park, such as the Union Building or waiting at bus stations. Although the researcher, being female, were not familiar with the area, a male staff member from Project Isizwe was advised to accompany the researcher as a security measure when she visited the site. The high crime rate in South Africa might cause women to feel unsafe to be in a public space with expensive ICT devices such as laptops or mobile phones.

5.2.2   Content Preference on Tobetsa

As referred to in chapter 4, the most popular use of the Wi-Fi service, as indicated by the participants, is for educational purposes. The Tobetsa Platform, as described in chapter 3, is the platform that users immediately see once connected to the Wi-Fi Service-so called landing page. It is designed and maintained by Project Isizwe and a significant aspect is that the content on the platform can be accessed without any data usage limitations. Any other sites that are accessed through the Wi-Fi service are restricted to 500MB per day, per device. At this stage, the educational functions on the platform are restricted to the content on the Tobetsa platform, which might not serve the needs of all the users.

5.2.3   Engagement

Due to the current reality in South Africa and the challenges that were discussed in chapter 1 and chapter 2, literacy to interact with technology remains a major challenge in bridging the digital divide. The researcher observed that the five physical sites included in this study, were not supervised by any member from the City of Tshwane or Project Isizwe. The project assumes then that people will be able to connect to the Wi-Fi service and engage with the online content without any guidance or verbal instructions from a representative of the project. This observation relates to a potential barrier as to why the network has not yet reached its full capacity in terms of potential users. A person who is engaging with an ICT device for the first time might struggle with the basic functions, such as switching it on and finding the Wi-Fi Service network. After a connection to

the service has been made, engaging with online websites and content poses further challenges if a person has, for instance, never used a search engine.

5.2.4   Recommendations based on Gender Inequality

The recommendations are that the City of Tshwane, together with Project Isizwe review their Wi-Fi service sites to ensure that adequate security is present and visible. This could include, but are not limited to police presence, security cameras or notices of emergency contact numbers at the various sites. With regards to addressing the third objective of this thesis, is necessary to note that no reference is made to gender inequalities within the recently released National Integrated ICT policy. As a recommendation, the government could consider as part of their broadband strategy a policy to include the promotion of women in accessing ICTs. As part of the NDP, the researcher is of the opinion that a goal must be set for reaching inclusivity of women in ICTs. The latter will then apply pressure to the relevant stakeholders to create and maintain momentum towards transformation. The country is already on its way to reaching the goals as set out in the NDP and as educational and employment barriers are already addressed within the NDP, they should already form the foundation for a positive impact on promoting women to become active users of ICTs.

5.2.5   Recommendations based on Content Preference on the Tobetsa Platform

The recommendations in order to improve educational content on the Tobetsa platform are the following:

1. The advantage of a partnership between Project Isizwe and local universities and colleges would allow for students to access the websites of the entities in order to gain knowledge about the various programmes and qualifications that they could apply for. This would assist users to make informed decisions regarding their study directions and the financial implications. At this stage, UNISA and the University of Pretoria are the only universities available on the platform. In addition to this partnership, the

government could contribute by presenting the statistics of scares skills and qualifications which are needed in the country.

2. Providing unlimited access for educational purposes when accessing the university and colleges sites, would make it possible for the users to access the online libraries, the online assignment submission platforms, as well as send and receive student correspondence. This could eliminate the practical obstacles which many students who are not connected to the internet face.

3. Further partnership with various academic research websites in order to gain access to journal articles, publications or e-theses will contribute to the knowledge resource pool which users can access. It would be advantageous in the interest of the greater good if these sites were also not limited or part of the 500MB per day.

5.2.6   Recommendations based on Engagement

The recommendations to address the barrier of engagement and to assist people with the technology include the following:

1. Visible representatives at the FIZs: This could include volunteers or people from within the community who are willing to invest their time to help other members connect to and engage in the Wi-Fi service. An ideal initiative would be a funded programme where the youth within the community are the representatives and could earn a small income for their service. This initiative could form part of the LED program for the city.

2. Orientation sessions: These sessions can be designed in order to inform a large group of people at the same time on the use of the service. It could take place in the community hall or library where a FIZ is currently deployed, or at a venue close to where an outside FIZ is deployed. It will create an opportunity for prospective users to learn firstly, how to connect to the internet and secondly, what the advantages of the online content is, which might address their specific needs.

3. Training of librarians: By training librarians to connect and use the online content in a meaningful matter, will allow them to assist the users that would like to make use of the service within the library. The librarian should also have the relevant contact numbers at hand; firstly, in case there is any

disruption in the network where the technical team should assist and secondly, to refer a user to attend the orientation sessions if they are struggling to use the service.

4. Call centre: Representatives at every FIZ on a daily basis might not always be possible due to the large number of FIZs across the city. The strategy would be to place the representatives where the need for assistance is the most. For the other sites, contact numbers can be clearly posted at the FIZs in order to phone the call centre regarding network disruptions or any another problem at the sites, which can then be directed to the relevant authorities. Currently, there are only a handful of people working in the call centre which is operated only during office hours. This means that users will not be able to use the Wi-Fi service after hours if there is a problem which they cannot solve themselves. The strategy would be to include the youth to operate the call centre as an initiative to involve them in the community and gain technical exposure while earning a small income. Working shifts could be planned in such a way that assistance could also be provided after office hours.

5.3   Conclusion

Chapter 1 emphasised that technology has become an embedded part of the daily routine for a large part of the population around the world. Despite the positive impact of technology, the challenge of the digital divide remains, which separates the groups of people who have access to ICTs and those who does not. Chapter 2 further explored how this challenge manifests around the world, as well as in South Africa. Extensive attention was given to the benefits of being connected to the internet and how it supports the building blocks of development, as well as service delivery from a government's perspective.

Chapter 2 addressed objectives one to three by firstly conducting a theoretical exploration of the digital divide and the state of connectivity within South Africa and globally. Secondly, it determined the role of the government through e-governance and lastly identified policy documentation that supports technological inclusivity and advancement within local government in South Africa. When focusing on the role of the government, and specifically local

government, who is responsible for service delivery, there is legislation in place to hold municipalities accountable to deliver effective and inclusive services. If their services are made available online, they should ensure that all people have access to these technologies in order to reap the benefits thereof.

Chapter 3 described a case study where the City of Tshwane, in partnership with Project Isizwe, created a first ever for government initiative to bridge the digital divide. A cost comparison between various internet service providers was not done for this study, however the cost per gigabyte of data paid by the City to Project Isizwe was substantially lower as opposed to what is available in the market. The behaviour of the Wi-Fi users referred to in the case study is explored in chapter 4 and in this chapter the research created an overview of the users' preferences, the average age and gender of the target group.

Recommendations were made in chapter 5 based on the findings that were arrived at in chapter 4. The recommendations were based on gender inequalities and how government can promote the use of ICTs by women, how Project Isizwe can improve their educational content and lastly, how the City of Tshwane can improve awareness of, and engagement with the service.

There were limitations to this study, as described in chapter 1, such as research information that was too technical and had to be re-written for the purpose of this study, information that was not received in a timely manner from the relevant entities, and questionnaires that had to be disqualified. For the purpose of the study, the researcher was limited to a short questionnaire as there had not been any indication of the users' ability to interpret and respond to the questions in the language the questionnaires were written in. Also, in order to respect the respondents' time, the researcher did not want to burden the participants with too many questions while they were busy making use of the Wi-Fi service. The limited questions limited the researcher's ability to go into the questions and answers in depth and to understand the behaviour of each user.

This study is significant and unique as the initiative of providing free Wi-Fi to the end-user involves a stakeholder approach which combines the government,

non-profit organisations and the private sector in a collaborative manner to serve a communal purpose. Thus far, the many successes of this initiative are indicative of the positive progress made within South Africa to bridge the digital divide.

Future studies could explore the provision of internet connectivity as a basic human right since it has the potential to be used as a tool to aid unemployment, to promote equality and lastly, to provide access to educational opportunities, which contributes to the greater good and the upliftment of society as a whole.

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Appendixes

Appendix A: Obligations and Roles: City of Tshwane and Project Isizwe

City of Tshwane	Project Isizwe
1. Designate and permit access to the sites agreed to establish the hotspots.	1. Prepare a project plan aligned with the planned commission date.
2. Designate and permit access to certain sites for the purpose of installing server equipment for the duration of the service for no rental charge – minimum space of 20 U or half a cabinet to be reserved.	2. Plan the Wi-Fi Network in consultation with the Municipality in a reasonable manner to provide the service.
3. Facilitate access to and use of municipal equipment for the installations e.g. cherry pickers for lamp post installations.	3. Procure, configure, install and maintain the equipment needed to establish the Wi-Fi network.
4. Facilitate reasonable access to Project Isizwe, its employees and agents to the hotspots for the duration of the Agreement.	4. Implement IP network security measures for the service.
5. Provide accurate and up to date contact information of the specific personnel that may be needed to provide Project Isizwe with physical or remote access to any hotspot.	5. Monitor and report key performance indicators in the FIZ to provide an overall view of network health on at least a monthly basis, as required by Section 67 of the Municipal Finance Management Act 53 of 2003.
6. Provide details necessary for Project Isizwe to remotely access any equipment installed as a hotspot for the purpose of the service, configuration and content delivery over the Wi-Fi network.	6. Report at least monthly to the City Manager of the Municipality on actual expenditure against any transfers of funds made at that point in time as required by Section 67 of the Municipal Finance Management Act 53 of 2003.

City of Tshwane	Project Isizwe
7. Provide all reasonable access to back haul capacity and where possible, access to the City's fibre optic network for back haul of the FIZ areas free of charge.	7. Implement effective, efficient and transparent financial management and internal control systems to guard against fraud, theft and financial mismanagement as required by Section 67 of the Municipal Finance Management Act 53 of 2003.
8. Provide free, uninterrupted and reasonable access to Project Isizwe for the purpose of delivering the service and content over the Wi-Fi network, including access to the Wi-Fi network, back haul capacity and the cities fibre optic network.	
9. Provide sufficient and uninterrupted electricity supply to each hotspot free of charge.	

Source: (City of Tshwane: 2013(b):5-7)

Appendix B: Personal Impact of Wi-Fi service

Union Building	
Participant	**Response**
1	Able to access the internet at any time
2	It has made my life so easy
3	Research and information
4	Helped me in passing my assignments
5	Data Costs
6	You stay relevant by always surfing the net and finding out what's happening around the world
7	Reducing the cost of buying data
8	I am aware of the advertised posts at all times
9	Helps me to be more productive
10	I don't have to spend money for internet Café

Mahatma Ghandi Bus Station	
Participant	**Response**
11	I am able to apply for jobs and read mails
12	I am able to download school work
13	Always helped me when I ran out of data
14	It has been very useful
15	It's important with me because I do many things with Wi-Fi
16	Helped me a lot with my studies
17	I can check my e-mails from school and do my assignments
18	It helps me through my assignments
19	To save money. If I don't have money I use it
20	If I want to check my e-mails and I don't have data, I just come here. It is really helpful

Rev JM Buthane Community Library	
Participant	**Response**
21	That I can access the internet at no cost, which is really helpful, especially when doing my assignments
22	It has helped me a lot with my school work
23	It has helped me in many ways, especially with my studies
24	It's easy for me to Google my assignments
25	Easy access and good coverage
26	Getting information easy
27	Improved access to Internet without incurring too much data costs and it helps business to grow.
28	Makes things easy to do via network
29	The greatest of them all is that I can complete my University assignments very quickly and effectively using the Internet
30	Saves money and it helps me to get a MSc degree

Stanza Bopape Community Library	
Participant	**Response**
31	It has made my studies much easier and fun. I don't have to pay for steep Internet fees from Internet Café's
32	Helps me to do my online assignments
33	Easy access to my study material
34	Makes my school work to be much easier

35	Easy access on my online modules
36	Easy access to Internet has made a positive impact on my studies. I can do my research easily and other school related work very easily
37	I do not spend much money on data as much as I used to
38	In instances where I run out of data and need to use the Internet urgently it's the first option I run to
39	To get more information through researching
40	Getting information on-line; learning on-line
Ruth Mompati Bus Station	
Participant	**Response**
41	Made all on-line sites easily available
42	Helping a lot for school information
43	I have managed to stay connected to the social society on-line
44	Got a lot of information on the situation I was facing
45	It helped me save money on mobile data
46	I don't spend much on data anymore, meaning that money for data I can use it for stationery
47	I am able to know about current things which are happening in our country
48	Helps me to get enough information needed
49	It updates me and it makes me to be aware of everything going on in our country
50	Knowledge and be updated

Appendix C: Project Isizwe Wi-Fi Usage Survey

Project Isizwe: Wi-Fi usage

1. How old are you?

2. What is your gender?

Male	
Female	
Other	

3. How did you become aware of the Wi-Fi service you are currently using?

Friends and or Family	
At work	
Advertisement by City of Tshwane	
Other: Please specify	

4. What is your travel time to reach the closest Wi-Fi provision centre?

0-30 minutes		31-60 minutes		61+ minutes	

5. How many days per week do you use the Wi-Fi service?

6. For what purpose do you mostly use the Wi-Fi service?

Current Job tasks	
Seeking employment	
Educational: Studies	
Social Media	
Knowledge: News and other relevant world topics	
Other: Please specify	

7. What has been the greatest impact that the Wi-Fi service has had on your life?