# STRATEGY FOR SOUTH AFRICAN PUBLIC LIBRARIES TO BRIDGE THE DIGITAL DIVIDE

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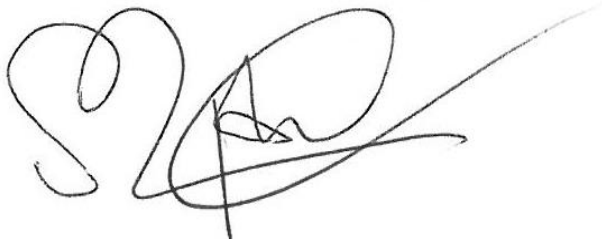
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# DECLARATION

I declare that the thesis, which I hereby submit for the degree Doctor Philosophiae in Information Science at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

Signed:

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Date: 30 May 2016

# ABSTRACT

This thesis reports on a study that investigated the role of public libraries in addressing the digital divide in South Africa. The study started in 2006. This study addressed the main research question:

"How should a theoretical model look for South African public libraries to contribute to bridging the digital divide?"

The central research problem was further addressed by asking the following questions:

- What are the scope and implications of the digital divide? (These include the meaning of the concept, the dimensions and the factors leading to the digital divide.)
- What has been reported on the role of libraries (including information services) in bridging the digital divide?
- What have libraries in South Africa done to address the digital divide, and which possibilities are foreseen?
- How can South African libraries be positioned to contribute to bridging the digital divide?

The study followed a survey method using interviews with directors of Provincial Library Services (or their representatives), which are the controlling bodies of public libraries in South Africa, questionnaires distributed to representative staff members of participating public libraries in Gauteng, Limpopo and KwaZulu-Natal and individual interviews with selected heads/representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal. Data collected through the questionnaires were both quantitative and qualitative. Data was collected between 2011 and 2012. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS), while qualitative data from interviews were analysed by content analysis and thematic categorising of information. In October 2015 a

follow-up study of limited scope was conducted with three representatives from the three provincial library services to establish developments since the first round of data collections.

Seven out of nine directors of Provincial Library Services in South Africa participated in the study. Furthermore, 247 public libraries from Gauteng, Limpopo and KwaZulu-Natal out of 463 public libraries and 18 heads/representatives of public libraries participated in this study. Findings on the opinions expressed on the role of public libraries in bridging the digital divide include the following: providing access to information and communication technologies (ICTs), offering information literacy and ICT literacy training, providing information to reduce the gap between "haves" and "have-nots", providing communities with equal, free access, reaching out and spreading ICTs to those who may not have online access and support and facilitating and promoting information exchange and communication between citizens and the government.

The overall findings from the study were that although provincial library services have documents containing information on their mission and vision, their mission and vision statements do not address the digital divide or shed any light in this regard. The study found that provincial library services aimed to support public libraries to provide information resources, services to communities and access to information through ICT via targeted fund transfers to municipalities.

None of the provincial library services included in the study had an explicit policy and strategies aligned to its vision and mission to guide and enable it in addressing the digital divide. Although all provincial library services included in the study had access to computer facilities in their headquarters, there were still disparities in the number of computer facilities available. It was also found that none of the provincial library services had its own website at the time of the study. They depended on the websites of their parent organisations. The study

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found that very few provincial library services had information technology (IT) units/departments charged with the responsibility of taking care of ICT facilities. They depended on external ICT service providers or the IT departments of their parent organisations to maintain the library's ICT infrastructure.

Although most public libraries had computers available for use by library staff and the public, this did not apply to all. A few public libraries had only one or two computers available. A significant number of public library representatives claimed not to understand what the digital divide was about; their explanations on initiatives, however, reflected an intuitive understanding. None of the public libraries had a website.

Challenges faced by public libraries include budget cuts, inadequate funding, staff shortages, lack of training in the use of ICT and failure to offer information literacy programmes, lack of ICT strategies, inadequate physical space to accommodate users, lack of ICT maintenance support, lack of government support, high costs of connectivity, security (theft of equipment) and lack of skills in using ICTs such as computers and the internet. The findings highlighted support for people who have access to ICT but do not have the necessary skills to use such technology despite their willingness to learn, people who have access to ICT but do not have the necessary skills to use such technology and have no desire to learn, people who do not have access to ICT but wish to have such access and to learn the necessary skills to use technology, and people who do not have access to ICT and do not want to learn the necessary skills nor use technology. With the follow-up study of limited scope it was found that there are still inadequate resources, shortage of staff with ICT skills and inadequate funding.

Based on the findings, the study proposes a stakeholder as well as process model for public libraries to address the digital divide. The stakeholder model brings on board key stakeholders who can contribute to addressing the challenge. The model reflects the following stakeholders: government, provincial library services, public libraries, advisory committee, community partners and the

community of users and non-users. Public libraries are viewed as key stakeholders in addressing the digital divide. The model considers in its design that public libraries cannot function on their own; when addressing the digital divide, they should align their role with support from other stakeholders, as reflected in the proposed model. The process model focuses on critical processes such as establishing a policy/legal framework, establishing an infrastructure to bridge the digital divide, human resource capacity building, including training, connecting to funding agencies, generating content, involving the community of library users and non-users, continuing studies of user needs and assessment of the impact of efforts to bridge the digital divide.

The study concludes by making recommendations on action needed to address the digital divide by public libraries in South Africa, the most important being the development of strategies and policies for bridging the digital divide, the establishment of an advisory committee advising each provincial library service, soliciting funding for ICTs, development and implementation of training programmes for ICT, providing more ICT support, promoting libraries and providing easy access to library and information services to the disabled and elderly.

# ACKNOWLEDGEMENTS

# LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ABSA | Amalgamated Banks of South Africa |
| CSIR | Council for Scientific and Industrial Research |
| DAC | Department of Arts and Culture |
| GCIS | Government Communications and Information Systems |
| GDP | Gross Domestic Product |
| HDI | Human Development Index |
| ICASA | Independent Communication Authority of South Africa |
| ICTs | Information and Communication Technologies |
| IFLA | International Federation of Library Associations |
| ISAD | Information Society and Development |
| ITTC | Information Technology Training Centre |
| LTE | Long-Term Evolution |
| MDGs | Millennium Development Goals |
| MPCCS | Multipurpose Community Centres |
| NDR | National Digital Repository |
| PNC | Presidential National Commission |
| PPPs | Public-Private Partnerships |
| SABC | South African Broadcasting Corporation |
| SLIMS | SITA Library Information Management System |
| SPSS | Statistical Package for Social Science |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| USA | Universal Service Agency |
| USD | United States Dollar |
| WSIS | World Summit on Information Society |

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# CHAPTER ONE: INTRODUCTION AND BACKGROUND

## 1.1. INTRODUCTION

Since the invention of the World Wide Web (Web) in the 1990s, providing access to information in digital format via websites accessed on the internet has become a major activity in the world. The Web is used for several activities such as electronic commerce, telematic education, Web-based provision of library and information services and many more. Organisations, governments and individuals across the world are also using the Web infrastructure to provide access to various information resources and services. In this global digital information age those who are unable to access the internet and Web through the application of information and communication technologies (ICTs) (e.g. computer, telephone, internet, etc.) are increasingly disadvantaged in their access to information, which leaves one with information-rich and information-poor communities. This is referred to as the digital divide.

Many governments are concerned about the digital divide and its possible impact on the community (Chisenga, 2005; Cullen, 2003:247; Doong & Ho, 2012; Hubregtse, 2005:165; Jianzhong, 2002:3; Mutula, 2005:591; Mutula, 2008; Mutula & Mostert, 2010; Rahman, 2007), which brings about urgency to address the issue.

There is an urgent need to narrow the gap between the information-rich and the information-poor. The availability and use of ICT increases the urgency for the narrowing of the digital divide between developed nations and developing nations. Lack of access implies that people are unable to participate in the world economy and enjoy the benefits of the internet. As internet technology becomes accessible and affordable, it can offer an enormous opportunity to reduce the divide. The internet, for example, offers opportunities to develop various programmes such as reading tutorials for all levels. People are also able to listen to radio channels and read online versions of newspapers via the internet (Kasusse, 2005).

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According to Rahman (2007), computers, modern ICT such as cellular phones, wireless networks and the internet reduce communication costs and break down geographical borders. The internet is furthermore transforming business practice in its relation to suppliers and customers, in its management, in its production processes, in its cooperation with other firms and in its financing and the valuation of stocks in financial markets. According to Castells (2001:65), the use of the internet is becoming a key source of productivity and competitiveness for all kinds of business. The internet serves as a powerful tool for empowering people, benefitting business and virtually linking people around the world to share their views, ideas and innovation (Rahman, 2007).

The internet is not only improving the way businesses operate (Srinuan & Bohlin, 2012). It can also improve the lives of people. It is, for example, easy to communicate with a person who is abroad by using email. It is a less expensive means of communicating. One can send and receive messages through this facility. People are able to do their shopping online without having to travel to the shops. They can purchase items locally or abroad through the internet. Personal banking on the internet is also changing the way people deal with their finances. People can pay bills and transfer money from the comfort of their homes or offices. They do not have to go to the bank and carry a huge amount of money around. All these benefits are possible if one has access to the necessary ICTs.

The value of the internet, however, is not directly proportional to the volume of connectivity that it creates. Its development value is directly proportional to the degree to which those who use it can apply the information that they obtain from it in the management of their day-to-day activities in their businesses or industries (Castells, 2001). People thus need more than access to the internet. They need to be trained to be able to use the resources of the internet for the effective management of the knowledge, resources and ideas it contains (Mbambo, 2002). They need to be trained to find information on the internet (Jaeger *et al.*, 2006). Lack of access to the internet, as well as the ability to use it,

means that people are excluded from information, which is increasingly viewed as a human right.

The gap between the information-rich and information-poor is a worrying factor, especially in Africa. In most of the Western nations government policies are being established that attempt to ensure that all citizens have the opportunity to access and use ICTs effectively to enable them to participate fully in the educational, social and economic activities and democratic processes that make use of these technologies. Many governments (e.g. United States of America, Islands of Oceania, Argentina, Shanghai, Kenya, Namibia, Canada, South Africa, Mexico) and organisations (e.g. Bill Gates Foundation, European Union, Regional Satellite Communication Organisation, and the Common Market for Eastern and Southern Africa) are taking action to help bridge the digital divide. This includes action by libraries (Cruz-Jesus,; De Munster, 2004; Dorr & Akeroyd, 2001; Fong, 2009; Jianzhong, 2002; Kinney, 2010; Mantora, 2001; Mutula, 2002; Notley & Marcus, 2008; Oliveira & Bacao, 2012; Osunkule, 2010; Ruecker, 2012; Serima, 2007).

South Africa is also faced with and affected by the digital divide (Martindale, 2002; Moulaison, 2008; Mutula & Mostert, 2010; Reece, 2008; Sigh, 2004:5). ICTs are changing the way people communicate in developing countries (Moulaison, 2008). One of the main reasons for the digital divide in South Africa is considered to be the apartheid legacy that promoted separate development, which provided inferior education and poor or no access to learning opportunities for non-whites (Sigh, 2004:5). Socio-economic circumstances, imbalanced educational policies under the apartheid regime, as well as language barriers, are some of the recognised factors for the digital divide in South Africa (Mutula & Mostert, 2010; Osunkunle, 2010; Sikhakhane, Lubbe & Klopper, 2005).

However, the South African community is rapidly adopting the internet, with most press, radio and television advertisements featuring a universal resource locator.

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Roadside billboards advertise the internet, most television and radio shows have their own websites and about 49 daily and weekly newspapers are published in online versions (GCIS, 2012). Electronic banking, events booking/ticketing and online purchases of some products are possible through the internet. Many entities offering these services have secure servers and electronic commerce facilities (Kasusse, 2005:149).

The South African government has been taking various initiatives in order to bridge the digital divide (Petje *at al.*, 2002:317; Mutula & Mostert, 2010; Osunkunle, 2010; Sikhakhane, Lubbe & Klopper, 2005; Singh, 2004). According to Petje *et al.* (2002:317), Czerniewicz (2004) and Singh (2004), building a smart economy and bridging the digital divide is among the government's core priorities. The following are some of the government initiatives in bridging the digital divide:

- In 2001 South African President Thabo Mbeki convened a consultative meeting of leading international information technology companies (IMB, CISCO, Hewlett Packard, Alcatel etc.) to deliberate on possible ways of reducing the digital divide (Meyer, 2001).
- Former Gauteng Premier Mbhazima Shilowa allocated R500 million from the provincial budget over a three-year period to the Gauteng Online Programme, which began in 2001, with the purpose of bridging the digital divide (Petje *et al.*, 2002:317).
- The South African government, in partnership with the postal service, initiated the installation of computers in post offices across the country to help the poor and the illiterate to access government services (Ngobeni, 2001).
- Other efforts include the building of multi-purpose community centres (MPCCs) (Jacobs & Herselman, 2006). The South African government established an Information Society and Development Programme aimed at increasing South Africa's uptake and usage of ICT by the government and individuals. The government has set up a presidential priority project

in the form of the Presidential National Commission (PNC) on Information Society and Development (ISAD), bringing together stakeholders to address the challenges of bridging the digital divide (DOC, 2011). This includes the establishment of Meraka Institute, which is an operating unit of the Council for Scientific and Industrial Research (CSIR) focused on ICT. Meraka Institute is aimed at researching and developing new technology that enables ICT access, inclusion and use (www.csir.co.za/mearaka/).

A detailed discussion on the digital divide in South Africa will be provided in Chapter 2.

This chapter (chapter one) will discuss the following:

- Aims and objectives of the study
- Theoretical basis and framework for the study
- Importance of what libraries can do
- Concept of the digital divide
- Challenges of bridging the digital divide
- Problem statement
- Research methodology
- Demarcation of research
- Significance of the study
- Division of chapters

## 1.2. AIMS AND OBJECTIVES OF THE STUDY

The aim of the research was to investigate the role of public libraries in addressing the digital divide in South Africa. The specific objectives were to determine the scope and implications of the digital divide (These include the meaning of the concept, the dimensions and the factors leading to the digital divide.), investigate what has been reported on the role of libraries (including information services) in bridging the digital divide, report on what have libraries in

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South Africa done to address the digital divide, and which possibilities are foreseen and propose the theoretical model for public libraries to address the digital divide.

In order to achieve this aim, the study provided a literature review on the concept of the digital divide, investigated what has been reported on the role of libraries in addressing the digital divide, and what has been done by South African public libraries to address the digital divide. The study also set out to raise awareness among the managing structures of public libraries of the need to address the digital divide and to formally note the barriers that need to be addressed. The intention was to propose a theoretical model or models that highlight the stakeholders as well as the processes for public libraries to address the digital divide. Such models had to build on a literature review as well as a survey among South African public libraries. The ultimate aim of this study was to propose a model(s) from a management perspective for public libraries to bridge the digital divide – starting with South Africa, and admitting that this will need to be followed up by large-scale surveys among users and non-users of public libraries.

## 1.3. THEORETICAL BASIS AND FRAMEWORK FOR THE STUDY

Studying the concept of the digital divide and the role of public libraries is not new. Many studies have been undertaken, resulting in different theories on approaching the digital divide. Although the focus of this chapter and indeed this study is more practical, theoretical approaches to studying and bridging the digital divide were noted and where considered appropriate, influenced planning of the study. A psychological model of e-adoption in the context of the digital divide proposed by Thatcher and Ndabeni (2011) seemed most appropriate. It incorporates several key theories that have been reported with regard to studying and addressing the digital divide. These are discussed in more detail in chapter 2. Not all facets of this model or the theories and models on which it build were considered in the study reported here. The current study was mostly limited to awareness and accessibility of technology from the library management

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perspective. In the recommendations for theory, practice and future research theories and models feature again as a next step in pursuing the research problem.

## 1.4. IMPORTANCE OF WHAT LIBRARIES CAN DO

According to Oliver (2007), libraries offer three essential ingredients needed to ensure the benefits of global access for all in the digital era: infrastructure, content and access. Jaeger *et al.* (2012) added that public libraries provide important public-access computing and Internet access in their communities. He focuses specifically on public libraries. According to Rahman (2008), libraries are seen as the solution to challenges of the information society, as well as the champions of promoting the information society. Jaeger *et al.* (2012) and Lough (2008) argue that especially public libraries are considered the "ideal vehicle" to provide access and support for computer literacy. Libraries, with their commitment to freedom of access to information and promotion of lifelong learning, have an important role to play in closing the digital divide (Rahman, 2008; Singh, 2007). In this regard public libraries were identified early on as important players in the task of equalising computer and internet access. In 1993, the vice-president of the United States of America, Al Gore, suggested that public libraries could serve as a "safety net" in providing internet access (Kinney, 2010). According to Moe (2004) the importance of analysing the role of libraries (in general) in bridging the digital divide is that it will provide policy-makers with information needed for making effective decisions related to technology in public libraries.

The perceived value of libraries in bridging the digital divide is due to the presumed accuracy of information, ease of use and helpful assistance received from librarians. Libraries can also provide training in the use of facilities such as the internet (Akter & Shuva, 2011; Chisenga, 2005:9; Dorr & Akeroyd, 2001; Kreps, 2005; *Learning and libraries*, 2004:10; Samaras, 2005). They can also initiate community-based programmes for the elderly and offer adult education

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courses to bridge the digital divide between young and older people (Dorr & Akeroyd, 2001:38). This is also referred to as bridging the grey digital divide (Asla, Williamson & Mills, 2006; Millward, 2003; Morris, 2006). Juznic *et al.* (2006:332) argue that the use of ICTs has become more and more wide-spread and problems with social groups left out will be visible and will have negative implications for the equality of all citizens. Seniors as a social group are especially vulnerable and need help.

Public libraries can thus be instrumental in bridging the digital divide and expanding the public's access to a wide variety of information-seeking tools (Oliver, 2007), and therefore libraries can and must find new services with initiatives that promote the reduction of the digital divide among all. The question therefore arises: what can public libraries do to bridge the digital divide in South Africa? A detailed discussion on the role of public libraries in addressing the digital divide will be provided in Chapter 3.

## 1.5. CONCEPT OF DIGITAL DIVIDE

As explained, the uneven distribution of access to ICT and information within countries and between countries resulted in a digital divide. Many people are excluded from access to ICT and global knowledge. Among others geographical factors, educational factors, attitudinal factors, physical access, physical disabilities, gender, lack of ICT skills and support, lack of relevant content, age and racial segregation contribute to the digital divide (Cullen, 2001:1; Jaeger *et al.,* 2012). These factors have also been discussed extensively by other authors such as Chisenga (2005), De Munster (2004), Ferro, Helbing and Gil-Garcia (2011), Kiplang'at (2001), Mutula (2002), Pigato (2001), Salinas (2003), Shirazi *et al. (*2010) and Singh (2004). To address a problem, one needs clarity about the concept. This section will present various definitions of the concept of the digital divide as found in the literature. It will also outline the working definition of the concept 'digital divide' used in this thesis. Although these definitions are

presented in this introductory chapter, they are discussed in more detail in Chapter 2 of this study.

There are numerous definitions for the digital divide. The following are examples:

Digital divide is broadly conceptualised as the division or gap between those who have access to ICT and are using it effectively, and those who do not (Bridges.org, 2001; Ferro, Helbing & Gil-Garcia, 2011). Salinas (2003:131) defines the digital divide as the disparity between individuals or communities who can access electronic information and communication tools, such as the internet, to better the quality of their lives and those who cannot. According to Rahman (2008) the term digital divide has been applied to the gap that exists in most countries between those with ready access to ICT and its tools, and those without such access or skills.

Mamtora (2001) mentioned that the concept digital divide has been used to describe the gap between those nations that use ICT to allow them to access informational and decision-making resources. Chisenga (2005) refers to two groups of people. One group has the best information technology that society has to offer, e.g. computers, telephones, faster internet services as well as a wealth of content and training relevant to their lives. The other group of people, for one reason or another, does not have access to the newest or best computers, reliable telecommunication and fast internet. The difference between these two groups is what he regards as the digital divide.

The OECD (2011) defines the digital divide as "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies and to their use of the Internet for a wide variety of activities". There is not a single divide, but multiple divides; for instance, within countries, between

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men and women, between the young and the elderly, between different regions etc. (World Information Society Report, 2007).

Adebesin and Kotze (2012), Adeogun (2003), Alsa, Williamson and Mills (2006), Ani, Uchendu and Atseye (2007), Chen (2013), Doong and Ho (2012), Fink and Kenny (2003), Gautum (2014), Guomundsdottir (2005), Kibaya (2005), Loo and Ngan (2012), Millard (2003), Norris (2006), Pigato (2001), Pluss, (2009), Reddick *et al.* (2012), Riley (2004) and Sandor (2005) describe the digital divide as "a multidimensional phenomenon" comprising disparities in the following contexts:

- **Global divide:** The gap in internet access that exists between industrialised and developing countries;
- **Social divide:** The gap between "information rich and poor" within countries;
- **Grey digital divide**: The digital divide between the young and elderly people;
- **Democratic divide:** The differences within the online community of users who either choose to use technology, or not, "to engage, mobilize, and participate in public life" (Gautam, 2014; Min, 2010; Nam & Stromer-Galley, 2012; Norris, 2001; Oliver, 2007; Swindell, Grimbeek, & Heffernan, 2011; Weiss, 2012).

In this study, the concept of the digital divide is defined as the gap between
  (1) people who have access to ICT
- and do not have the necessary skills to use such technology
    - despite their willingness to learn
    - or have no desire to learn
  (2) people who do not have access to ICT
    - but wish to have such access and to learn the necessary skills to use technology
    - or do not want to learn the necessary skills nor use the technology.

It includes a **global divide** (gap between industrialised and developing countries), **social divide** (gap between "information rich and poor"), **grey digital divide** (gap between young and elderly people), **democratic divide (**differences within the online community of users who either choose to use technology, or not).

This study will discuss the concept of the digital divide in greater depth in the next chapter. To further extent understanding of the concept of the digital divide the argument for viewing the digital divide a continuum will be introduced in chapter two.

## 1.6. CHALLENGES OF BRIDGING THE DIGITAL DIVIDE

Bridging the digital divide nationally and internationally entails more than supplying communities with computers. It also requires taking into consideration the dimensions of the digital divide, as set out in the preceding section.

Several obstacles have been noted to hamper information technology uptake in a variety of communities (Mariscal, 2005; Merritt, 2011; Moe, 2004; Morris, 2007; Notley & Foth, 2008; Oliver, 2007; Reddick, Abdelsalam & Elkadi, 2012). Lack of access to technological infrastructures, illiteracy, poverty, geographical location, unemployment and lack of volunteers among residents to assist in technology education are some of the prevailing problems (Mutula, 2002:128). Authors such as Alemna (1998), Antonio and Tuffley (2014), Cullen (2001), Hassler and Jackson (2010), Middleton and Chambers (2010), Munyua (2000), Mutula and Mostert (2010), Moyo (1996), Opoku-Mensah (1998), Park and Kim (2014), Pigato (2001), Sheba (1998) and Shirazi *et al.* (2010) have researched the factors that hamper the uptake of ICT.

The main challenges in bridging the digital divide have been argued to include the following:
- Lack of physical access to ICTs specifically computers, and the internet

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- Lack of skills and support specifically
- Attitudinal barriers: This refers to cultural and behavioural attitudes to the technology, e.g. that computers are for "brainy" people, for males, for the young, are difficult to use or belong to a middle class "white" culture
- Age
- Content
- Lack of capacity
- Racial segregation
- Income
- Education
- Legal and regulatory framework issues
- Language
- Gender
- Physical disability.

Chapter two will elaborate on the challenges that are faced in bridging the digital divide. Efforts by libraries and information services to address the digital divide, as well as new roles for library and information professionals in this regard have been reported (e.g. Aabo, 2010; Baro *et al.*, 2013; Chisenga, 2005; Dorr & Akeroyd, 2001; Galluzzi, 2009; Gautam, 2014, Kreps, 2005; *Learning and libraries*, 2004:10; Mutula & Mostert, 2010; Obeidat, 2015; Samaras, 2005). However, when libraries and information services get involved, there are a number of issues and problems that need to be addressed, such as lack of funding to libraries, shortage of library staff, shortage of well-trained staff, lack of resources, lack of appreciation and recognition of the importance of libraries and high cost of computers and internet access (Bertot, McClure & Jaeger, 2008; Chisenga, 2004; Foley, 2006; Gosh, 2005; Jaeger *et al.*, 2006; Kinney, 2010; Moe, 2004; Nkanu & Okon, 2010; Plumb, 2008; Singh, 2008; Shuva, 2005; *Towards Equality of Access*, 2004).

Although government policies in some countries, such as Zimbabwe, Kenya, Zambia, Uganda, Malawi, Nigeria and South Africa, have emphasised the need

to have libraries, they do not always offer the supporting resources, funding, etc. for libraries, which means that some librarians are working in badly constructed, poorly resourced libraries (Chisenga, 2005). National archives with a mandate to hold the nation's heritage in custody often also restrict access to certain pieces of information (Mutula, 2002:129).

Although libraries can play a role in addressing the digital divide, the complexity of the task and the challenge they face should thus not be underestimated. To be successful, clarity is required about the role public libraries can play in bridging the digital divide, and how they need to proceed. This can be captured by a theoretical model of the role public libraries can play in bridging the digital divide, which addresses its challenges, barriers, scope, etc.

## 1.7. PROBLEM STATEMENT

Understanding the concept of the digital divide, its scope and implication is essential if it is to be addressed. South African public libraries need to obtain insight and guidelines on the role they can play in bridging the digital divide. The government of South Africa needs to obtain insight into the importance of libraries in bridging the digital divide and might be encouraged to support library initiatives. The general public need to be informed of what the digital divide is and how it can be addressed, and how they can contribute. The problem can be addressed from a user perspective or from a managerial perspective. This study opted for the latter.

The proposition was that public libraries may play a vital role in helping to bridge the digital divide by providing free access to the internet and other technologies, as well as skills training. To some people the library is the only point at which they can access information through ICTs without any costs (Khati, 2013). Public libraries are suitable for this study, as they are viewed as places and institutions of significant value to their communities and champions for promotion of an information society (Singh, 2007; Rahman, 2007; Vrana, 2010). The International

Federation of Library Associations (IFLA) indicates that in order to bridge the digital divide, it is necessary to create libraries and information centres offering an environment that allows free and fair access to information and digital resources. According to Rahman (2007) and Gomez (2012), public libraries are seen as a possible solution to challenges concerning access to information. According to Khati (2013), the digital divide is part of bigger social divides. If people are not part of the digital world then they will be shut out of the mainstream of society. More discussion on the suitability of public libraries is provided in Chapter 3 (section 3.1).

The central research problem for this study thus focuses on the question of what role public libraries can play in bridging the digital divide and how they can do this.

The central research problem can further be addressed by asking the following questions:
- What is the scope and implications of the digital divide? (These include the meaning of the concept, the dimensions, the factors leading to the digital divide, as well as its implications.)
- What has been reported on the role of libraries (including information services) in bridging the digital divide?
- What have public libraries in South Africa done to address the digital divide, and which possibilities are foreseen?
- How can South African public libraries be positioned to contribute to bridging the digital divide?

## 1.8. RESEARCH METHODOLOGY

This section briefly introduces the research design and methods that were followed in this study. A more detailed discussion of the entire research process, including the methods, is presented in Chapter 4 of this study. This study is based on a literature survey and an empirical survey, which will include

qualitative as well as quantitative approaches to investigate the research problem. The objective was to use both approaches so that they complement each other, to help in increasing the validity and the reliability of the data collected, and to collect richer data.

### 1.8.1. Literature survey

A literature survey (non-empirical method) was conducted on the concept of the digital divide, challenges faced and causes of the digital divide, as well as the role of libraries in bridging the digital divide. Reports of efforts by libraries are also covered. This has helped to define the concept of the digital divide and to identify the issues that need to be addressed in the model, as well as in the empirical component in the investigation of the digital divide and the role of public libraries in it. This was fundamental, as it helped define key concepts. Findings from the literature were used as a basis for the development of the empirical survey as well as the proposed model.

In the literature review the work of Adebesin and Kotze (2012), Ani, Uchendu and Atsye (2007), Bach, Zoroja and Vukši (2013), Castells (1998), Chisenga (2002), Crede and Mause (2004), Cullen (2003), Epstein, Nisbet, Gillespie (2011), Ferro, Fink and Kenny (2003), Foley (2006), Furstenburg (2005), Gebremichael and Jackson (2006), Gorski (2001), Guomundsdottir (2005), Hassler and Jackson (2010), Helbig and Gil-Garcia (2011), Hubregtse (2005), Jaeger *at al.* (2012), Kibaya (2005), Kizza (2013), Middleton and Chambers (2010), Muir and Oppenheim (2003), Reddick, Abdelsalam and Elkadi (2012), Shirazi *et al.* (2010), Samara (2005), Sikhakhane and Lubbe (2005), Van Dijk and Hacker (2003), and Warschauer (2004) especially guided interpretation of the concept of digital divide and the problems faced. With regard to the role of the public library in bridging the digital divide, the work of Anaraki and Heidari (2010), Aqili and Moghaddam (2008), Balina (2014), Berryman (2004), Bertot, McClure and Jaeger (2008), Bishop *et al.* (1999), Chisenga (2004), Foley (2006), Gautam (2014), Ghosh (2005), Gyamfi (2005), Hull (2001), Jaeger *et al.* (2012), Jaeger

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and Fleischmann (2007), Kinney (2010), Kreps (2005), Liu and Wnuk (2009), Moahi (2003), Moe (2004), Mutula (2007), Oliver (2007), Plumb (2007), Rahman (2007), Russel and Huang (2009), Singh (2007), Shuva (2005), Stevenson (2009), Singh (2007), and Vrana (2010) is of special importance.

### 1.8.2. Empirical study

### (a) Population of the study

The rationale and the detailed description of the study population are provided in Chapter 4. The following were the groups that formed the population of the study:

- Directors of provincial library services
- Heads/representatives of selected public libraries

These groups represented the managerial level in South African public libraries, as those who are in the position to address the challenges and who can, based on the findings of this study, move research to a next level of involving library users and non-users. The choice of research population also supported the aim of the study to raise awareness for the role of public libraries in addressing the digital divide.

### (b) Data collection methods

Data from the South African context were collected by means of the following methods:

- Semi-structured interviews with directors of provincial  library services in South Africa (Appendix A)
- Questionnaire to heads/representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal (Appendix B)
- Semi-structured interviews with heads/representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal (Appendix C)
- Follow up semi-structured interviews with directors from provincial library services in Gauteng, Limpopo and KwaZulu-Natal (Appendix D).

The study focused on public libraries from three provinces, namely Gauteng, Limpopo and KwaZulu-Natal. Gauteng is more advanced in terms of resources

and the larger part of it is urban, while Limpopo and KwaZulu-Natal are less advanced and predominantly rural. This gave different perspectives of public libraries in developed and developing areas. These provinces were also easily accessible to the researcher.

The data collection process started in the form of semi-structured interviews (see Appendix A) with representatives from the controlling bodies of public libraries in South Africa, namely the provincial library services of all nine provinces. The purpose of these interviews were to obtain data on the number of public libraries in each province, compile a list of public libraries in the selected provinces, establish which public libraries were involved in projects for bridging the digital divide and find out how these projects were funded. Gorman and Clayton (2005:125) argue that the advantage of interviews is that they allow the researcher to receive an immediate response to a question, unlike other forms of data collection, which may result in significant delays in the data collection process.

Further data were collected from public libraries through questionnaires (see Appendix B). Gauteng is divided into 11 municipalities; Limpopo consists of 30 municipalities while KwaZulu-Natal consists of 58 municipalities. Provincial library services distributed questionnaires to all public libraries in their respective provinces, since they suggested that it would be advisable if the questionnaires were distributed through their offices. It seems to be standard procedure in all provinces that if one needs to conduct a study in a particular library, permission must first be granted by the provincial library services and data collection tools must also be distributed through them. However, they do not check and approve the tools. They seem to be more interested in the motivation letter accompanying the tools. The advantage of this was that public libraries were more likely to respond to a questionnaire coming from their provincial library services rather than coming from an individual researcher.

Semi-structured interviews (see Appendix C) were conducted with heads/representatives from eighteen libraries. One representative from each public library was involved to obtain more information on the role they can play to help bridge the digital divide.

Given the limited resources for this study, such as time and money, and the fact that interviews had already been conducted with directors of provincial library services, it was decided that it would be best to use only 18 representatives. Therefore, a systematic random sampling strategy, which is a selection of say, every eight or tenth name on the list in a sequence that must originate by chance (Leedy & Ormrod, 2010), was used for selecting these public libraries. Lastly, to conclude the study, follow up semi-structured interviews were conducted with three directors of provincial library services in Gauteng, KwaZulu-Natal and Limpopo (see Appendix D).

### (c) Data analysis

Qualitative and quantitative data were collected from semi-structured interviews and a structured questionnaire. Content analysis was used to analyse qualitative data, while quantitative data from the questionnaire were analysed using Statistical Package for Social Science (SPSS). More detail on this is provided in Chapter 4.

### 1.9. DEMARCATION OF RESEARCH

The study only focuses on three provinces in South Africa, namely Gauteng, KwaZulu-Natal and Limpopo. (The nature of public library services in these provinces is briefly stated in the preceding section.) Nine directors of provincial library services were invited for semi-structured interviews, but only seven directors participated. Although other libraries can also play a role in bridging the digital divide, e.g. the National Library, as explained by Lor (2003), the study only concentrates on the role of public libraries in three provinces in South Africa. It will, however, take note of current progress being made in other countries for

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comparative purposes, as well as publications reporting on research and initiatives in other South African provinces.

## 1.10. SIGNIFICANCE OF THE STUDY

The study could contribute to the field of knowledge in several ways:

- South African libraries can obtain insight and guidelines on the role they can play in bridging the digital divide.
- The government of South Africa can obtain insight into the importance of libraries in bridging the digital divide and might be encouraged to support library initiatives, as they are also currently trying to find ways to bridge the digital divide. They may realise that close co-operation with libraries may be fruitful.
- The general public could be informed of what the digital divide is and how it can be addressed, especially through help with improving their information-seeking skills.
- The proposed model can direct library planning and initiatives in South Africa to bridge the digital divide.

## 1.11. DIVISION OF CHAPTERS

The thesis has been structured according to the chapters illustrated in figure 1.1.

**Figure 1 .1: Diagrammatic illustration of division of chapters**

| |
|---|
| **Chapter 1**<br>Introduction and background |

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| **Chapter 2**<br>Literature review on the concept 'digital divide' |

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| **Chapter 3**<br>Literature review on the role of public libraries in bridging the digital divide |

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|---|
| **Chapter 4**<br>Research design and methodology |

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| **Chapter 5**<br>Analysis and interpretation of data |

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| **Chapter 6**<br>Literature review update and limited follow-up surveys in three key provinces |

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|---|
| **Chapter 7**<br>Proposed models for public libraries in bridging the digital divide in South |

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| |
|---|
| **Chapter 8**<br>Findings, recommendations and future research |

## Chapter 1: Introduction and background

This chapter offers an introduction and an overview on the study. It covers the background to the study, clarification of the concept 'digital divide', challenges of bridging the digital divide, problem statement (which includes the principal question), the methodology, demarcation of the research, significance of the study and the division of chapters.

**Chapter 2: Literature review on the concept 'digital divide'**

Chapter 2 presents a review of relevant literature on the concept 'digital divide' and different interpretations, dimensions of the concept digital divide, factors contributing to the digital divide, attempts to bridge the digital divide and the digital divide in South Africa.

**Chapter 3: Literature review on the role of public libraries in bridging the digital divide**

This chapter offers a review of relevant literature on the following: why public libraries should play a role as well as roles that public libraries can play. It also covers literature on the challenges faced by public libraries in bridging the digital divide.

**Chapter 4: Research design and methodology**

This chapter describes the research design of the study. This includes research problems and research questions, research approach, survey research, a review of research methods used in related studies, identification of the population for the study, data collection techniques, limitation of the study and means of data analysis.

**Chapter 5: Analysis and interpretation of data**

This chapter offers an analysis of both qualitative and quantitative data collected. It presents the information obtained from semi-structured interviews and questionnaires. This chapter also offers an interpretation of data and discussion of data that were analysed.

**Chapter 6: Literature review update and limited follow-up surveys in three provinces**

This chapter reviews the literature on the digital divide appearing after the time of planning data collection – thus from mid-2011 to 2015. It also presents the findings from limited follow-up surveys in the three key provinces. The purpose of

this chapter is to assess developments after the initial literature review and data collection.

**Chapter 7: Proposed model for public libraries in bridging the digital divide in South Africa**

A model for public libraries to address the digital divide in South Africa is proposed in this chapter.

**Chapter 8: Findings, recommendations and future research**

This chapter presents the summary of findings and recommendations of the study. It reaches a conclusion based on the findings and formulates recommendations, and includes suggestions for further research.

## 1.12. CONCLUSION

This chapter has served as an introductory to the bigger study. The chapter described the urgency of bridging the digital divide. It also briefly described what libraries can do to address the digital divide. The concept of the digital divide, as well as the challenges of addressing the digital divide, was briefly discussed. The research methodology was covered. The chapter ends by providing the division of chapters. A more detailed discussion of most of the aspects discussed in this chapter will be provided in the next three chapters.

# CHAPTER TWO: LITERATURE REVIEW ON THE CONCEPT OF DIGITAL DIVIDE – CONTEXTUALISED TO SOUTH AFRICA

## 2.1. INTRODUCTION

The study started in 2006 with the literature review shaping the research design and instruments for data collection, which was done in 2011-2012. Many publications have since appeared. Adding newer references would skew the context in which the study was planned. It is, however, very important to acknowledge such publications, changes and trends, and therefore Chapter 6 reviews the literature on the digital divide for the period 2013-2015. This gives a longitudinal perspective on the role of public libraries in bridging the digital divide.

The concept of digital divide is not exactly new. The background and problem statement to the concept of the digital divide was given in Chapter 1. In the late 1980s and early 1990s it was fashionable to talk of the information-rich and the information-poor. Then along came the publicly available internet and World Wide Web, which helped make visible the information gap between the "haves" and "have-nots" (Bach *et al.,* 2013; Cronin, 2002; Ruecker, 2012). The United Nations (1998) released a statement in April 1997 that the organisation was concerned about the deepening mal-distribution of access, resources and opportunities in the information and communication field. According to it the information and technology gap and related inequities between industrial and developing nations were widening. According to Shuva and Akter (2011), the growth in new technology exacerbated the already extreme difference between the rich and poor countries and between the rich and poor in each country, as well as between men and women in poorer countries. As explained in Chapter 1, the technological revolution divided populations into two groups: people having access to ICTs and people without it. This resulted in the digital divide.

Chapter 1 formed the introduction and gave an overview of the study. It also covered the following: aims and objectives of the study, theoretical basis and

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framework for the study, importance of what libraries can do, clarification of the concept of digital divide, challenges of bridging the digital divide, problem statement (which included the principal question) and sub-questions, the methodology, demarcation of the research, significance of the study and the division of chapters. Chapter 2 will build on this.

Chapter 2 addresses theories on the digital divide, and the literature review on the concept of the digital divide. The concept of the digital divide and different interpretations are addressed in more detail than in the previous chapter, dimensions of the digital divide, factors contributing to the digital divide, attempts to bridge the digital divide and the digital divide in South Africa are also addressed

Mobile phones such as smart phones were less prominent at the time of the initial literature review for the study. Early versions of smartphones appeared in the mid-1990s, but it was not until the early part of this century that they appeared on the market in the form people now know them (Bomhold, 2013; Dedzoe *et al.*, 2013; Little, 2011; Negi, 2014). The Blackberry took off in 2002, the Palm Treo offered web browsing that same year, and various less sophisticated phones could take photos, record voice and video, and offered relatively clunky videogames. Apple's iPhone, first launched in 2007, changed things and offered users many features of a personal nature (Little, 2011). The App Store within iTunes was launched in July 2008 and two years later, there were approximately 300 000 third-party (i.e. non-Apple) apps available, many of them free of charge (Little, 2011). Although the value of smart phones are acknowledged for present day attempts to bridge the digital divide they are not featuring in the initial literature review or in the research design and collection of data (discussed in Chapter 4). The uptake of smart phones in South Africa are, however, discussed in Chapter 6.

## 2.2. DIGITAL DIVIDE THEORIES

In order to determine a theory to underpin this study, some theories were reviewed to establish their relevance to the current study. The choice of theories for review was influenced by the principal research question. Theories relevant to the digital divide are suggested by Castells (2000), Chatman (1996), Easton and LaRose (2000), Giddens (1984), Hargittai (2002), Harrison *et al.* (1997), Hendrix (2005), Hersberger, (2002), Hilbert (2011), Hongladarom (2004), Mason and Hacker (2003), Oppong (2014), Rogers (1995), Van Dijk (1999) and Wood and Bandura (1989). Some of the popular theories discussed in these works with regard to the digital divide include:

    (a) Psychological theories

- Bandura (1962) on social cognitive theory
- Bandura (1986, 1997) on self-efficacy theory

    (b) Theories related to communication and adoption of innovations

- Rogers (1962) on diffusion of innovations
- Network society (Norris, 2003)
- Consumption theory (internet consumption model)
- Davis (1989) technology acceptance model

    (c) Theory of information ethics

- Hongladarom (2004) on Floridi's information ethics theory

    (d) Theory of information poverty

- Herberger (2002) on Chatman's theory of information poverty

    (e) Theory of justice

- Hendrix (2005) Rawls' theory of justice

    (f) Theory of social capital

- Chen's (2013) social capital theory

    (g) Communication development theory (Martinussen, 1997; Rist, 1997)

Although very important and useful, none of these theories, on an individual basis, fully met the aim of this study, namely to approach the challenge of the digital divide from the perspective of the managing bodies and services, and to

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determine the role they can play. As explained in Chapter One (section 1.3) the Thatcher and Ndabeni (2011) psychological model of e-adoption in the context of the digital divide was thus selected to guide this study. Their model incorporates several theories and models including Venkatesh *et al.*'s (2003) unified theory of acceptance and use of technology, social cognitive theory, self-efficacy, the innovation diffusion theory of Roger, and Musa's (2006) extension of the Technology Acceptance Model. Thatcher and Ndabeni's (2011) model highlights antecedents and relationships that can have an impact on the digital divide, awareness of the technology and the potential value of the technology, socio-economic factors, including the availability of infrastructure, in this case specifically ICT infrastructure, accessibility of technology, personal factors such as self-efficacy, expectations for outcomes, facilitators and impediments (this includes training options and technical support), usage intentions and cognitive appraisal, and usage behaviour and continuance intentions. This study specifically focused on the availability of ICT infrastructure, accessibility of technology, awareness of the technology, facilitators and impediments (including training options and technical support) and usage.

## 2.3. CONCEPT OF DIGITAL DIVIDE AND DIFFERENT INTERPRETATIONS

In Chapter 1 (section 1.5) a brief definition of the concept of the digital divide was provided. This section elaborates on the clarification of the concept. The reason for this is to assist in understanding the concept of the digital divide and to establish its meaning in terms of this study.

In the 1990s the digital divide was first defined as the disparity between the technologically advantaged and the technologically disadvantaged. In recent years definitions have been expanded to include the gap in access to the internet (Foley, 2006; Ruecker, 2012; *Towards Equality of Access*, 2004).

In addition to the discussion provided in Chapter 1 (section 1.5), the following definitions found in the literature will be reviewed to deepen understanding of the

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digital divide in order to serve as a foundation for the empirical work in this study, as well as the theoretical models to be suggested for public libraries in South Africa. The broad definition of the concept of digital divide is the gap that exists between those who have and those who do not have access to ICTs such as telephones, computers, the internet and other related services (Ani, Uchendu & Atsye, 2007:356). According to Ferro, Helbig and Gil-Garcia (2011) the digital divide is a simple separation between 'haves' and 'have nots'; the 'haves' have access to computers and the internet and the 'have nots' do not. Cullen (2003:247) defines the concept of digital divide as the metaphor used to describe the perceived disadvantage of those who are either unable or do not choose to make use of ICT in their daily lives. The *Digital Divide Network* (2004) defines the concept as the gap between those who have access to communication tools, such as the internet, and those who do not have access.

In addition, the digital divide refers to the gap between individuals, companies, regions and countries when accessing and using information and communication technology (Cilan, Bolat & Coskun, 2009). The American Library Association, Office for Information Technology Policy (2000) defines the digital divide as disparities based on economic status, gender, race, physical abilities and geographic location between those who have or do not have access to information, the internet and other information technologies and services. Mariscal (2005:410) defines the concept as the gap between individuals, households, business and geographic arrears at different socio-economic levels with regard both to their opportunities to access information and ICT, and to the use of such technologies for a wide variety of activities. This definition is echoed by the Organisation for Economic Co-operation and Development (OECD) (2011).

The term "digital divide" reinforces fundamental economic and social divides between and within countries and is threatening to exacerbate these inequalities further (Singh, 2012). Chen and Wellman (2004) also define the concept in terms of

inequalities in internet access and use, ranging from the global level to nation states, to communities and to individuals. The digital divide implies the gap − whether based on socioeconomic status, education, geography, age, ability, language, or other factors − between people for whom internet access is readily available and those for whom it is not (Jaeger *et al.,* 2012).

Table 2.1 presents three different approaches to the digital divide, which attempt to elucidate the concept further. These approaches are based on the work of Antonio and Tuffley (2014), Fink and Kenny (2003), Reddick (2012), Van Dijk and Hacker (2003), Warschauer (2004). Each of these approaches goes beyond access and indicates different views or sides of looking at the concept. According to Guomundsdottir (2005) (citing Van Dijk & Hacker, 2003) these approaches make one realise the complexity of the digital divide and how many factors one actually needs to consider. This realisation is essential for public libraries in South Africa wishing to make a successful attempt to bridge the digital divide.

The view depicted in Column 1 of Table 2.1 developed from the fact that Van Dijk and Hacker (2003) recognised four different kinds of barriers to access to ICT network connections. These are *mental access,* including lack of interest in technology and computer anxiety, *material access,* including access to computers and internet connections; *skills access,* including inadequate education or training, lack of user friendliness etc., and *usage access,* including the opportunities people have to access the technology (Antonio & Tuffley, 2014; Reddick, 2012). In terms of especially skills access and usage access, there is evidence that the digital divide is both widening and deepening (Van Dijk, 2005). These include skills to search, select and process information using a computer and network sources, as well as strategic skills such as filtering and analysing information.

According to Van Dijk (2006) and Reddick (2012), skills access is extremely unevenly divided among the populations of both developing and developed

societies. With regard to usage access, Van Dijk and Hacker (2003) argue that people with high levels of education and income tend to use database spreadsheets, bookkeeping and presentation applications. Significantly more people with lower levels of education and income favour simple applications such as word processing consultation, games and other entertainment (Van Dijk, 2006). This is also reflected in Table 2.1.

The view depicted in Column 2 of Table 2.1 developed from the work of Fink and Kenny (2003), Park and Lee (2015) and Song (2004). Fink and Kenny (2003), Park and Lee (2015) and Song (2004) identify three types of gaps: a gap in access, which includes a gap to access ICTs (such a gap is crudely measured by the number and spread of telephones or web-enabled computers), a gap in ability, including a lack of ability to use ICTs (this is measured by considering the skills base and the presence of numerous complementary assets such as distribution channels, customer support centres, marketing expertise and a gap in actual use, which implies a lack of access to various ICTs and other resources to be used).

Column 3 in Table 2.1 depicts Antonio and Tuffley (2014), Epstein, Nisbet, Gillespie (2011), Jaeger *et al. (*2012), and Warschauer's (2004) view of the digital divide. Antonio and Tuffley (2014) and Warschauer (2004) look at four divides based on physical resources, digital resources, human resources and finally social resources. Physical resources refer to access to computers and connectivity, whereas digital resources refer to the content and language used. Jaeger *et al.* (2012) and Warschauer's (2004) use of human resources is connected to education and literacy, whereas social resources are linked to access at macro-level, such as through institutions and communities. These are presented in Table 2.1.

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**Table 2.1: Different approaches to the digital divide concept (adapted from Guomundsdottir, 2005)**

| Antonio and Tuffley (2014), Epstein, Nisbet and Gillespie (2011), Reddick *et al.* (2012), Van Dijk and Hacker (2003): focus on barriers to access | Fink and Kenny (2003), Song (2004) and Park and Lee (2015): focus on gaps in access | Antonio and Tuffley (2014), Jaeger *et al.* (2012), Warschauer (2004): focus on different types of divide in terms of resources |
|---|---|---|
| **Mental access**<br>• Lack of elementary digital experience<br>• Lack of interest in computers<br>• Computer anxiety<br>• Unattractiveness of the new technology | **Gap in the impact of use**<br>• Measured by economic and financial returns | **Social resources**<br>• Lack of access to social and organisational (institutions) resources to use ICTs |
| **Materials access**<br>• No possession of computers and no network connections | **Gap in access**<br>• Access to ICTs crudely measured by the number and spread of telephones or web-enabled computers | **Physical resources**<br>• Lack of access to computers and connectivity |
| **Skills access**<br>• Lack of digital skills caused by insufficient user-friendliness and inadequate education or social support regarding acquisition of digital skills | **Gap in ability**<br>• Lack of use of ICTs measured by skills base, etc. | **Human resources**<br>• Lack of literacy skills and education |
| **Usage access**<br>• Lack of significant usage opportunities | **Gap in actual use**<br>• Lack of access to various ICTs and other resources | **Digital resources**<br>• Lack of use due to nature and scope of content and language in which content is available |

As noted earlier, addressing the digital divide is a very complex issue and it is difficult to gain an overall understanding of what actually constitutes the divide and what the real problem is when there are so many definitions and descriptions of the concept (Furstenburg, 2005; Weiss, 2012). Sikhakhane and Lubbe (2005) also mention the complexity of the digital divide, as it not only covers access to the internet, but encompasses anything that provides access to information and communication (e.g. computers connected to the internet, radios and television), as also reflected in the views depicted in Table 2.1.

In addition to the definition and arguments that have been presented in preceding paragraphs, the scope of the digital divide can be even further extended. According to Weiss (2012), the definition highlights a basic truth, namely that the ability to access and effectively use the technological resources that are reshaping our world and are vital to gainful employment is distributed unequally in contemporary societies. Furthermore, this inequality typically reflects traditional socioeconomic inequalities in income, education and race/ethnicity. Generally speaking, the technology "have-nots", disproportionately belonging to low-income households, are less educated, are members of minority groups or individuals with disabilities, are older, and reside in rural as opposed to urban areas.

According to Hubregtse (2005), the definition given by the World Summit on Information Society of 2003, which refers to the digital divide as the gap between those who can effectively use new information and communication tools, such as the internet, and those who cannot, is disappointing. He argues that the definition is too simplistic, but agrees that the most dramatic kind of digital divide is the global divide: some countries can use the internet and others cannot because of the simple fact that the indispensable technological infrastructure is lacking. He goes further by arguing that some countries do have, to some degree, the technological possibilities, but that they do not always allow freedom of information and communication to all people and consequently make the use of the internet impossible (internet access is highly controlled); examples are Cuba, Myanmar (formerly known as Burma) and China. Beginning in September 2011, the historically pervasive levels of internet censorship in Myanmar were significantly reduced. According to Taneja and Wu (2014), internet censorship in China is most developed and has garnered enormous attention internationally.

According to Kibaya (2005) and Kizza (2013), the concept (digital divide) brings to mind two worlds: one in which there is immediacy of access to information, characterised by information-based commercial opportunities and transactions; and another where there is no or very limited access to information,

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characterised by traditional opportunities and transactions of a kind to eliminate any possibility of competitive positioning in the 21$^{st}$ century.

Castells (1998) and Jaeger *at al.* (2012) emphasise that people of both rural and urban areas have long experienced social exclusion and other disadvantages and often share a number of characteristics. These include low income, poor education and low social class (Weiss, 2012). Bach, Zoroja and Vukši (2013), Bridges.org (2001), and Kizza (2013) point out that the digital divide can also be described as the differing imbalances that exist between countries that are in a fortunate position to reap the advantages of the information age and those who are not in such a position. Crede and Mause (2004), and Ferro, Helbig and Gil-Garcia (2011) indicate that the digital divide can also exist between males and females. More discussions on different dimensions of the digital divide will take place later in this chapter (section 2.3).

According to Gebremichael and Jackson (2006), there is no universally accepted definition of the concept of digital divide, but many of the widely accepted definitions share a common origin. They continue to argue that the digital divide, when viewed holistically, is but one component of the larger problem of information poverty, which in turn encompasses lack of access to emerging ICT, information infrastructure in general, skills to manipulate and use information and basic educational and cultural barriers. Bach, Zoroja and Vukši (2013) and Vehovar *et al.* (2006) argue that the concept (digital divide) has been used for almost a decade and typically relates to socio-demographic differences in the use of ICT.

Park and Lee (2015) and Warschauer (2002) also argue that bridging the digital divide is much more than just providing access to the internet and that it is embedded in a complex array of factors encompassing physical, digital, human and social relationships. Content and language, literacy and education, and community and institutional structure must all be taken into account if meaningful

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access to new technologies is to be provided. Bridges.org (2001) also emphasises that access entails more than just provision of computers and connections and that access goes beyond mere physical access and makes it possible for people to use technology effectively to improve their lives. The notion of the digital divide is very important because it can reveal inequalities across the global information society (Van Dijk, 2006), which affect the economic growth and development of individual countries (Gautam, 2014; Vu, 2011). It can be measured using a framework of questions to determine who (with which user characteristics) connects to what and how this occurs (Hilbert, 2011).

Arising from the literature on the definition of the concept of the digital divide that was outlined earlier, the following elements were noted as appearing in most definitions of the concept of digital divide: gap in access to internet, gap in use of ICTs, lack of access to information, lack of capabilities to use ICTs, inequality of access, and gap in technology ownership. These elements are depicted in Figure 2.1, which was developed by the researcher to capture issues raised in the preceding discussion.

**Figure 2.1: Elements of the concept the digital divide**
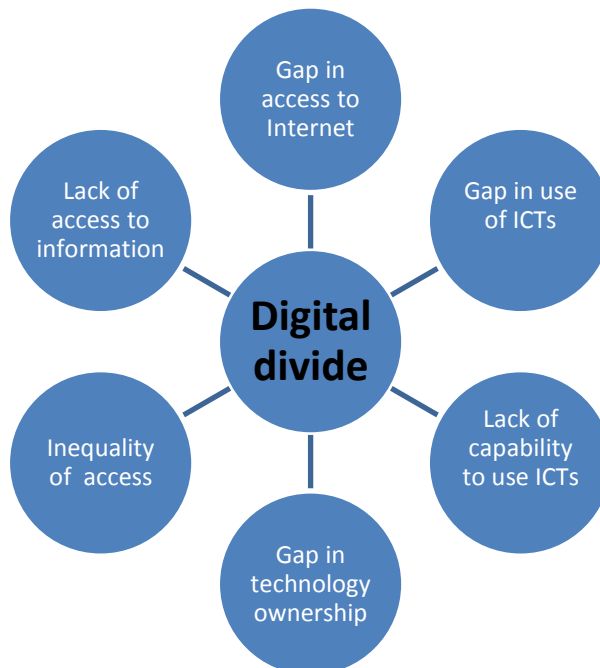
Apart from focusing on elements as reflected in Figure 2.1 when discussing the digital divide, some authors focus on the principles of the digital divide. Gebremichael and Jackson (2006:271) are of the opinion that most definitions of the concept of digital divide share the following important principles:

- Some gap in ICT adoption and access exists between developed nations, cultures and communities and their less developed counterparts (Gautam, 2014).

- Each nation, culture and community faces its own internal levels of information poverty. Damarin (2000) focuses on gaps and argues that there are definable gaps between:

  - Those who own state-of-the-art computers and subscribe to the internet;

  - Those who have access to computers and the internet at work, libraries or other locations and know how to use them;

  - Those who have minimal access to computing technologies and few reasons for using them.

Doong and Ho (2012) argue that the concept of the digital divide has two key components: granularity and content. Granularity refers to the level of entities such as individuals, businesses, countries and regions where the gap occurs. Content refers to activities that define the gap, for example, in terms of ICT development and use of the internet. As the range of ICTs and their capabilities increase, what constitutes the digital divide and how to measure it becomes even more unclear. It is possible to dispute the size, characteristics and reality of its existence and hard to measure any progress made with reducing disparities clearly (BECTA, 2011).

In the literature appearing since the start of the study (2006), as well as data collection, the older interpretations of the digital divide are often still repeated, such as that of Kularski and Moller (2012) as cited in Antonio and Tuffley (2014:674), describing the digital divide as a skills gap and a gap in physical access to information technology, or Varallyai, Herdon and Botos (2015), defining

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the digital divide in terms of the disparity between people in their access to ICTs or more specifically, disparity in terms of access to the internet. Basic 'readiness' indicators such as computers, TVs, mobile phones and internet access, however, feature more often in more recent publications (Kizza, 2013). Because of its multifaceted nature authors such as Epstein, Nisbet, Gillespie (2011), Ferro, Gil-Garcia and Helbig (2008, 2009, 2011), Nam and Stromer-Galley (2012), Middleton *et al.*, (2010), and Sourbati, (2009) argue that the concept cannot simply be described as a dichotomy between haves and have-nots (e.g. as done by Ani, Uchendu & Atsye, 2007; Ferro, Helbig & Gil-Garcia, 2011). According to Ferro, Helbig and Gil-Garcia (2011) a dichotomous view of the digital divide tends to neglect the influence of IT literacy and its impact on access. Weiss (2012) argues that although useful, simplified definitions of the digital divide seriously oversimplify a complex issue in several ways. To begin with, it dichotomizes society into users and nonusers.

Authors such as Barzilai-Nahon (2006), Epstein, Nisbet, Gillespie (2011), Hampton (2010), Park and Kim (2014) and Warschauer (2002) suggest that the digital divide be viewed as a continuum based on different degrees of access to information technology rather than being viewed as a dichotomy.

Because the digital divide is created by the emergence of new technologies, there is a need to be aware of its ever-changing nature. According to Weiss (2012), the specifics of the concept digital divide have evolved as the relevant technologies have improved. For example, the rapid global uptake of smartphones has, in part, remedied the problem of access to the internet (Park & Kim, 2014). A more detailed discussion on mobile access is provided in Chapter 6, which was written after data collection to give a longitudinal view of the meaning of the digital divide, challenges in bridging the digital divide and progress that has been made. At the start of this study and data collection, smartphones did not feature very strongly in South Africa

Although the preceding spectrum of interpretations was noted at the time of completing the study and proposing frameworks for the role of public libraries in future, the study and data collection were guided by the interpretation of the digital divide as a gap between people who have access to ICT and do not have the necessary skills to use such technology, people who have access to ICT but do not have the necessary skills to use such technology despite their willingness to learn, people who have access to ICT but do not have the necessary skills to use such technology and have no desire to learn, people who do not have access to ICT but wish to have such access and to learn the necessary skills to use technology, and people who do not have access to ICT and do not want to learn the necessary skills nor use the technology.

For research on the digital divide, it is also imperative to explore different dimensions of the digital divide. The next section aims to provide more insight into the different dimensions of the concept of digital divide.

## 2.4. DIFFERENT DIMENSIONS OF THE CONCEPT OF DIGITAL DIVIDE

As explained in Chapter 1 (section 1.3), the digital divide has also been identified along a number of dimensions. Bruno *et al.* (2011), Gautam (2014), and Norris (2001) describe the digital divide as a multidimensional phenomenon comprising disparities. According to the World Information Society Report (2007) there is not a single divide, but multiple divides; for instance within countries, between men and women, between the young and the elderly and between different regions, etc. (This is also noted in the preceding section.) Different dimensions of the digital divide are recorded in the literature. Authors such as Adebesin and Kotze (2012), Adeogun (2003), Ani, Uchendu and Atseye (2007), Alsa, Williamson and Mills (2006), Doong and Ho (2012), Gautam (2014), Fink and Kenny (2003), Guomundsdottir (2005), Millard (2003), Nom and Stromer-Galley (2012), Pigato (2001), Kibaya (2005), Riley (2004) and Sandor (2005) have discussed dimensions of the digital divide. These dimensions are depicted in Figure 2.2, which was developed by the researcher.

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**Figure 2.2: Different dimensions of the digital divide**
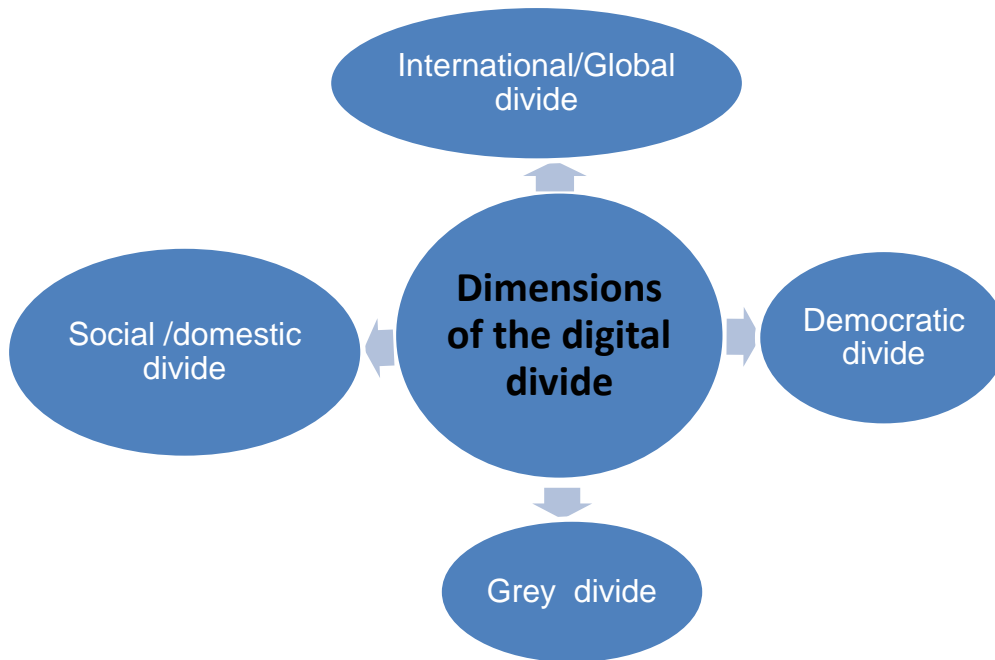


In addition to the brief reflection on dimensions of the digital divide provided in Chapter 1 (section 1.3), the concept of digital divide will now be further interpreted along the following broad categories of dimensions as noted in the literature:

- **International/global divide**: The international digital divide is sometimes also referred to as the global digital divide. This is the type of divide where connectivity and use of the digital technology vary between countries or cultures around the globe. Disparities also exist in access to and use of ICT between countries. Such a divide currently exists within nations and between developing and developed countries. This divide is based on an infrastructure problem. In developing countries, most people besides wealthy individuals cannot currently afford the technology to access information, even when it is available, so usage remains low (Adeogun, 2003; Anaraki & Heidari, 2010; Ani, Uchendu & Atseye, 2007; Bach, Jovana Zoroja & Vukši, 2013; Blake & Tucker, 2005; Doong & Ho, 2012; Gautam, 2014; Guomundadottir, 2005;

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Kibaya, 2005; Kizza, 2013; Loo & Ngan, 2012; Norris, 2001; Pigato, 2001; Riley, 2004; Sandor, 2005; Shuva & Akter, 2011; Warschauer, 2002).

- **Social/domestic divide:** This type of divide occurs between the haves and have-nots and the users and non-users of ICTs within more developed countries. This refers to where the connectivity and use of digital technology varies within a nation. This can result in a significant gap between those who do and those who do not have access to adequate levels of ICT trends, especially in the social aspects of the digital divide in relation to occupation, age group and gender. It is argued that the social digital divide can operate in two distinct poverty-stricken areas, namely rural locations (Di Maggio *et al.*, 2001) and inner city areas (Castells, 1998). Access within countries can be looked at according to the following socio-economic factors: age, income, geographical location, education, race, gender, disability (Bach, Jovana Zoroja & Vukši, 2013; Blake & Tucker, 2006; Castells, 1998; Di Maggio *et al.*, 2001; Doong & Ho, 2012; Fink & Kenny, 2003; Gautam, 2014; Mahmud, 2002, Norris, 2001; Kizza, 2013; Loo & Ngan, 2012; Sandor, 2005; Shuva & Akter, 2011; Riley, 2004; Warschauer, 2002).

- **Grey divide:** This refers to the digital divide between the young and elderly people (Asla, Williamson & Mills, 2006; Kumar, 2005; Millard, 2003; Paul & Stegbauer, 2005). Some of the reasons why elderly people do not use the internet include fear of new technology, lack of trust, concerns about data security and feeling too old (Morris & Brading, 2007). Older people are sometimes isolated from communication streams such as the internet by changes in their circumstances, such as illness, incapacity and becoming a caregiver (Swindell, Grimbeek, & Heffernan, 2011).

- **Democratic divide:** The democratic divide concerns the differences within the online community of users who either choose to use technology, or not, "to engage, mobilise, and participate in public life" (Norris, 2001; Pluss, 2009; Gautam, 2014; Min, 2010; Nam & Stromer-Galley, 2012; Weiss, 2012).

The above-mentioned are broad categories attempting to cover most of the dimensions of the digital divide. Global and domestic divides can be associated with the geographical effects (i.e. north and south, rural versus urban) of different countries. The social dimension can be considered with regard to societal access to public information and the internet. Aspects such as cultural implications, ethnicity and gender issues can be associated with this dimension. This brings one to the factors contributing to the digital divide that will be discussed in the next section.

## 2.5. FACTORS CONTRIBUTING TO THE DIGITAL DIVIDE

As indicated in Chapter 1 (section 1.4), a number of factors are contributing to the concept of the digital divide. This section offers a literature review on such factors. Before one can address the ways of bridging the digital divide, it is essential first to identify the factors that contribute to the digital divide. Authors such as Adebesin and Kotze (2012), Alemna (1998), Cullen (2001), Ferro, Helbig and Gil-Garcia (2011), Hassler and Jackson (2010), Jaeger *at al.* (2012), Kiplang'at (2002), Kizza (2013), Moyo, (1996), Middleton and Chambers (2010), Munyua (2000), Pigato (2001), Opoku-Mensah (2004), Reddick, Abdelsalam and Elkadi (2012), Sheba (1998) and Shirazi *et al.* (2010) have done research on the factors that hamper the development of ICT in African and developing countries. Factors identified in these studies include lack of physical access, physical disabilities, lack of skills and support, gender, language, education, income, legal and regulatory issues, racial segregation, content, age and attitudinal barriers. These factors are closely linked to the interpretations of the concept of digital divide, as well as the dimensions to which it is linked. These factors are depicted in Figure 2.3, which was developed by the researcher. All factors are explained in more detail after the figure.

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**Figure 2.3: Factors contributing to the digital divide**
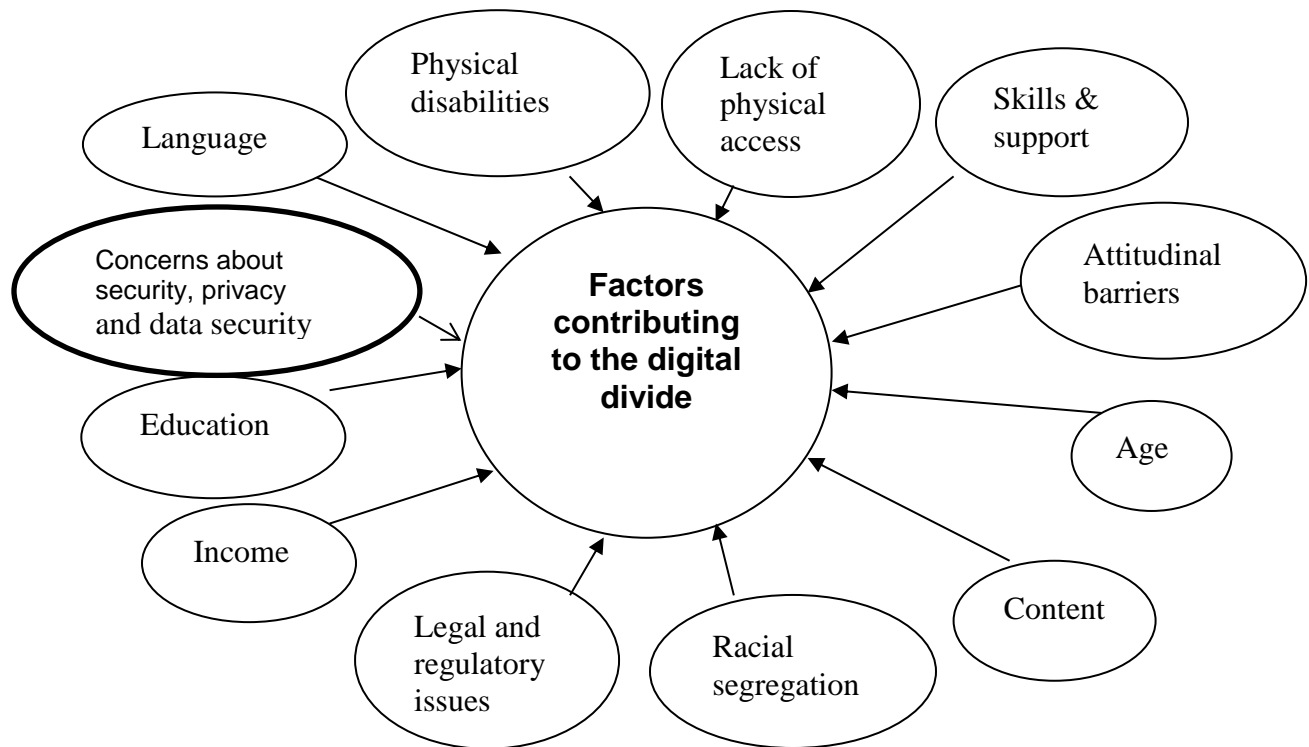


From Figure 2.3, it is evident that there are a number of factors that may be considered to be contributing to the concept of the digital divide. Some factors overlap with what was discussed earlier in this chapter. These factors are described as follows:

- **Lack of physical access to ICTs:** Aspects included here are lack of telecommunication infrastructure for internet connections, cost and lack of the necessary equipment (Adebesin & Kotze, 2012; Ba, 2001; Bridges.org, 2001; Caspary, 2002; Cullen, 2003; Hawkins, 2005; Loo & Ngan, 2012; Middleton & Chambers, 2010; Munyua, 2000; Pigato, 2001; Reddick, 2012; Varallyai, Herdom & Botos, 2015; Wilson, 2006).

- **Lack of skills and support:** People in many of the disadvantaged groups are often prevented from making use of ICTs because of low levels of computing and technology skills, and also, very importantly, literacy skills (Cullen, 2001; Cullen, 2003; Ferro, Helbig & Gil-Garcia, 2011; Munyua, 2000; Pigato, 2001, Van Dijk & Hacker, 2003; Varallyai, Herdom & Botos, 2015).

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- **Attitudinal barriers:** Closely aligned with lack of skills and support are cultural and behavioural attitudes to the technology, e.g. that computers are for "brainy" people, for males, for the young, are difficult to use, or belong to a middle-class "white" culture (Cullen, 2001, Ferro, Helbig & Gil-Garcia, 2011).

- **Age:** A digital divide exists between age groups because the youth are more exposed to technology and are willing to use it, whereas older people are often resistant to change and avoid the use of technology (Jaeger *et al.,* 2012; Millard, 2004; Morris, Goodman & Brading, 2007; Reddick *et al.*, 2012; Shuva & Akter, 2011; Singh, 2004; Shirazi *et al.,* 2010; *Toward Equality of Access*, 2004; Varallyai, Herdom & Botos, 2015).

- **Content:** This is one of the main reasons why some groups choose not to access the internet: because the content is not relevant or interesting to them. Content is published mostly in English (Adebesin *et al.*, 2010; Foley *et al.*, 2002). This may apply to specific groups in society, such as the elderly or women, but more significant again, to cultural, religious or ethnic groups outside the predominantly Western culture of the internet (Adebesin & Kotze, 2012; Ba, 2005; Ballantyne, 2002; Batchelor, 2002; Bridges.org, 2001; Caspary, 2002; Cullen, 2003; Obeidat & Genoni, 2010).

- **Concerns about security and privacy:** Research by Morris (2007) found that one of the reasons why people, particularly older people, will not use the internet is concerns about security and privacy issues. According to Morris (2007), a high proportion of both older users and non-users expressed concern about security and privacy issues. Concerns, fuelled by the media, include other people being able to obtain access to their data, people being able to spy on their activities, getting viruses and being open to fraud, especially when shopping online (Morris, 2007).

- **Racial segregation:** The separation in education between blacks and whites in South Africa during the apartheid era contributed to the digital divide. This is also prevalent in other countries where racial segregation was or is a policy (Shirazi *et al.,* 2010; Singh, 2004; Varallyai, Herdom & Botos, 2015).

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- **Low income:** Ownership/use of personal computers and internet penetration rates both increase with high income levels. Households at higher income levels are more likely to own computers and have access to the internet than those at low income levels (Compaine, 2001; Jaeger *et al.,* 2012; Loo & Ngan, 2012; Kizza, 2013; Reddick, Abdelsalam & Elkadi, 2012; *Toward Equality of Access*, 2004; Varallyai, Herdom & Botos, 2015).

- **Education:** Access to information resources is closely tied to levels of education. Households at higher educational levels are far more likely to own computers and have access to the internet than those at low educational levels (Castels, 2002; Compaine, 2001; Hassler & Jackson, 2010; Jaeger *at al.,* 2012; Kizza, 2013; Reddick *et al.*, 2012; Shuva & Akter, 2011; *Towards Equality of Access*, 2004; Varallyai, Herdom & Botos, 2015).

- **Legal and regulatory framework issues:** These issues refer to appropriate laws and regulations that are not conducive to ICT utilisation and limit the effective use of ICTs (Ba, 2005; Bridges.org, 2001).

- **Language:** Language can become a significant barrier in bridging the digital divide. The use of the English language as the main language of interacting with computers enhances the digital divide. According to an estimate by Internet World Statistics (2012), English ranked highest among the top ten internet languages used. Furthermore, large proportions of indigenous people in Sub-Saharan Africa can neither read nor write (UNESCO, 2006). As potential users of computers, they are increasingly marginalised (Adebesin, 2012; Bridge.org, 2002; Fernandes *et al.*, 2007; Jaeger *et al.,* 2012; Modoux, 2002; Mutula, 2002; Obeidat & Genoni, 2010).

- **Physical disability:** Physical abilities also affect the use of ICTs. Though visually impaired and blind persons are able to use computers because of advances in assistive technology such as Jaws, which is one of many screen reader technologies, some visually impaired people without these resources are excluded from using information in electronic format and therefore marginalised (Jaeger *et al.,* 2012; Shuva & Akter, 2011; Singh, 2004). Screen readers are voice synthesisers that can read the text on the screen.

The next section will provide a discussion on attempts to bridge the digital divide.

## 2.6. ATTEMPTS TO BRIDGE THE DIGITAL DIVIDE

The first step towards bridging the digital divide is to understand the divide itself, in the context of the local situation being addressed: what it is, why it exists, who has access, what restrictions are there on access and how it affects or has affected local communities over time (Kibaya, 2005; Ruecker, 2012). An attempt to gain such an understanding of the issues at stake in general has been made in the preceding sections. This section reviews the literature on attempts to bridge the digital divide.

A number of attempts to bridge the digital divide have been recorded in the literature. Cullen (2001), and Reddick, Abdelsalam and Elkadi (2012) suggest that any attempt to address the digital divide must take potential barriers into account if it is to succeed. An increasing number of civil society organisations, non-governmental organisations and governments have come up with strategies to reduce the digital divide (Adebesin *et al.*, 2010; Adebesin & Kotze, 2012; Kibaya, 2005; Kizza, 2013; Loo & Ngan, 2012). For example, Moahi (2003) and Kizza (2013) report on a number of governments in Africa being eager to provide universal access and designating ICT as a priority sector in their development agendas; this could then lead to all citizens having access to technological infrastructure, enabling them to take advantage of all the opportunities that the digital era heralds.

Fors (2003) and Kizza (2013) argue that, in order to bridge the digital divide in developing countries, the infrastructure must be improved. In terms of access to personal computers and the internet, the digital divide is closing in developed countries, whereas in developing societies it is still growing (Nancer & Hacker, 2003). Attempts to bridge the digital divide should not focus only on providing infrastructure. To support this statement, Fernandes *et al.* (2007), Reddick, Abdelsalam and Elkadi (2012) argue that governments have already recognised

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that it is not just about infrastructure; empowering the rural masses to leverage such technologies by educating people is also absolutely essential. According to Shuva and Akter (2011) coordinated, long-term and effective programmes to reduce the digital divide will ensure peaceful, educated, qualified and ICT competent future generations.

In some instances it is vital to begin the attempt to address the digital divide by first solving other problems, for example, increasing the literacy rate. If people cannot read or write, merely providing them with computers and access to the internet might not help. As was advised by Warschauer (2003), for a nation to develop, the level of literacy must be lifted to bridge the digital divide. He continued to state that people in developing countries have lower levels of literacy compared to those in developed countries. This implies that a lot of literacy programmes must be initiated in order to educate people.

Table 2.2 reflects some of the key attempts, representing different countries, to address the digital divide. Since the intention with the table is only to indicate that initiatives are taken on a global scale, as well as to reflect the diversity of initiatives, extensive effort was not made to update the table, with a few exceptions. Most of these attempts were noted at an early stage of the study. Although the choice of countries was based on random selection, the balance between the developed and developing countries was taken into consideration. The countries are discussed in alphabetical order.

**Table 2.2: Examples of attempts to bridge the digital divide**

| Country | Attempt to bridge the digital divide | Source (s) |
|---|---|---|
| Australia | The government initiated a project to provide access to the internet by the general public via public libraries. There has also been an initiative to get computers and internet access into schools across the country. Another programme initiated as part of Networking the Nation's programme was the Community Technology Centre at New South Wales initiative. The objective of this initiative was to provide seed funding for townships and centres in metropolitan areas to establish community technology centres. | Back & Atikson (2007), De Weaver & Ellis (2006),*The digital divide in Sydney* (2005), Samaras (2005) |
| Brazil | The government initiated the National Research Network for IT programmes. | Cassiolato & Lastres |

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| | It became the platform in using internet technology, becoming a wider service provider. Another programme, known as the Information Society Initiative, was aimed at expanding the internet infrastructure, facilitating the interconnection of all public libraries and creating thousands of community access centres throughout the country. It was also aimed at promoting computer literacy with free learning material and courses. | (2005), Voelcker & Novais (2012) |
|---|---|---|
| China | The government launched the Develop Great Western Regions initiative in the early 2000s; one of the objectives of this programme was to connect all administrative villages by telephone. The development of telecentres that significantly improved accessibility of low income households proved very effective. The Chinese government pledged to invest RMBf200 million to narrow the digital gap between the eastern and western regions. | Zhu (2006), Loo & Ngan (2012) |
| Cyprus | The ICT infrastructure in schools was improved and teachers were trained in ICTs. The educational curriculum was reformed to include the use of ICT tools and civil servants were given ICT training. | *Annual Information Society Report* (2007) |
| Egypt | The government launched a Technology Development Centre, which was meant to establish multimedia centres and computer laboratories in schools and to develop educational software. | Reddick, Abdelsalam & Elkadi, Wanas (2012), Warschauer (2003), (2012) |
| France | The Aijalcom project introduced community technology learning centres for youth in underserved areas and preparing youth to join the workforce, increasing computer literacy and supporting local socioeconomic development. | http://membres.multimania.fr /ajialcom; UN E-government Survey (2012) |
| Germany | The ID 2010 project was initiated in late 2006, combining measures to increase the innovative capability and competitiveness of the German ICT sectors with a strategy for e-Government, e-Security, e-Inclusion and the promotion of ICT use in the population. | *Annual Information Society Report* (2007); Schleife (2008) |
| Hungary | A number of projects have been set up to support business and household use of ICT. These include projects to promote online access to government services, particularly in the field of taxation, one-stop shops for businesses and healthcare administration and the Digital National Library programme, which aims to digitise and make accessible national content resources | *Annual Information Society Report* (2007) |
| Korea | The different digital divide initiatives and interventions in Korea were made with public-private-partnership (PPP) frameworks. The PPP consisted of over 679 individual members from different sectors of the economy. Some of the major interventions put in place by the PPP arrangements in Korea such as a high speed information infrastructure project ; the 'Cyber Korea 21' programme which focused on digital mobile migration and mobile Internet service; the 'e-Korea Vision 2006' which laid the foundation of e-Government and initiated the world's first IMT-2000 service (third generation (3G) wireless technology for higher data rates between mobile phones and base antennas); the broadband convergence network (BcN) implementation plan; and theu-Sensor network and IPv6 Master Plan. | Noh (2009); Sedimo, Bwalya & Du Plessis (2011). |
| Italy | In the area of broadband, Italy aims to reduce the digital divide through public investment in disadvantaged areas with the objective of bringing fixed and wireless connectivity to 80% of populations living in the south of the | *Annual Information Society Report* (2007) |

| | | |
|---|---|---|
| | country. Specific measures have been taken to stimulate investment by the ICT sector through the setup of technological districts and platforms. | |
| India | The government launched a pilot project, namely the Grameen Sancahar Sewak project. The project has been conceptualised to provide accessibility of public telephones to rural people, using wireless technology. The state also established about 7 800 information technology kiosks with the help of the private sector. Public instruction centres were identified to train people incomputer literacy and the government involved public libraries in the projects. | Fernandes (2007), Singh (2007) |
| Lithuania | Within the Rural Broadband Network of Information Technologies scheme, the deployment of broadband was supported and access was initiated for public authorities, hospitals, schools and museums, as well as for citizens and businesses in rural areas. The General Computer Literacy Programme and the Programme of Social Integration of Disabled People were implemented while schools were provided with computers. ICT use was fostered through the programme, "Development of Rural Internet Access Points". | *Annual Information Society Report* (2007) |
| Mexico | Between 2000 and 2006 the government initiated efforts to address the digital divide. A programme called E-Mexico (www.e-mexico.gob.mx.) opened over 3 200 digital community centres around the country. The programme aimed at integrating Mexicans into the information society | Mariscal (2005) |
| Namibia | The government invested in ICT to promote digital literacy in schools throughout the SchoolNet project (www.schoolnet.za). SchoolNet was established in February 2000, with the aim of bridging the digital divide by introducing computer technology and internet access to schools with the help of a number of local and international stakeholders. | James & Louw (2012), Mutula (2004) |
| Nepal | Through the Coppades programme, the following was implemented: ICT infrastructure and connectivity to rural public schools, solar power enabled online education project for rural schools with no connectivity to the electricity grid and connecting schools and students through email and their newly created school websites. | http://www.coppades-nepal.org; UN E-government Survey (2012) |
| Netherlands | Among several programmes to increase the use of ICT, two important ones are: Connecting the Dots (closer integration of local initiatives) and the new ICT Regie (strengthening and focusing ICT research). A new Social Sectors and ICT Action Programme was initiated in 2005. The programme aims to employ ICT in order to improve mobility in urban areas and to increase the attractiveness and quality of education. Increased use of ICT by small and medium enterprises was also targeted by other initiatives, such as-Netherlands goes Digital, Netherlands Digital, Ground breaking with ICT and Widescreen Television throughout the Netherlands. | *Annual Information Society Report* (2007) |
| Portugal | In order to promote ICT use, the Portuguese government implemented tax rebates. Since December 2005 the purchase of computers has been supported through tax rebates for families with students. An additional project with a total budget of 200 million Euros was allocated to promote ICT take-up, use and ICT industries in the regions of the country. Measures included the training of teachers in basic and secondary education in ICT | *Annual Information Society Report* (2007) |

| | and the integration of ICT in their curricula. In 2005 all public schools were connected to broadband. | |
|---|---|---|
| Slovakia | ICT issues are included in the curricula at all levels of education; teachers have been given training on the use of ICT in the educational process and schools have been provided with the necessary infrastructure. To promote digital literacy, the 'Stur's Movement' project funded ICT training for local communities. Some legislative action was taken to support electronic commerce and developments in electronic communications. | *Annual Information Society Report* (2007) |
| Slovenia | Public internet access points were set up where vocational and secondary education was being restructured to emphasise ICT. Work on a 'Digital Library of Slovenia' began in 2005. | *Annual Information Society Report* (2007) |
| Uruguay | Through Plain Ceibal project the followings were implemented: laptop to every student enrolled in the public school system, adaptive technology in the laptops for students with special needs, co-ownership through engagement of students/parents in design, aiming at adaptive technologies en masse and at reduced cost. | http://www.ceibal.org.uy |

The preceding description of attempts by a selection of countries to bridge the digital divide proves that countries realise the challenges posed by the digital divide. For countries to achieve their goals on bridging the digital divide, they need to work with other sectors, such as the private sector and non-government organisations (Bishop *et al.*, 1999; Kizza, 2013; Osunkunle, 2010). The private and other sectors can play a huge role in bridging the digital divide, and there are great opportunities in the area of public-private partnerships (PPPs) to help achieve this. Great emphasis is therefore placed on governments collaborating with other relevant stakeholders. A number of good examples have been reported in this regard. Gebremichael and Jackson (2006) report on collaboration between the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the United Nations Development Programme (UNDP), and British Council and Ethiopian agencies to open community multimedia centres throughout different countries in Africa, e.g. Ghana and Ethiopia. The telecentres provide access to information via various electronic resources, community networking and development. The community centres are part of UNESCO's efforts to help fight information poverty throughout the world's poorest regions.

Barriers such as geographical locations, revenue, language and lack of education, as discussed in this chapter (section 2.5), also affect business (World Bank, 2012). According to Fernandes *et al*. (2007), those who are disadvantaged by virtue of location generally live in poor, developing countries, especially in rural areas where infrastructure to support the use of information technology is limited. The next section reports on the status of the digital divide in South Africa.

## 2.7. DIGITAL DIVIDE IN SOUTH AFRICA

As briefly indicated in Chapter 1 (section 1.1), South Africa is facing many of the challenges already noted. South Africa chose its first democratically elected government in 1994, and since then reference has often been made to the "new South Africa" (Guomundsottir, 2005; Naidoo & Raju, 2012). In this section reported literature will be assessed to review the impact of the digital divide in South Africa. This section will address the following aspects: brief overview of the South African context, internet usage in South Africa, factors contributing to the digital divide that are specifically mentioned with regard to the South African context, and attempts to bridge the digital divide.

Many people anticipated that new policies and firm measures of redress would contribute to the creation of a more equitable and fair society in order to enable South Africa to become a player in the global economy (Czerniewicz, 2004). Examples of new policies are the South Africa Science and Technology Human Capital Development and Public Private Partnerships policy (Czerniewiz, 2002; OECD, 2011). An example of a firm measure of redress is the Affirmative Action and Skills Development Act (OECD, 2011). The following sub-sections give a brief overview of South Africa.

### 2.7.1. Country overview

South Africa has a population of 50 million (Statistics South Africa, 2012). It has nine provinces (see Figure 2.4) and 11 official languages. South Africa has a rich culture, linguistic profile and ethnic diversity. According to Guomundsdottir

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(2005), the cultural background of the people is reflected in their different languages, behaviours and traditions. It is home not only to South Africans, but also to immigrants from different parts of the world. Since the late 1990s, asylum seekers have come in great numbers from such countries as the Democratic Republic of Congo, Somalia, Burundi, Rwanda and Ethiopia, to name but a few (Tati, 2008). Concurrently to this movement of populations, the country is experiencing massive emigration of skilled labour to developed countries such as the United Kingdom, Australia, New Zealand and the United States (Tati, 2008).

In addition to the 11 official languages (i.e. Afrikaans, English, Ndebele, Northern Sotho, Sotho, Swazi, Tswana, Tsonga, Venda, Xhosa and Zulu), several local dialects (i.e. fanagalo, lobedu, setlokwa, Khoi, Nama and San languages) and foreign languages (i.e. Arabic, German, Greek, Gujarati, Portuguese, Hindi) are also spoken here (Wikipedia, 2013). According to Statistics South Africa (2012) the mid-2011 population was estimated at 50, 59 million. Africans were in the majority (about 40.2 million) and constituted 79, 5% of the total South African population. The white population was estimated at 4, 5 million, the coloured population at 4, 5 million and the Indian/Asian population at 1, 2 million (GCIS, 2012; Statistics South Africa, 2012). A map of South Africa is presented in Figure 2.4. The map was developed by a geographic information system (GIS) specialist at the request of the researcher.

**Figure 2.4: Map of South Africa**
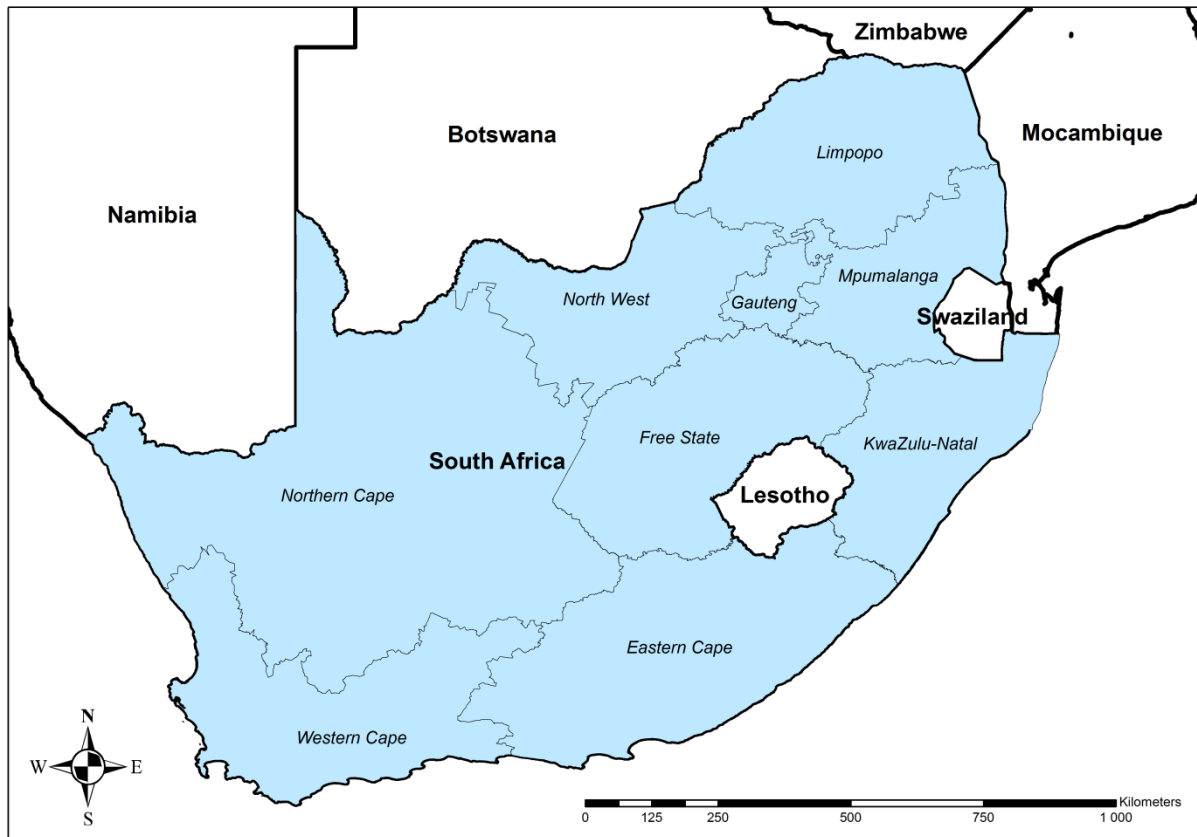


The economy is of medium size, with gross domestic product (GDP) of United States dollars (USD) 555 billion (CIA, 2011). The country ranks as a middle income country in terms of the GDP per capita, estimated at USD 5 916.46 in 2013. However, the South African society remains characterised by extreme income inequality, with high levels of structural unemployment and a large percentage of the population living in poverty (Lewis, 2007). This is affirmed by Mbuli (2008) who argues that South Africa is characterised by inequalities and that the country is disfigured by widespread poverty. Ukpere (2011) points out that unemployment in South Africa is understated, as an increasing number of graduates have become desperately willing to accept lower paying jobs. The next subsection will provide more insight into the status of ICT in South Africa.

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## 2.7.2. ICT status

ICT indicators are used to measure how widely diffused and accessible (i.e. real access, profiled by proximity, language and cost) ICTs are across all regions and sectors of society (Hanafizadeh, 2011). It further measures how ICTs are being used by individuals, households, communities, government, the business sector and civil society to improve their lives or operations (Lewis, 2007; Mutula & Mostert, 2010; SADoC, 2011). Some key ICT indicators are presented in Table 2.3. The statistical data are combined from various sources such as the Central Intelligence Agency (2011), GCIS (2012), Fuchs and Horak (2008), ITU (2011), Lewis (2007), Telkom (2007), UNDP (2012), SADoC (2006), and Statistics South Africa (2012).

According to the *Global Information Technology Report* (2012), South Africa is ranked in the 72nd place on the Network Readiness Index. The Network Readiness Index is used to measure the degree to which economies across the world leverage ICT for enhanced competitiveness (*Global Information Technology Report*, 2012). In addition, it has identified best practices in networked readiness and designed roadmaps and strategies for establishing optimal ICT diffusion to boost competiveness (Global Information Technology Report, 2012).

Each year since 1990 the Human Development Report has published the Human Development Index (HDI), which was introduced as an alternative to conventional measures of national development, such as level of income and the rate of economic growth (Fuchs & Horak, 2008; UNDP, 2013). The HDI represents a push for a broader definition of well-being and provides a composite measure of three basic dimensions of human development: health, education and income (UNDP, 2013). South Africa's HDI is 0.619, which gives the country a rank of 123 out of 187 countries (UNDP, 2013). The HDI of Sub-Saharan Africa as a region increased from 0.365 in 1980 to 0.463 in 2013; placing South Africa above the regional average (UNDP, 2013). This represents a decline from 121 out of 177

countries in 2011, suggesting the considerable challenges facing South Africa in improving the quality of life of its citizens (UNDP, 2013).

South Africa's telephone industry has historically been separated into fixed line and mobile cellular. Fixed line service providers are Telkom and Neo Tel, the latter entering the market in December 2005 after receiving a license (iAfrica, 2007; Fuchs & Horak, 2008; Lewis, 2007; ITU, 2012; GCIS, 2012; Mutula & Mostert, 2010). The mobile telephone market in South Africa is substantially larger than fixed line services (GCIS, 2012). South Africa has five mobile operators: Vodacom, MTN, Cell C, Virgin Mobile and 8ta (subsidiary of Telkom) (DoC, 2012; GCIS, 2012; Fuchs & Horak, 2008; Lewis, 2007; Mutula & Mostert, 2010).

In order to reflect some of the ICT indicators, Table 2.3 was compiled from a selection of sources. In must be noted that this is what applied at the time of planning the study. The newer details on these indicators will be provided in Chapter 6, which was written after data collection and analysis.

**Table 2.3: South Africa's ICT indicators (CIA, 2013; ITU, 2012; UNDP, 2012; GCIS 2012; Statistics South Africa, 2013; Telkom, 2013)**

| Indicators | Figures |
|---|---|
| Population | 50.59 million |
| GDP | USD 555 billion |
| GDP per capita | USD 5 916.46 |
| GINI co-efficient | 57.8 |
| Main (fixed) telephone lines | 4 729 000 |
| Teledensity or telephone subscribers (fixed) | 68.2% |
| Number of fixed line operators | 2 |
| Mobile telephone subscribers | 39  066 000 |
| Number of smartphone subscribers | 10 million |
| Teledensity (mobile) | 68.2% |
| Internet subscribers (estimated) | 5 300 000 |
| Broadband Internet subscribers | 283 839 |
| Number of personal computers | 5 300 000 |
| Number of Internet service providers | 355 |
| Number of television sets | 10 000 000 |

| Number of televisions stations | 6 |
|---|---|
| Number of radio stations | 196 |

Prior to 1990, ICT services in South Africa were the sole responsibility of the state, beginning with broadcasting, commissioned to the South African Broadcasting Corporation (SABC) (Lewis, 2007). In 2004, the Department of Communications redefined the Electronics Communications Act, which consolidated and redefined the landscape of telecommunications licensing in South Africa (both mobile and fixed). The Independent Communications Authority of South Africa (ICASA) currently licenses more than 400 independent operators with the Electronic Communications Network License (with the ability for self-provision) as well as issuing electronic communications service licenses for service deployment over infrastructure in the retail domain (DoC, 2011; GCIS, 2012; ICASA, 2012).

According to the Government Communications and Information Systems (GCIS) (2012), the ICT market has grown by R187 billion since 2007. It is estimated that the sector will grow to R250 billion by 2020. This growth will be driven by the rapid uptake and use of data and applications-driven mobile communications (DoC, 2011: GCIS, 2012). The next subsection will provide statistics on the use of the internet in Africa and more specifically in South Africa.

### 2.7.3. Internet use in Africa and South Africa

Using the internet has become popular in South Africa, just like in many other parts of the world, with a huge number of people using the internet daily. In Africa as a whole only 7% of the total population has access to the internet (*Internet World Statistics*, 2012). In South Africa around 17.4% of the population has access to the internet (*Internet World Statistics*, 2012). Compared with other countries in the world, South Africa has a low percentage of people with access to the internet. The United Kingdom has 83.6% internet penetration, the United States of America has 78.1%, Australia has 88.8%, Japan has 79.5% and the United Arab Emirates has 70.9% (Internet World Statistics, 2012).

According to the GCIS (2012), many South Africans still rely on broadband services at their place of work to access the internet, hence broadband penetration stands at approximately 5% of the population (DoC, 2011;GCIS, 2012).

The top ten countries in Africa with the highest number of internet users are presented in Figure 2.5.

**Figure 2.5: Top ten countries in Africa regarding internet access (*Internet World Stats*, 2012)**
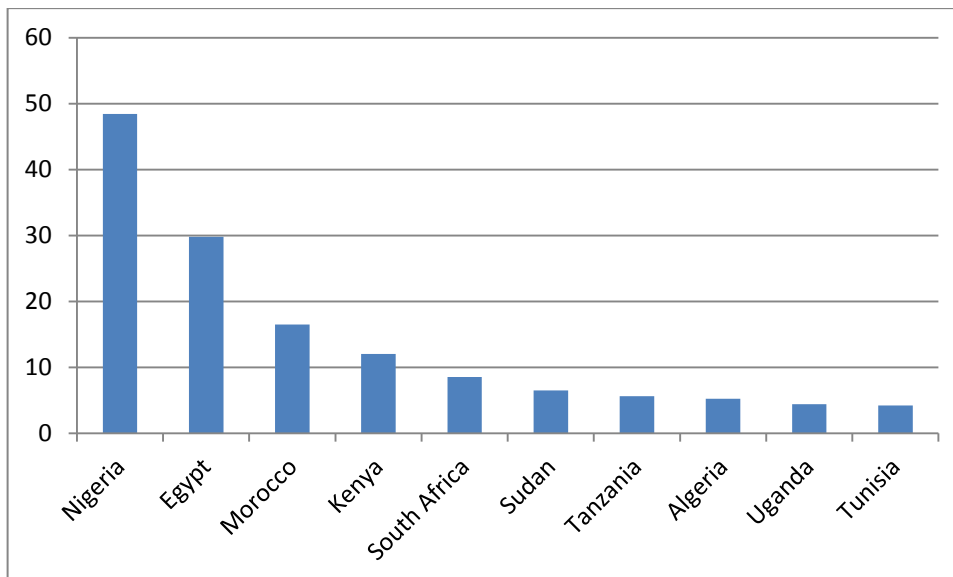


As depicted in Figure 2.6, South Africa, with 8.5%, ranks number five out of ten African countries in terms of internet users. Other countries with higher internet diffusion in Africa include Nigeria, where 48% of the population has internet access, Egypt with 29% and then Morocco with 16% internet diffusion. These statistics show how the digital divide prevails in South Africa.

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Based on information from Internet World Statistics (2012), the researcher compiled Table 2.4 below to present the internet usage trends in South Africa over a period of ten years (2000 - 2012).

**Table 2.4: Internet usage and population statistics for South Africa for the period 2000 - 2012 (Internet World Stats, 2012; Statistics South Africa, 2012)**

| Year | Internet users | Population | % Percentage |
|------|---------------|-----------|--------------|
| 2000 | 2 400 000 | 43 690 000 | 5.5% |
| 2001 | 2 750 000 | 44 409 700 | 6.2% |
| 2002 | 3 100 000 | 45 129 400 | 6.8% |
| 2003 | 3 283 000 | 45 919 200 | 7.1% |
| 2004 | 3 523 000 | 47 556 900 | 7.4% |
| 2005 | 3 600 000 | 48 861 805 | 7.4% |
| 2006 | 5 100 000 | 49 660 502 | 10.3% |
| 2008 | 4 590 000 | 43 786 115 | 10.5% |
| 2009 | 5 300 000 | 49 052 489 | 10.8% |
| 2012 | 8 ,500 000 | 48,375,645 | 17.4% |

There has been an increase in the number of people with internet access since 2000. The most notable increase is a jump from 10.3% internet users in 2006 to 17.4% in 2012. The Department of Communications (2011) reports that current research indicates that under conditions characterised by high cost of services, saturation in urban markets and limited access in rural areas, the internet's rate of expansion in South Africa will decline from above 15% to 10% per year by 2015. This projection envisages 11, 3 million internet users by 2015, which is approximately 22% of the population (DoC, 2011; GCIS, 2012). This is still low in comparison to other African countries, as depicted in Figure 2.6.

According to Jensen (2002) and Goldstuck (2002), the use of the internet in South Africa is geographically greatly biased towards the urban areas (and also the provinces of Gauteng and the Western Cape). Rural areas in the country are unfortunately not only lagging behind with regard to internet access, but also with regard to other related issues such as literacy and computer skills (Adebesin & Kotze, 2012; Brown & Czerniewicz, 2010; Conradie, Morris & Jacobs, 2003).

The next subsection offers a discussion of some of the factors contributing to the digital divide in South Africa.

### 2.7.4. Factors influencing the digital divide in South Africa

Factors contributing to the digital divide in general have been discussed earlier in the thesis (section 2.5 of this chapter). The aim of this section, however, is to focus on factors influencing the digital divide with specific reference to South Africa.

The main reason for the digital divide in South Africa is ascribed to the apartheid legacy that promoted separate development, which provided inferior education and poor or no access to learning opportunities for non-white citizens (Naidoo & Raju, 2012; Singh, 2004; Zegeye & Harris, 2002). Adebesin and Kotze (2012), Abdi (2001), Campbell (2001), Crouch (1996), Fong and Cao (2008), Fataar (1998), Martindale (2002), Murelli (2002) and Naidoo and Raju (2012) also argue that socio-economic circumstances, imbalanced educational policies under the apartheid regime, as well as language and content barriers are some of the recognised factors causing the digital divide in South Africa. Educational opportunities are also hard to access in isolated rural areas towards the centre of the country (Singh, 2004; Sikhakhane & Lubbe, 2005). The digital divide is furthermore attributed to high levels of poverty (Fuchs & Horak, 2006; Mutula & Mostert, 2010; Singh, 2004). Many people are living in squatter camps with no telecommunication infrastructure and electricity (Buys & Farber, 2011; Singh, 2004). The next subsection provides a discussion of attempts to bridge the digital divide in South Africa.

### 2.7.5. Attempts to bridge the digital divide in South Africa

As mentioned earlier in Chapter 1 (section 1.1.), steps are being taken to bridge this divide. For example, steps are taken at a macro-level and through government initiatives to develop technology centres or digital villages in townships and rural villages (Adebesin & Kotze, 2012; Czerniewicz, 2004;

Naidoo & Raju, 2012; Osunkunle, 2010; Singh, 2004). South Africa's approach to bridging the digital divide takes an integrated developmental approach with the participation of multi-stakeholders. This section will discuss initiatives to bridge the digital divide, firstly by government, secondly by private enterprises/cooperatives, thirdly by non-governmental organisations and fourthly by individuals.

Tackling the digital divide in South Africa cannot be as simple as employing methods used in other countries to alleviate this problem because of some unique restricting factors, e.g. lack of access to electricity (Herselman & Britton, 2002; Mutula & Mostert, 2010; Osunkunle, 2010). According to Trusler (2003), Harpur and De Villiers (2012), South Africa first has to deal with a number of challenges before it can begin with any initiatives for bridging the digital divide. According to them, these challenges include:

- A high level of inequality;
- Weak ICT infrastructure, particularly in rural areas;
- Lack of ICT readiness in government;
- More pressing demands in the public service that make ICT development a lower priority in budget terms.

In a Green Paper from the Ministry of Communications in South Africa it is stated that one of the aims of educational authorities is to increase digital literacy and that everyone in South Africa should acquire basic digital literacy skills (SADoc, 2000). In response to these disparities, various public and private sector initiatives have been launched that have tried to counteract the South African urban-to-rural digital divide (Adebesin & Kotze, 2012; Conradie, Morris & Jacobs, 2003; Mutula & Mostert, 2010; Osunkunle, 2010). The next subsection will discuss initiatives by the government of South Africa.

*2.7.5.1. Government initiatives*

In 2002, former President Thabo Mbeki observed that a critical and pervasive element in economic development in the current age was optimum utilisation of ICT. A few days later, the then Premier of Gauteng, Mbhazima Shilowa, committed his provincial government to ICTs in pursuit of economic development. Shilowa pointed out that building a smart economy and bridging the digital divide were among the government's core priorities (Petje *at al*., 2002). Moreover, the government had formed a Digital Divide Task Force to assist in bridging the digital divide. Mark Shuttleworth and internet expert Esther Dyson were on President Mbeki's International ICT Task Force, a group formed to contribute common sense, perspective and a broad knowledge of technology and its role in the world to the President's deliberations.

The government also put in place an advisory body, the International Advisory Council, to eradicate the digital divide between the rich and poor. In October 2001, President Thabo Mbeki convened a consultative meeting of leading international IT companies (IMB, CISCO, Hewlett Packard, Alcatel, etc.) and the private sector at Lake Pleasant to deliberate on possible ways of reducing the digital divide (Meyer, 2001 as cited in Mutula, 2002:128).

In 2002 the former premier of Gauteng, Mbazima Shilowa, allocated R500 million from the provincial budget over a three-year period for the Gauteng Online Programme, which was initiated in the 2001/02 financial year (Petje *et al*., 2002). The programme's focus is primarily on education and training of youth in Gauteng Province. The objectives of the programme are to provide ICT laboratories equipped with computers and connect them to the internet (Petje *et al*., 2002). The project will be discussed in more detail later in this section. Besides Gauteng online, the government in 2006 also commenced deploying wireless broadband to 500 Dinaledi schools (considered centres of excellence,) and target clinics, hospitals, libraries, multipurpose community centres and post

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offices to help increase the uptake and usage of ICTs and help ensure inclusivity in building an information society (Mutula & Mostert, 2010).

The following are some of the examples of projects initiated by various government departments in order to address the digital divide in South Africa:

**(a) Department of Communications**

The mandate of the Department of Communications (of special interest to ICT development) is derived from relevant legislation. The legislative framework for the work of the department is contained in the following:

- Broadcasting Act (Act of 1999);
- Electronic Communications and Transactions Act (Act 25 of 2002);
- Electronic Communications Act (Act 36 of 2006);
- Independent Communications Authority of South Africa Act (Act 13 of 2000);
- Sentech Act (Act 63 of 1996);
- The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) (DoC, 2013).

The mandate is to create a favourable ICT environment, ensuring that South Africa has the capacity to advance its socio-economic development goals and support the revival of Africa and the building of a better world. This mandate puts the department at the forefront of government initiatives to bridge the digital divide and provide universal access to ICTs for all South Africans.

The Department of Communications strives:
"*To create a vibrant ICT sector that ensures all South Africans have access to affordable and accessible ICT services in order to advance socio-economic development goals, and support the Africa Agenda and contribute to building a better world*" (DoC, 2011).

Consequently the core functions of the Department of Communications are (the researcher is only highlighting issues of specific relevance to bridging the digital divide here):

- To develop ICT policies and legislation that create conditions for the accelerated and shared growth of the South African economy, which has a positive impact on the well-being of all people in South Africa and is sustainable;
- To ensure the development of robust, reliable and affordable ICT infrastructure that supports and enables the provision of a multiplicity of applications and services to meet the needs of the country and its people;
- To strengthen the ICT regulator and ICASA, in order to enable them to regulate the sector in the public interest and ensure growth and stability in the sector;
- To enhance the capacity of, and exercise oversight over state-owned enterprises in the communications portfolio; and
- To fulfil South Africa's continental and international responsibilities in the ICT field.

Below are some of the main projects undertaken by the National Department of Communications in an attempt to address the digital divide. These include the following initiatives (i) Information Society and Development Programme, (ii) Universal Service and Access Agency of South Africa, (iii) Broadband policy, (iv) Independent Communications Authority of South Africa, (v) Presidential National Commission, (vi) Sentech.

### (i) Information Society and Development Programme

The programme is aimed at increasing South Africa's uptake and usage of ICTs by the government and individuals (DoC, 2006). Accordingly, government has set up a presidential priority project in the form of the PNC on ISAD, bringing together stakeholders to address the challenges of bridging the digital divide (DoC, 2011).

This programme involves the building of a wireless network to connect public centres and businesses in the signal coverage areas. Government has set aside about R500 million for this initiative. The National Digital Repository (NDR) is a subset of this particular initiative, which focuses on culture and heritage in South Africa. The purpose of the NDR is to collect, preserve, promote and disseminate cultural heritage. The approach is to keep this information in digital format, as this will ensure easy access for present and future generations (http://ndr.org.za/about).

With regard to training, the Information Society and Development Programme is also supported by various training initiatives in ICT skills in various fields, including broadcasting, content collation, network and programming, website development and content management. Such training programmes are provided by the National Electronics Media Institute and universities of technology such as the Tshwane University of Technology. These projects assist in training thousands of young people every year (DoC, 2011). The government also supports building integrated centres such as public information terminals, telecentres, MPCCs, community radio and television stations (GCIS, 2012; DoC, 2011).

### (ii) Universal Service and Access Agency of South Africa

The Universal Service and Access Agency of South Africa was established in terms of section 58 of the Telecommunications Act (1996). Its main role is to make recommendations to the Minister of Communications to determine what constitutes universal access for all areas and communities in South Africa. The agency is also mandated to promote universal service and access to communications technologies, as well as services for all South Africans. It furthermore facilitates and offers guidance in evaluating, monitoring and implementing initiatives, which propose to improve universal access and service. The agency is also mandated to manage the Universal Service Fund that is capitalised from financial rest monies appropriated by Parliament. This fund is used to support the infrastructure for the universal services area licensees, as

well as providing infrastructure for telecentres and school cyber resources (computer laboratories with ICT equipment enabling access to the internet and providing multimedia services) (DoC, 2012; GCIS, 2012).

Telecentres are further meant to promote affordable universal access and universal services in ICTs for disadvantaged communities in South Africa to facilitate development, empowerment and economic growth (Akinsola, Herselman & Jacobs, 2005; DoC, 2012; GCIS, 2012; Fuchs & Horak, 2008; Intelecon, 2000; Mutula & Mostert, 2010).

The Universal Service Agency launched an ICT pilot project between 1998 and 2004, with the objective of providing universal access to telecommunications in South Africa. The ICT centres concerned are managed and operated by approved franchisees and are located in disadvantaged communities, particularly rural areas. The objective of the ICT centre project is to provide universal access through public facilities such as telecommunications, facsimile, e-mail and telephone. Some of these telecentres do provide access to the internet to communities. The aim of the agency is to develop a model for the effective running of ICT centres in disadvantaged areas, which would then be reproduced in such a manner that they would not need any more funding from the agency (Akinsola, Herselman & Jacobs, 2005; Lesame, 2010; Mutula & Mostert, 2010; Osunkunle, 2010).

According to Stravrou and Benjamin (2000), most telecentre initiatives in South Africa, for example, the telecentres intervention of the Universal Service Agency, are struggling. It was found that the long-term economic sustainability of these telecentres has been the main problem and stumbling block (Conradie, Morris & Jacobs, 2003; Lesame, 2010).

### (iii) Broadband policy

In 2010, the Department of Communications gazetted the broadband policy. This policy was drafted in terms of Section 3(1) of the Electronic Communications Act, 2005 (Act No.36 of 2005). The objective of the policy is to facilitate the provision of affordable, accessible, universal access to broadband infrastructure to citizens, business and communities, and to promote economic development and growth (DoC, 2012). The focus is placed on building an information society where everyone can create, access, use and share information and knowledge (DoC, 2012).

### (iv) Independent Communications Authority of South Africa

The Independent Communications Authority of South Africa Act (2000) provided for the merger of the South African Telecommunications Regulatory Authority and the Independent Broadcasting Authority to form ICASA. Its mandate is spelt out in the Electronic Communications Act, 2005. ICASA is responsible for regulating the telecommunications and broadcasting industries in the public interest and assure affordable services of a high quality for all South Africans. In addition to developing regulations, ICASA issues licences to telecommunications and broadcasting service providers, enforces compliance with rules and regulations, protects consumers from unfair business practices and poor quality services, hears and decides on disputes and complaints brought against licensees, and controls and manages the effective use of the radio frequency spectrum (GCIS, 2012; ICASA, 2011).

### (v) Presidential National Commission

The PNC provides timely and informed advice to the President of South Africa on all matters related to the development of an inclusive information society. It facilitates the development of an integrated information society in South Africa by promoting the realisation of the country's vision for the building of an information society. In brief, its mandate is to advise on:

- The use of ICTs to optimise the pace and the extent of addressing South Africa's development challenges and enhancing South Africa's global competitiveness;
- South Africa's contribution to and benefit from the development of an inclusive Information Society in Africa and the world;
- The coordinated and integrated development of an inclusive information society in South Africa;
- Support to efforts aimed at making South Africa and Africa integrated and equal members of the global information society (Department of Communications Annual Report, 2009/10; Mutula & Mostert, 2010).

### (vi) Sentech

Sentech is a state-owned, fully commercial enterprise. Sentech was established in terms of the Sentech Act, 1996 (Act 63 of 1996) and the Sentech Amendment Act, 1999 (Act 44 of 1999). It was awarded multimedia and carrier-of-carrier licences in 2002. During the past few years, the company has evolved from the technical and broadcast arm of the SABC into a leader in converging communications technologies. The company aims to provide communication solutions such as voice, data and video on one integrated digital internet-protocol network. Its core business remains broadcasting signal networks (GCIS, 2012).

### (b) Gauteng Online

As mentioned earlier in this chapter, Gauteng Online (www.gautengonline.gov.za) was established in 2001. It is a Gauteng provincial government (www.info.gov.za) initiative to construct a province-wide schools computer network by installing a computer facility in every public school. It is funded by the Premier's office and hosted in the Provincial Department of Education. Gauteng Online (www.gautengonline.gov.za) is intended as collaboration between the government and industry to achieve the following goals:

- Minimum industry standards for networks, hardware and software, for the purpose of roll-out;

- Standard-setting by industry;
- Convergence of ICT and education by following the world's best practices.

The programme's focus is primarily on education and training of youth (www.gautengonline.gov.za). Its objectives as identified by Petje *et al.* (2002:317) are as follows:

- The roll-out of ICT laboratories to approximately 2 500 schools;
- The installation of an average of 25 networked computers per school; internet connectivity with e-mail and website capabilities to some 1.5 million school-goers and 63 000 teachers and administrators;
- Integrated portal networks to foster inter-operability;
- Integration of the existing Gauteng Department of Education systems and processes; mass computer literacy training to 63 000 teachers and administrators and 1.5 million school-goers;
- Online-based curriculum development and computer studies.

In 2012, it was reported that about 1 557 schools had been equipped with standardised computer laboratories that formed part of the phase one implementation of the project. The remaining 630 schools that were part of the second phase of the project were dealt with through the alternative design of the Computer on Wheels solution (www.info.gov.za). A range of educational, edutainment and management applications was offered through portals and educators and learners were provided with an email address and internet access (Petje *et al.*, 2002). The programme also took into account the implications for the job market. Schools, industry and the tertiary education sector were engaged and encouraged to develop a sustainable cycle through which skilled high school graduates migrate from jobs in industry into apprenticeship and learnership programmes, as well as into further education and training (Petje *et al.*, 2002).

A study by Mpehle (2011) revealed that the Gauteng Online project in most schools is offline, and therefore is not as successful as it was planned because of challenges such as infrastructure that does not meet the required standard for the operation of the internet and storage of computers, theft of computers because of inadequate security, lack of stakeholder involvement that contributes to lack of ownership by communities, inadequate monitoring and evaluation systems by the Gauteng Shared Services Centre that will ensure the successful installation and smooth running of computer laboratories, and lack of ample training provided to managers of computer laboratories. It is crucial for the Gauteng Department of Education and communities where laboratories are to maintain greater cooperation and take ownership of the project to ensure its success.

In 2012, it was reported that 700 000 learners and 38 000 educators used the network every day (www.info.gov.za).

**(c) Meraka Institute**

The Meraka Institute is an operating unit of the CSIR focused on ICT. It is in the business of research, innovation and advanced human capital development. With over 200 staff members and students, Meraka is the largest group in South Africa dedicated to ICT research. It has extensive national and international networks and actively collaborates with other organisations across the globe. Meraka contributes to enhancing quality of life and economic competitiveness in South Africa and the continent through ICT (www.csir.co.za/mearaka/). Meraka focuses on:

- Research and developing new technology that enables ICT access, inclusion and use;
- Research, development and transferring innovative ICT products, processes and services into the market;

- Research, development, building and operating a world-class cyber infrastructure;
- Contributing skills and outcomes that are changing the profile of the ICT landscape.

Meraka's research and development cover the following areas:

- Earth observation science and information technology;
- Human language technologies and knowledge technologies;
- Networks and media;
- Integrative systems, platforms and technologies;
- Cyber infrastructure.

During 2009/10, the funding provided to the Meraka Institute was applied in the Meraka Applications and Innovations Programme. The main areas that benefited from the fund were research and development in ICT applications that aim to benefit all citizens, with specific emphasis on e-inclusion into the information society and connectivity pilots and an Advanced Human Capital Development Programme that builds and strengthens human capital development to grow knowledge-generating capacity in ICT in South Africa. This involves the support of doctoral and masters' students and interns (*Department of Communications Annual Report*, 2009/10).

The following are examples of projects undertaken by the Meraka Institute to narrow the digital divide in South Africa:

- **Digital Doorway:** This is an initiative by the South African Department of Science and Technology and the Meraka Institute. This project focuses on providing computers to underprivileged communities around the country. It also provides access to software applications and other resources, most of which are open source applications (Adebesin *et al.,* 2010; Adebesin & Kotze, 2012; Furstenburg, 2005).

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- **Broadband 4 All<sup>TM</sup>:** The outcome of a collaborative effort spearheaded by the Meraka Institute to bridge the digital divide and bring the social and economic benefits offered by broadband connectivity to rural communities in South Africa and other developing countries. The objective of the project is to offer broadband access to rural communities in an affordable and sustainable fashion. This will be made possible by enabling low-cost building and sharing of connectivity through utilising Mesh Networking principles and equipment to expand coverage in local communities, negating the need for expensive radio equipment and high radio towers. To ensure sustainability of the initiative, the local community and more specifically an adequately skilled and trained local entrepreneur, also known as the Village Operator<sup>TM</sup>, are responsible for operating, promoting and expanding the Broadband 4 All<sup>TM</sup> project in their respective communities (www.meraka.org.za).

**(d) Broadband Infraco**

Broadband Infraco is a state-owned enterprise. Broadband Infraco sells high-capacity long-distance transmission services to licensed fixed and mobile network operators, internet service-providers and other value-added network service providers. It has a 13 600-kilometre network of long-distance fibre-optic cable and five open-access points of presence in key metropolitan areas with an additional seven open access points of presence expected over the next few years (GCIS, 2012; Mutula & Mostert, 2010).

*2.7.5.2. Initiatives by private sector and cooperatives*

This subsection will discuss projects aimed at addressing the digital divide initiated or supported by the private sector. Some of the projects entail collaboration between the government and private sector. The following are examples of such projects:

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**(a) Centres of Excellence**

The Centres of Excellence programme is a collaborative undertaking between Telkom, the telecommunications industry and government to promote post-graduate research in ICT and allied social sciences. The programme was launched in 1997. It provides facilities that encourage young scientists and engineers to pursue their interests in South Africa. The programme improves local telecommunications and IT skills, yielding substantial benefits for the academic institutions involved. It has helped Telkom and its local technology partners to solve technical problems and cut costs (GCSI, 2012).

**(b) Digital villages**

Digital villages were established by Private Public Partnerships (PPPs) in townships (semi-urban areas formerly "designated" for black people, located a few kilometres from city centres) (Lesame, 2010; Osunkunle, 2010). An example of a successful digital village is Emdeni, South Western Townships (Soweto). This digital village was established in 1997 (Lesame, 2010).

The objectives of digital villages include making technology accessible to previously disadvantaged communities, building a future resource pool of technologically trained learners for future recruitment, providing personal computer skills, enabling those people trained at the digital villages to market their IT skills through the digital village and the companies funding the village, supporting local businesses such as telecommunications service providers and connecting local communities to the global communication network (Lesame, 2010; Osunkunle, 2012). Microsoft South Africa is one of the funders of some of the digital villages in South Africa (Osunkunle, 2010; Wright, 2003).

**(c) Electronic learning (e-learning) centres**

These centres were established by the private sector, foreign donors and government departments. The purpose of e-learning centres, among others, is to impart ICT skills and provide mathematics and science education to school

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learners (Lesame, 2003a:1). Most of these centres have been established in schools.

## (d) COEGA project

The COEGA project was established in the hope that it might close the digital divide. However, this notion is yet to be proved. It was established in the Eastern Cape in Port Elizabeth. The project was expected to create jobs in an area plagued by unemployment (Green & Theobald, 2002). The African Academy of Computer Assisted Training, an organisation set up and funded by engineering businesses to train disadvantaged students in computer-based engineering and mining-related programmes, established a facility in nearby Port Elizabeth. The academy was funded by the Japanese government to the amount of US$ 25 000. The academy was able to purchase new state-of-the-art computers for its campus in Boksburg. This frees computers for use in Port Elizabeth (Green & Theobald, 2002).

## (e) Amalgamated Banks of South Africa (Absa)

Absa introduced a project through which it made free internet access available to the public early in 2001. However, after one year the service was discontinued because of difficulties in sustaining it. At the time this free service contributed to opening up the internet to thousands of ordinary citizens of South Africa who could not afford the internet service provider rates (Mutula, 2002; Wright, 2003).

## (f) UNINET

This UNINET project provides an internet backbone supporting 500 000 students and staff at 21 traditional universities and 15 universities of technology (formerly technikons), as well as universities in South Africa, Lesotho, Swaziland and Tanzania. It also provides links to 400 schools, which now have connectivity to the internet. Vodacom has also established more than 1 800 phone shops, made up of metal shipping containers with usually five to 10 phone lines that are used for telephone, fax and even internet services. Telkom has rolled out an undersea

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fibre-optic cable that runs from South Africa to Malaysia. The cable can accommodate 4.8 million telephone communications and 8 000 digital television transmissions (Mutula, 2002; Mutula & Mostert, 2010).

## (g) SchoolNet project

The Department of Education supports the SchoolNet South Africa project that is aimed at providing schools with internet access. SchoolNet South Africa has a reputation for providing course materials of substance and training that is tailor-made for teachers and education managers. Through its specialised training, SchoolNet endeavours to enrich teaching practices that transform learning. SchoolNet promotes innovation through educational projects such as Microsoft Partners in Learning Innovative Education Forum and Nokia's Mobile Mathematics for learners that uses the MXit mobile platform (www.schoolnet.org.za).

SchoolNet SA works together with provincial departments of education as partners in planning and implementing basic computer literacy for teachers, as well as more advanced teacher ICT integration programmes. The e-Education White Paper emphasises ICT integration as the preferred mode of ICT use in schools. Through ICT integration, learners are helped to master 21st century learning skills, including thinking, communicating, collaborating, problem-solving, information skills and being self-directed (www.schoolnet.org.za).

In addition, Osunkunle (2010) and Martindale (2002) noted that other organisations and IT industry players have also been involved in the drive to bridge the digital divide. Osunkunle (2010) points out that other IT companies, such as Dimension Data, Vodacom and MTN, have been at the forefront of bridging the digital divide as they donated computers etc. to schools, universities and organisations.

*2.7.5.3. Initiatives by non-governmental organisations*

Various non-governmental organisations also have projects to bridge the digital divide in South Africa. Some of the examples include:

**(a)Translate.org.za**

This is a non-profit organisation that has been set up to translate computer software into various languages used in South Africa (www.translate.org.za). This is the first project of the Zusa Software Foundation, a non-profit organisation aiming to promote development and open source software in Africa. Efforts to make the internet available in as many languages as possible will help close the digital divide for many people.

**(b) The "Citi-Bridge" project**

This is a technological outreach and resource centre jointly developed by Bridges.org with the Cape IT initiatives (CITI). The centre is housed in the Bandwidth Barn, a CITI-sponsored high-tech business incubator, and is situated in a public space with a variety of resources, where people can learn about using technology and understanding the implications of technology to become better informed internet citizens. A library with information resources is available for public use. The online component of the project reflects a "community directory" of organisations and initiatives that are helping to spread information technology, a "volunteer directory" of individuals looking to help bridge the digital divide and a schedule of events in IT-related policy and development (Wright, 2003).

**(c) Bridges.org (www.bridges.org.za)**

This is another initiative in fighting South Africa's digital divide. It is an international non-profit organisation dedicated to bridging the digital divide in developing nations. It has expanded its mission in South Africa by opening an office in Cape Town. It works with local groups to ensure that new technology is used by the people it is supposed to help, especially in areas of education, efficient and open government, and local economic development. Its mission is to

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tackle the obstacles to ICTs use at grassroots level by helping people understand the technology and its utility and also to work at the policy level to promote laws and policies that fosters technology use (Wright, 2003).

**(d) Y Day**

This is another initiative by a group of young people who have decided to try to do something about the digital divide in South Africa. They call themselves Y Day. It is an independent community organisation that aims to help the digital divide by creating an environment where people can become computer literate and learn about the benefits of technology. This group has registered as a non-profit organisation (Scott, 2004). Its strategy is to first create a website to provide the people of South Africa with relevant news and information; to create internet centres with computer literacy training facilities and lastly to distribute newsletters to different areas, especially areas not otherwise reached. Their aim is to have 0.6 million people trained over 10 years (Wright, 2003).

*2.7.5.4. Initiatives by individuals*

This is an example of an initiative taken by an individual to address the digital divide. Professor Peer Wentworth of Rhodes University has developed a project tagged "hole in the wall". In this project computers are literally installed into a hole in a wall near a derelict playground where street kids play. The idea is to develop a computer that can be controlled by the user running a finger over a pane of glass. The project aims at installing computers in secure locations in townships, such as shops, post offices and community centres, where passers-by can access them through the building's windows (Osunkunle, 2010; Wright, 2003).

## 2.8. MILLENNIUM DEVELOPMENT GOALS AND THE WORLD SUMMIT ON INFORMATION SOCIETY

According to Mutula (2008), governments around the world are now preoccupied with how to meet the Millennium Development Goals (MDGs) by 2015. This section presents targets and action plans to meet the MDGs as adopted by the

South African Department of Communications. At the World Summit on Information Society (WSIS) held in Geneva in December 2003, member states adopted specific targets and action plans to meet the MDGs (SA:DoC, 2006). According to the IFLA World Report (2010) lack of internet access definitely has a negative impact on the possibility of Africa meeting the MGDs and on its general economic development. An essential outcome of the WSIS was to articulate the action plans by adopting a comprehensive list of action lines to be implemented by various stakeholders (government, private sector and civil society) to advance the achievement of the information society and the MGDs by 2015 and to promote the use of ICT-based networks, services and applications to help countries overcome the digital divide. These were to be translated into national e-strategies and policies to promote development-oriented ICT applications (SADoC, 2006). The targets and interventions that have been made are reflected in Table 2.5. The table reflects the status quo in 2006 and 2012. Unfortunately, in spite of numerous attempts, it was impossible to determine whether there had been any progress with reaching other targets.

**Table 2.5: Status on WSIS Targets by South African Department of Communication (DoC, 2006; GCIS, 2012)**

| Targets | Status |
|---|---|
| **Target 1:** To connect villages with ICTs | Basic ICT infrastructure has been rolled out in rural communities targeting the 13 Integrated rural development nodes of government. The total number of telephone subscribers (fixed and mobile phones) in 2004 was 23 116 million. In addition, the telephone service provider provides community telephone services as part of its universal service obligations according to its license conditions. |
| Establish community service access | In total 689 public internet terminals were to be rolled out in post offices and MPCCs. These were in Gauteng (73); North-West (83); Limpopo (91); Mpumalanga (71); Eastern Cape (91); Western Cape (76); Free State (74); Northern Cape (53); and KwaZulu-Natal (79). <br> ▪ Sixty-four MPCCs to be rolled out targeting the 285 municipalities across the country. ICT services have been deployed at these centres. These are in Gauteng (17); North-West (4); Limpopo (10); Mpumalanga (5); Eastern Cape (7); Western Cape (7); Free State (4); Northern Cape (4) and KwaZulu-Natal (6). <br> ▪ A hundred and forty telecentres rolled out in under-serviced areas, 52 of which are in the MPCCs. These are in Gauteng (16); North-West (13); Limpopo (28); Mpumalanga (14); Eastern Cape (19); Western Cape (8); Free State (12); Northern Cape (9) and KwaZulu-Natal (20). <br> ▪ Fourteen citizen's post offices rolled out as rural post offices. These are in Gauteng (1); Limpopo (1); Northern Cape (1); Eastern Cape (3); Western Cape (3); Free State (3) and KwaZulu-Natal (2). <br> ▪ Eight communication centres have been deployed in community post offices. These are in Limpopo (5); KwaZulu-Natal (1); Northern Cape (1) and Western Cape (1). <br> ▪ Eighteen digital villages have been rolled out in partnership with the private sector. The digital villages are in Gauteng (9); Eastern Cape (2); Northern Cape (1) and KwaZulu-Natal (2). <br> ▪ Twenty digital doorways have been rolled out by the Department of Science and Technology in partnership with the CSIR. These kiosks are promoting the use of "minimally invasive" education as an iternative means of promoting wide-scale computer literacy.  Two community learning centres, one in Limpopo (Mogalakwena HP I-Community, Mokopane) and one in Mpumalanga (CEIDET Learning Centre, Siyabuswa). |
| **Target 2**: To connect universities with ICTs | ▪ More than 80% of universities and universities of technology (formerly referred to as technikons before the merger of a number of higher education institutions in South Africa) are connected. <br> ▪ Rolled out ICT infrastructure in previously disadvantaged universities and universities of technology. These are in the Eastern Cape (3); Limpopo (1); Free State (1); Western Cape (1); KwaZulu-Natal (2); North-West (1); Gauteng (1). |
| To connect colleges with ICTs | ▪ More than 50% of colleges are connected; 168 internet laboratories (Cyber labs) have been rolled out in disadvantaged areas, including rural colleges. These facilities have 20-27 networked computers with internet and e-mail connectivity. |

| | These are in North-West (22); Limpopo (26); Mpumalanga (29); Eastern Cape (25); Western Cape (5); Free State (17); Northern Cape (19); and KwaZulu-Natal (25). |
|---|---|
| To connect secondary schools with ICTs | ▪ Twenty-four thousand computers have been installed in schools across the country as part of the government's initiative to connect all schools in partnership with SchoolNet.<br>▪ An E-education policy (White Paper of 2004) is in place. |
| To connect primary schools with ICTs | ▪ Six schools are participating in the NEPAD e-Schools Demo Project, which is connecting six schools in each of the 16 participating phase 1 countries. The aim is to equip all African primary and secondary schools with ICT equipment such as computers, televisions and scanners and to connect them to the Internet.<br>▪ E-rate, an initiative to cut ICT costs by 50%. The telecommunications legislation was amended to provide affordable broadband for access to schools.<br>▪ The use of broadband technology is successfully piloted at schools in the Pretoria area as part of Ulwazi School project.<br>▪ Sixty-seven multimedia centres were rolled out by Telkom in rural schools. These centres respectively have between 20 to 27 networked computers with Internet connectivity. |
| **Target 3**: To connect scientific centres with ICTs | ▪ Some work is being done by the Department of Science and Technology to connect scientific centres with ICTs. |
| To connect research centres with ICTs | ▪ Some work is being done by the Department of Science and Technology to connect research centres with ICTs. |
| **Target 4**: To connect public libraries with ICTs | ▪ Some work is being done by the Department of Arts and Culture to connect public libraries with ICTs. |
| To connect cultural centres with ICTs | ▪ Some work is being done by the Department of Arts and Culture to connect cultural centres with ICTs. |
| To connect museums with ICTs | ▪ Some work is being done by the Department of Arts and Culture to connect museums with ICTs. |
| To connect post offices with ICTs | ▪ At present 1314 (51%) post offices are on the network with the capability of providing a range of services such as the Point of Sale system to support counter activities, and serve as enabling infrastructure for the National Lottery and Postbank transactions. Plans are under way to expand the network to the remaining outlets, the majority of which are in the rural areas. |
| **Target 5:** To connect health centres and hospitals with ICTs | ▪ A process of digitising all health centres and hospitals is under way. The idea is to digitise patients' records so as to improve the delivery of health services. The concept is being piloted at Albert Luthuli Hospital in KwaZulu-Natal. |
| **Target 6**: To connect all local and central government departments and establish websites and email addresses | The following initiatives were undertaken to improve delivery of government services:<br>▪ All national departments, provincial departments and metropolitan councils are connected and have their own websites and e-mail addresses.<br>▪ A Government Gateway Portal has been deployed at nine MPCCs, making it possible for citizens to access government |

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| | |
|---|---|
| | information and services.<br>▪ Management information systems for municipalities, targeting the municipalities in the rural development nodes, have been initiated. |
| **Target 7:** To adapt all primary curricula to meet the challenges of the information society, taking into account national circumstances | ▪ The e-Education policy (White Paper) has been developed and this addresses issues of content development and connectivity for education. |
| **Target 8**: To ensure that all the entire world population has access to television | ▪ Three TV channels (SABC) have been licensed for public broadcasting.<br>▪ One commercial TV (e-TV) channel was licensed.<br>▪ Six community TV channels were licensed.<br>▪ One terrestrial subscription TV (MultiChoice, DStv, which started as subscriber management arm of M-Net) was licensed. |
| To ensure that all of the world's population has access to radio | ▪ Nineteen public radio stations were licensed (SABC).<br>▪ Fifteen commercial radio stations were licensed. These are in Gauteng (4); Western Cape (2); KwaZulu-Natal (2); Eastern Cape (1) and four cutting across the remaining provinces.<br>▪ A hundred and sixty-five community radio stations were licensed. These are Gauteng (22); North-West (4); Limpopo (8); Mpumalanga (10); Eastern Cape (11); Western Cape (15); Free State (10); Northern Cape (3) and KwaZulu-Natal (11). |
| **Target 9**: To encourage the development of local content (access services), e.g. internet and broadcasting | ▪ A policy framework to increase the locally developed content as opposed to foreign content is being developed. |
| To put in place technical conditions to facilitate the presence and use of all world languages on the Internet | ▪ Projects reflecting regional and other realities are to be initiated. |
| **Target 10:** To ensure that more than half of the world's inhabitants have access to ICTs within easy reach | ▪ A Tele-density of more than 20% was achieved by the time of the status report; 8.6% of households had access to computers and internet. This figure excludes those that have access to computers and internet at public (community) access points and workplaces. The coverage of broadcasting signal distribution for radio and TV was 90%. |

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## 2.9. CONCLUSION

Chapter two provided a literature review on the concept of the digital divide for this study. The literature review helped in clarifying the concept of the digital divide, as it was only briefly clarified in Chapter 1. Moreover, the theory underpinning this study and different dimensions of the concept of digital divide were also discussed. The literature revealed some statistical information in terms of internet use in South Africa. Although there is some internet use in South Africa, the number of internet users is still low compared to other countries in Africa. There is thus room for improvement. The country needs to improve its standing on internet use in Africa, as it is currently ranked number five.

The chapter also discussed efforts by South Africa to address the digital divide. The discussion shows that there is still a lot that needs to be done, if South Africa is to bridge the digital divide. Some initiatives to bridge this divide were highlighted. The government, however, needs to increase its efforts to provide support and resources, and libraries might also be able to make a contribution. In addition, the concept of the digital divide is aligned to a selection of theories that might in future be used to address it, as well as to study the digital divide. Such theories should be applied to all dimensions of the digital divide, namely the international/global digital divide, grey digital divide, social/domestic divide and democratic divide.

The next chapter therefore reviews the literature on the role of public libraries in bridging the digital divide.

# CHAPTER THREE: LITERATURE REVIEW ON THE ROLE OF PUBLIC LIBRARIES IN BRIDGING THE DIGITAL DIVIDE

## 3.1. INTRODUCTION

In the previous chapter, the definitions and interpretations of the concept 'digital divide' were comprehensively described. Attempts to bridge the digital divide and examples of actual efforts to bridge the digital divide were also discussed in Chapter 2. The chapter also commented on the current status of the digital divide in South Africa, as reported in the literature. In Chapter 3 a literature review on the role of public libraries in bridging the digital divide will be provided.

## 3.2. WHY PUBLIC LIBRARIES?

This section will look at arguments that have been offered (i.e. opinion papers) on why public libraries seem suitable to make a difference to bridge the digital divide.

Public libraries are places and institutions of significant value to their communities. In these institutions educational, economic and social needs are well catered for (Berryman, 2004; Gautam, 2014; Gomez, 2012; O'Brien, 2010). The IFLA indicates that in order to bridge the digital divide, it is necessary to create libraries and information centres offering an environment that allows free and fair access to information and digital resources. According to Rahman (2007) and Gomez (2012), public libraries are seen as a possible solution to challenges concerning access to information. These institutions are also seen as the champion for promotion of an information society (Balina, 2014; Singh, 2007; Rahman, 2007; Vrana, 2010). In Table 3.1 the different aspects that contribute to the suitability of public libraries to address the digital divide are addressed.

**Table 3.1: Aspects that contribute to the suitability of public libraries to address the digital divide**

| Reason | Explanation | Source(s) |
|---|---|---|
| Commitment to freedom of education and lifelong learning. | Focuses on attempts to provide access to information to promote learning to all regardless of age, race or language. | Aabo (2005); Choh (2005); *Falling though the Net* (2005); Gautam (2014); Hull (2003); Jaeger & Fleischmann (2007); Liu & Wnuk (2009); Lough (2008); Moahi (2003); Moe (2004); Mostert (1998); Kreps (2005); Singh (2007); Rahman (2007); Rensel, Abbas & Rao (2006). |
| Trusted by their communities and viewed as community centres. | Trusted as a place to go to obtain all kinds of information from local to international topics. | Bertot & McClure (2000); Berryman (2004); Clark & Gomez (2012); Dutch & Muddiman (2001); Jaeger & Fleischmann (2007); Moahi (2003); Stevenson (2008). |
| Commitment to offer access to ICT. | Public libraries are committed to offer internet access to those who have no other online access and those who need help in order to learn how to use the internet effectively. | American Library Association Office for Intellectual Freedom (2004); Balina (2014); Berryman (2004); Chaudhuri & Flamm (2006); Chisenga (2004); Dutch & Muddiman (2001); Gautum (2014); Ghosh (2005); Jaeger & Fleischmann (2007); Jaeger *et al. (*2012);  Kinney, (2010); Ko (2007); Moe (2004); Rensel, Abbas & Rao (2006); Samaras (2005); Rahman (2007); Xie & Bugg (2009). |
| Public libraries are based in municipalities and local communities. | The physical location of public libraries is important for community identity and cohesion, as well as being gateways to the virtual world. In this way libraries become bridges between the physical community, virtual and global networks. | Audunson & Bakken (2005) as cited in Aabo (2005); Kagan (2000); Xie & Bugg (2009). |
| Committed to provide training. | Many public libraries are committed to provide training in electronic resources and other ICTs. | Jaeger *et al.* (2012); Rahman (2007); Xie & Bugg (2009). |
| Many public libraries have well-trained information professionals, ICT-literate staff and, reasonable infrastructure, including, ICT infrastructure. | Such professionals can create content and provide information services to the different populations. | Jaeger *et al.* (2012); Liu & Wnuk (2009); Moahi (2003); Mutula (2005); Xie & Bugg (2009). |
| Public libraries are viewed as important alternative access points. | Besides access to the internet at homes, work, etc., libraries are | Kinney (2010). |

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| | regarded as public computer access points where people with or without access at home can go to access computers and the internet. | |

The above-mentioned aspects support the opinion that public libraries can be suitable to address various issues concerning the digital divide and to address inequalities in both access to ICT and the ability to use it.

In addition to what has been presented in Table 3.1, Clark and Gomez (2012:25) add that public libraries are venues that are open to the general population and intend to meet the local communities' information needs as a public service. They also pointed out that while all libraries offer books and printed materials, public libraries in developing countries are increasingly also offering access to computers and the internet. In the study conducted by Kinney (2010) on the internet, public libraries and the digital divide in the United States of America, it was revealed that people who belong to groups characterised as *digitally disadvantaged* do tend to use library computers more than those who are more advantaged. The digitally disadvantaged people are more likely to depend on a library as their only source of internet access, although in some cases these differences are minimal (Kinney, 2010).

Lough (2008) argues that public libraries are considered the "ideal vehicle" to provide access and support for computer literacy. Omekwu and Echezona (2009) argue that something exciting about libraries is that most of the services they provide become borderless. Library users can access services in libraries beyond their own country and beyond their continent and the virtuosity of information resources means that millions of users can access one resource in real time (Omekwu & Echezona, 2009). They further emphasise that most of the libraries provide their services online. This implies that their services are no longer constrained by opening and closing hours. Clark and Gomez (2012) argue that the hours of operation of public libraries are critical to sufficiently serving the

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population they are intended to serve. In this context public libraries bear a special responsibility to ensure that the public has access to computers, the internet and other network resources to allow all segments of society to participate in the information revolution (Rahman, 2007).

Public libraries are found in urban as well as rural areas. Though the standard of resources and quality of service may differ in the different locations, many public libraries strive to provide access to electronic resources (Aabo, 2005; Kagan, 2000; Xie & Bugg, 2009).

In some public libraries membership is free or costs little, which makes them accessible and affordable to many people (Clark & Gomez, 2012). Liu and Wnuk (2009:5) indicate that: "Public libraries become critical information access points for populations that lack computers."

In the following section, more detail on the role that public libraries can play in bridging the digital divide is provided.

## 3.3. ROLE PUBLIC LIBRARIES CAN PLAY

The preceding section dealt with aspects of the suitability of public libraries for bridging the digital divide. This section reviews the literature on the role public libraries can play. According to Moe (2004), the importance of analysing the role of libraries in bridging the digital divide is that it will provide policy-makers with information needed for making effective decisions related to ICT in public libraries. Various authors have argued that public libraries can play an important role in bridging the digital divide (Agosto, 2005; Balina, 2014; Bishop *et al.,* 1999; Chisenga, 2004; Clark & Gomez, 2012; Gautam, 2014; Ghosh, 2005; Moahi, 2003; Montiel, 2005; O'Brien, 2010; Ofua & Emiri, 2011; Rahman, 2007; Real, Bertot & Jaeger, 2014; Russel & Huang, 2009; Singh, 2007; Weiss, 2012). Some of the roles are reflected in opinion papers and some are reflected in reports of

actual efforts to make a difference. This section will focus on such opinions expressed in the literature, as well as on reports of efforts.

It has been argued that librarians in public libraries can play a more eminent role in turning the digital divide into digital solutions because librarians have played and are still playing an important role in improving the information literacy of their users (Jianzhong, 2002; Mutula, 2007; Russell & Huang, 2009). Table 3.2 provides opinions expressed by various authors on how public libraries can make a difference.

**Table 3.2: Opinions expressed on the roles of public libraries in bridging the digital divide**

| Roles | Descriptions | Sources (s) |
|---|---|---|
| Providing access. | They can provide people with access to ICTs such as computers and the internet for those who do not have such facilities. | Anaraki & Heidari (2010); Aqili & Moghaddam (2008); Bertot, McClure & Jaeger (2008); Berryman (2004); Chisenga (2004); Foley (2006); Gautam (2014); Ghosh (2005); Gyamfi (2008); Hull (2001); Jaeger & Fleischmann (2007); Kinney, (2010); Kreps (2005); Liu & Wnuk (2009); Moahi (2003); Moe (2004); Nkanu & Okon, (2010); Oliver (2007); Rahman (2007); Russell & Huang (2009); Shuva (2005); *Towards Equality of Access* (2004); Weiss (2012). |
| Developing outreach programmes. | Reaching out and spreading ICTs to those who may not have online access. | McClure *et al.* (2002); Rahman (2007). |
| Information exchange and communication between citizens and government. | Various governments are trying to provide their services to every citizen through the use of electronic technologies, including computers and the internet etc. Libraries can exploit such opportunity by providing computers and internet access to a large number of people. | Berryman (2004); Moahi (2003); Mutula (2007); O'Brien (2010); Plumb (2007); Stevenson (2009). |
| Providing information literacy and ICT literacy programmes. | Training people to be able to access and use information as well as ICTs. | Aqili & Moghaddam (2008); Berryman (2004); Bishop *et al.* (1999); Hart (2006); Choh (2005); Gautam (2014); |

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| | | Gyamfi (2008); Jianzhong (2002); Moahi (2003); Moe (2004); Plumb (2007); Rahman (2007); Russell & Huang (2009); Stevenson (2007); Weiss (2012). |
|---|---|---|
| Information provision. | Providing information to all in order to reduce the gap between those who have the facilities to access digital information and those who do not. | Berryman (2004); Foley (2006); Singh (2007). |
| Libraries can act as equalisers. | Providing their communities with equal free access to internet-equipped computers, software, databases and any assistance in this regard. | Oliver (2007); Rahman (2007); Russell & Huang (2009). |

The aspects addressed in Table 3.3 strengthen the fact that public libraries have a potential role to play in the effort to bridge the digital divide. According to Balina (2014) Liu (1996) and Real, Bertot and Jaeger (2014), especially internet provision could help public libraries to bridge the gap in information access between rural and urban or metropolitan areas. Although emphasis has been put on the provision of access to ICTs, it has also been indicated that such access will not be enough unless people are trained to use ICTs (Aqili & Moghaddam, 2008; Bertort *et al.*, 2008; Chisenga, 2004; Ghosh, 2005; Gyamfi, 2008; Moahi, 2003; Moe, 2004; Plumb, 2007; Rahman, 2007; Russell & Huang, 2009). As mentioned in Chapter 2, there is a need to provide access to electronic resources. This section focuses on such provision of electronic resources by public libraries. In support of this, Liu and Wnuk (2009:5) emphasise that: "… If the library's mission of providing all patrons access to information is to be met and for the digital divide to be avoided, it is imperative that digital resources be made available in public libraries."

As mentioned in the preceding sections, there is a need firstly to provide access for the use of ICTs. Clark and Gomez (2012) maintain that public libraries should continue to offer access to computers and the internet.

Secondly, people must be trained on how to use ICTs. Liu and Wnuk (2009) and Weiss (2012) argue that public libraries cannot provide hardware and access

without providing training on how to use them. If libraries provide such training, they will ensure in that way that people become information literate (Gyamfi, 2008; Moahi, 2003; Moe, 2004; Plumb, 2007; Rahman, 2007; Russell & Huang, 2009).

Thirdly, libraries can teach information technology courses and develop life-long learning and continuing education programmes in cooperation with schools (Gautam, 2014; Rahman, 2007; Russell & Huang, 2009; Stevenson, 2009). According to Russell and Huang (2009), these cooperative programmes will allow libraries and their communities to come together to address the digital divide problem within specific populations by providing them with accessibility and training, focusing directly on their unique requirements. Furthermore, if a larger segment of the society is able to use the information they access on the internet it will enable more people to participate in the knowledge economy (Rahman, 2007).

To succeed in most of these roles, public libraries cannot work alone. Bishop *et al.* (1999), Russell and Huang (2009) and Shuva and Akter (2011) argue that libraries need to work together and partner with local communities, charitable organisations and private sectors to accomplish their goal of helping to bridge the digital divide. Quoted below is a statement by Aqili and Moghaddam (2007:235) supporting this perspective:

> … it is emphasized that regardless of the role of libraries, librarians and the information sector at large, cooperation as well as collaboration among all related bodies, both at the national and international level, is the key to alleviate the obstacles to information access and so diminish the educational and information divide and digital divide within each country …

If ICT infrastructure, access to the internet and appropriate skills as explained in the preceding paragraphs are in place, public libraries can also attempt to bridge the digital divide by implementing digital libraries (Barreto da Rosa & Lamas, 2007; Chowdhury, 2010). According to Chowdhury (2010), Barreto da Rosa and

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Lamas (2007) and Gautam (2014), digital libraries can help bridge the digital divide by providing free access to a variety of digital resources such as electronic theses, e-books, e-journals, digital reference services and e-print archives. Because of the vulnerability of digital materials to loss and destruction due to technological obsolescence, it is significant that these materials be preserved in electronic format (Emekwu & Echezoma, 2009; Mutula, 2007). An added benefit in storing these materials electronically is the ease with which many users could access it.

In Table 3.3 some of the actual examples reported in literature on the roles of public libraries' attempts to bridge the digital divide are presented. The countries were selected randomly and are presented in alphabetical order. A balance of developed and developing countries has been maintained.

**Table 3.3: Examples reported in literature on attempts by public libraries to bridge the digital divide**

| Country | Situation | Effort | Reporting source(s) |
|---|---|---|---|
| Algeria | There is a high level of inequity in Algeria. The more prevalent issues affecting access to public information include the severe inequities regarding employment opportunities, financial aid, subsidised social housing and social security opportunities. These factors limit public access to information. There is little or no investment in wireless technology in much of the country. There is no specific or effective initiative, policy or strategic plan related to public library development. There is no effective collaborative way to link public libraries, cybercafés, private libraries, or non-governmental organisations in attempts to bridge the digital divide. Most information service venues are not conveniently located in communities and seldom even exist in remote and rural areas. | At least 40% of all public libraries offer ICTs. Unlike cybercafés, an average of 60% of all public library users is female. The National Library of Algeria offers computer and internet access. The library has two huge internet centres for the public | Bakelli (2012); Farida and Meftough (2011); Fuchs and Horak (2008); Manyaki (2010). |
| Argentina | Since 2000 the number of Argentina's | Nearly all of the libraries | Rozengardt & Finquelievich |

| | | |
|---|---|---|
| | internet users has increased from 2.4 million to 13 million. Between 2003 and 2006 the average yearly growth exceeded 30%. The results of a study by Rosengardt and Finquelievich (2012) show that at least 34% of the population uses information and ICT tools to some degree. The profile of the typical internet user has changed. Initially, the profile described a relatively elite user having at least a partial university education, a high level of information knowledge and application, a high income, and usually male. The most notable changes in that profile are seen in the great increase in the number of users from the low and medium socio-economic levels. | have computers, but only 60% have internet access, and while nearly all have a large supply of printed materials, they offer limited digital resources. Libraries offer free access to the public, but only a few provide special accommodation for people with impairments or offer content in local languages. Blind and visually impaired library users have access to computers with JAWS software, a Galileo scanner, Braille printers, standard printers, and the internet. | (2012). |
| Bangladesh | Access to information worldwide changed dramatically with the widespread acceptance of the internet and the rapid emergence of new types of public access information venues using ICTs, such as telecentres and cybercafés. These changes in information access have a significant effect on the population of Bangladesh. | Public libraries provide ICTs such as the internet. However, only a few libraries offer ICT-based services. Fees for internet usage are low in most of the public libraries. | Raihan (2012); Shuva and Akter (2011). |
| Botswana | In 2007 it was noted that the country lacked widespread public access to computers and the internet, particularly in rural areas where public access to technology was non-existent. | Public libraries are used as platforms through which citizens could gain access to computers and the internet, because they represent government-supported infrastructure that already operates across the country, involving trained staff with a mission to support access to information. | Barreto da Rosa & Lamas (2007); Sedimo, Bwalya & Du Plessis (2011). |
| Brazil | The primary public access venue landscape in Brazil is composed of libraries, telecentres and cybercafés. There are roughly 5 000 libraries, 13 000 telecentres and 58 000 cybercafés, and each has its own political, social and | All public libraries offer free access to community members and offer unrestricted access to the collections, facilities and equipment.  Libraries in the | Voelcker & Novais (2012). |

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| | | | |
|---|---|---|---|
| | economic context. The national ICT regulatory framework supports the expansion of ICT access for the underserved population. | state of Bahia have succeeded in using this approach to acquire computers with investments from the Digital Programme. This programme donates computers to create telecentres and covers the costs related to internet access and operator salaries. | |
| Canada | According to the 2009 Canadian Internet Use Survey (conducted bi-annually by Statistics Canada), 80% of Canadians are using the internet for personal reasons, up from 73% in 2007 and 68% in 2005. However, those living in communities of fewer than 10 000 people had a much lower rate of internet use at 73% (many of the smaller communities in Canada are also the areas where high speed internet access is unavailable - 16% of rural households lack broadband access). In all of these categories, the digital divide is slowly narrowing; however, the situation is becoming increasingly problematic, as full participation in the public sphere relies more and more on internet access. This set of circumstances prompted policy decisions by both federal and provincial governments on the role of libraries in the emerging electronic information environment, which culminated in early initiatives that focused on infrastructure development and public access in libraries across Canada. | Saskatchewan's public libraries took an important step forward in diminishing the digital divide by developing a hands-on training programme designed especially for those without internet access or ICT skills. | Bredin (2001); Howard *et al.* (2010); Oliver (2007); Statistics Canada (2010). |
| Cape Verde | Cape Verde's entry into cyberspace was relatively late; it was the 29th African country to be connected to the internet. Very slow growth in internet usage and lack of libraries capable of providing proper response to local demands in Cape Verde were noted. | The construction of a digital library project by the University of Jean Piaget was initiated. This was due to the availability of computers and internet access at the university. The Department of Social Communication is working | Agyeman (2007); Barreto da Rosa & Lamas (2007); ITU (2002). |

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| | | with libraries to provide ICT access. | |
|---|---|---|---|
| Chile | It was reported that there was a significant challenge of lack of ICT infrastructure in Chile, resulting in many people not having access to computers and the internet | Through the BiblioReds project (funded by the Bill and Melinda Gates Foundation) public libraries provided access to public computers and internet training services. Public libraries offered free access to information and internet access. | Barreto da Rosa & Lamas (2007); Ferdandez & Goldenberg (2004); Sanchez (2010). |
| Columbia | Connectivity data in Colombia reveal growing government concern about passing public policies that will promote social ICT use and appropriation. The internet's dramatic breakthrough and growth, as well as a 76% increase in the telecommunications industry's income between 2006 and 2009, stimulated this concern. | Colombian libraries offer moderate optimism in connection with ICT access: in January 2010, the 1379 Act that provided a regulatory framework for public libraries was enacted and set libraries the challenge of playing a strategic role in education, science, technology, research and the economic and cultural development of the country. Among others, the Act requires that by 2015 all libraries have an internet connection and provide people with a physical disability, like the blind, with programmes and with new technology to enable them to use the internet. Digital literacy training is offered by libraries. | Baron & Valdes (2012). |

| Egypt | Despite strong support from the government for public access to technology-based ICTs venues, the public most commonly accesses information through mass media and other means, especially through television and by word of mouth. This is particularly evident among lower-income and underserved people, rural people and those in smaller communities far removed from urban centres. The educational level and gender of potential users are commonly regarded as the most important factors affecting access to public information venues. The gender constraint is a reflection of cultural issues that restrict females from accessing certain types of venues, such as cybercafés, especially during late hours. | Public libraries remain a destination that most people use as a valuable public source of information. Among the more notable libraries are the 18 public libraries in the greater Cairo area that provide access to computers and the internet. Libraries also added a more colourful spectrum of activities that involved arts, theatre and digital ICTs. | Hashem (2002); Wanas (2012); Warschauer (2003). |
|---|---|---|---|
| Lithuania | In Lithuania the internet was used by a small number of the inhabitants over 15 years of age. Lack of access was a problem. Only 5, 8% of inhabitants had internet access from home. | Libraries provided public access to computers and the internet. They also provided training in computer literacy. | Barreto da Rosa & Lamas (2007); Žilinskas (2012). |
| Malaysia | Malaysia is a good example of a developing country that understands that ICTs are an important factor in national development. In the last few (before 2012) Malaysian development plans, the country placed significant emphasis on investing in ICTs and benefiting from them as a major contribution in economic development. The public and private sectors in Malaysia have both voiced strong commitment to deploying ICTs nationwide. Collectively, they consider ICTs one of the most important factors for enabling Malaysia. | Public libraries have internet centres founded by the Malaysian Communication and Multimedia Commission. | Kushchu (2012). |

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| Namibia | Overall, access to ICTs is quite limited throughout the country. There is a widespread, strong demand in Namibia for ICTs, driven to some degree by the huge distances between the communities and the geographic isolation of large parts of the population. A huge digital divide separates people who live in urban areas and those living in non-urban environments. | The National Library in Windhoek has computers for local and internet access. Other community libraries based in the less well-developed areas also provide access to computers and the internet access through ten computers. The few libraries that offer internet access do so free of charge, and library membership fees also are quite low. | Brown (2012); James & Louw (2012); Katriina (2005). |
|---|---|---|---|
| Poland | About 40% of public libraries did not have access to the internet. Telekomunikacja Polska SA (TP SA) and the national government connected all public libraries to the internet free of charge. The Polish society is divided in terms of digital inclusion/exclusion. | Public libraries provide access to the internet, multimedia services and electronic services such as digital reference services. | Barreto da Rosa & Lamas (2007); Lechman (2008); Macho-Zajda (2005), Ponder & Markova (2005). |
| United States | Bridging the digital divide is a feature that the United States government has been attempting to address since the Telecommunications Act of 1996. An increasing number of residents in America are engaged on the internet daily. Black people in the United States of America face a higher rate of unemployment than whites. This is because black people are more unlikely to have access to or search for online jobs. An estimated 37% of Americans without access to the internet at home are dependent on access at libraries. | The Bill and Melinda Gates Foundation has been in the forefront of supporting public library projects by providing funding. Many public libraries in the United States offer free access to computers and the internet. | Bertort *et al.* (2012); Jaeger *et al.* (2012); Short (2012); *Towards equal access* (2004). |

In the next section of this chapter, challenges faced by the public libraries in their attempt to bridge the digital divide are explored.

## 3.4. CHALLENGES FACED BY PUBLIC LIBRARIES

In attempts to bridge the digital divide, public libraries face a number of challenges. This section therefore provides opinions on such challenges reported

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in the literature referring to efforts by public libraries to bridge the digital divide. Public libraries are faced with complex issues (Bishop *et al.,* 1999; Gautam, 2014; Ofua & Emiri, 2011), which limit their ability to provide support or to do outreach work to assist those who are affected by the digital divide (Dutch & Muddiman, 2001). Challenges faced by specifically public libraries are described below. It must be noted though that these challenges greatly overlap with the general challenges or barriers faced in bridging the digital divide, as discussed in Chapter 2 (section 2.4).

- **Lack of funds or budget cuts:** This can jeopardise the role of public libraries in providing access to computers. Libraries are finding it difficult to get funding for replacements of workstations, upgrades and bandwidth enhancements. This is a problem because internet content requires increasingly faster processors, graphics capabilities, peripherals (e.g. scanners, Web cams, microphones) and larger amounts of bandwidth (Bertot, McClure & Jaeger, 2008; Chisenga, 2004; Chowdhury, 2002; Foley, 2006; Gautam, 2014; Gosh, 2005; Jaeger *et al.,* 2006; Jaeger *et al.*, 2012; Kinney, 2010;  Moe, 2004; Nkanu & Okon, 2010; Plumb, 2007; Real, Bertot & Jaeger, 2014; Singh, 2008; Shuva, 2005; *Towards Equality of Access*, 2004;  Weiss, 2012).
- **Lack of physical space:** Some library buildings are out of space and cannot support more workstations and some are insufficiently wired for the power requirements of workstations and patron-provided laptops (Bertot, McClure & Jaeger, 2008; Jaeger *et al.*, 2008; Nkanu & Okon, 2010; Shuva, 2005). This can prevent further expansion of internet services in many libraries.
- **Staff shortage:** Lack of dedicated ICT staff is a particular burden for many public libraries. This implies that there will be a shortage of staff to help with ICT and information literacy training (Bertot, Mc Clure & Jaeger, 2008; Chisenga, 2004; Chowdhury, 2002; Dutch & Muddiman, 2001; Gosh,

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2005; Jaeger *et al.,* 2006; Kinney, 2010; Mantora, 2001; Oliver, 2007; Singh, 2008; Shuva, 2005).

- **Lack of training:** Absence of training programmes to improve library staff and users' ICT skills hampers efforts to train people (Gautam, 2014; Kinney, 2010; Liu, 1996; Nkanu & Okon, 2010; Real, Bertot & Jaeger, 2014).

- **Lack of government support or inadequate government support for libraries:** In some countries government policies do not support libraries by providing resources, which implies that many librarians are disadvantaged, working in a badly constructed environment with poor resources (Jaeger *et al.*, 2008; Mantora, 2001; Shuva, 2005).

- **Privacy:** The trusted role of protecting users' personal information may create conflicts with other social responsibilities of public libraries. Because of the lack of preparedness of some librarians to deal with privacy issues, it is possible that people might shy away from using the library (Jaeger & Fleischmann, 2007; Plumb, 2007).

- **Lack of ICT strategies:** There is a need to assist public library services with the development of formal ICT strategies. In their absence most of the libraries will continue using ICTs in an ad hoc manner, which in the long run will not be cost-effective (Chisenga, 2004; Zulu, 2004).

- **Maintenance and support:** The addition, replacement and upgrading of public access technologies bring about a range of support and maintenance issues (Bertort, McClure & Jaeger, 2008; Hardy & Johanson, 2003; Nkanu & Okon, 2010; Jaeger *et al.*, 2006; Shuva, 2005).

Some of the challenges may prove to be obstacles for public libraries in attempts to play a major role in bridging the digital divide. It is imperative that the above-mentioned issues first be identified in order to address them. Failure to address these and similar challenges will definitely hamper the role of public libraries in bridging the digital divide.

## 3.5. CONCLUSION

In this chapter a summary of the suitability of public libraries to bridge the digital divide was outlined. Secondly, the possible role public libraries can play in bridging the digital divide was extensively discussed. Thirdly, some of the examples of actual efforts by public libraries to bridge the digital divide, as reported in the literature, were described. Finally, this chapter ended by identifying challenges faced by public libraries in their attempt to bridge the digital divide. The next chapter will outline the research methodology to be followed to complete the empirical component of the study.

# CHAPTER FOUR: RESEARCH DESIGN AND METHODOLOGY

## 4.1. INTRODUCTION

The previous two chapters formed the literature review for this study. Chapter 2 provided insights into the definitions and interpretations of the concept of digital divide. A literature review on the role of public libraries in bridging the digital divide was covered in Chapter 3. The literature review provided the theoretical framework to guide this study. This was important for the choice of research instruments for the empirical component of this study. Though Chapter 1 (section 1.6) briefly touched on the research methodology, this chapter will deal with it in more detail. This chapter outlines the procedure followed in data collection and analysis. The chapter, therefore, presents the description of the research methodology, research purpose, research question and sub-questions, research approach, population, data collection techniques, limitation of the study and approach to data analysis.

## 4.2. RESEARCH PARADIGM/PHILOSOPHY

According to Babbie (2007), a paradigm is a model or framework for observation and understanding, which shapes both what we see and how we understand it. Pickard (2013: 6) used Kuhn's definition of paradigm as the entire constellation of beliefs, values, techniques and so on shared by members of a given (scientific) community. Creswell (1998) asserted that researchers approach their studies from a certain "paradigm", a basic set of beliefs or assumptions that guide their inquiries. Pickard (2013: 7) lists the following paradigms: positivism, post-positivism, interpretivism and pragmatism. The assumptions of a paradigm relate to the nature of reality (the ontology issue) (Creswell, 1998; Pickard, 2013: 8-9), the relationship of the researcher to that which is being researched (the epistemological issue) (Creswell, 1998; Pickard, 2013: 9), and the assumption of how one conceptualises the entire research process (methodological issue).

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Therefore, to clarify the researcher's structure of inquiry and methodological choices, an exploration of the paradigm adopted for this study will be briefly discussed prior to any discussion about the specific methodologies used in this study. According to Pickard (2013), the paradigms most commonly used in the field of information, communication and related disciplines are positivism, post-positivism and interpretivism.

The positive paradigm argues that there is one objective reality (Pickard, 2013). Studies using this paradigm collect quantitative data (Weaver & Olson, 2006). It is associated with rigid rules of logic and measurement, truth, absolute principles and prediction (Cole, 2006; Halcomb & Andrew, 2005; Hope & Waterman, 2003; Weaver & Olson, 2006). The interpretative paradigm supports the view that there are many truths and multiple realities and focuses on a holistic perspective of the person and environment (Weaver & Olson, 2006). Studies using this paradigm collect qualitative data (Michel, 2008) to give participants the opportunity to voice their opinions, experience, concerns and practices (Cole, 2006; Weaver & Olson, 2006).

This study is based on a post-positivist paradigm using a triangulation approach (i.e. using mixed methods in data collection and analysis) to investigate the role of public libraries to bridge the digital divide. According to Pickard (2013: 11), mixed methods fall within the post-positivist paradigm.

## 4.3. RESEARCH PROBLEMS AND RESEARCH QUESTIONS

As mentioned in Chapter 1 (section 1.5), the central research problem for this study focuses on the question of what role public libraries can play in bridging the digital divide and how they can do this.

The central research question is divided into the following sub-questions:

- What is the scope and implications of the digital divide? (These include the meaning of the concept, the dimensions, the factors leading to the digital divide, as well as its implications).

- What has been reported on the role of libraries (including information services) in bridging the digital divide?

- What have libraries in South Africa done to address the digital divide, and which possibilities are foreseen?

- How can South African libraries be positioned to contribute to bridging the digital divide?

The research sub-question regarding the scope and implications of the digital divide and the sub-question on what has been reported on the role of libraries in bridging the digital divide were addressed by means of a literature review (non-empirical research). The sub-question regarding what libraries in South Africa have done to address the digital divide is addressed by the empirical component of this study.

The next section presents the research approach adopted for this study.

## 4.4. RESEARCH APPROACH

Most research is based on a certain type of study. There are two types of studies, namely empirical and non-empirical (see Figure 4.1) (Mouton, 2001). Empirical studies entail using primary data gathered through surveys, experiments, case studies etc., while non-empirical studies entail using existing data such as those found in literature reviews, philosophical analysis, conceptual analysis, etc. (Mouton, 2001). There are two fundamental research approaches, namely qualitative and quantitative (Creswell, 2009; De Vos, 1998; Leedy & Ormrod, 2005). The process of combining more than one research method (e.g. qualitative methods and quantitative methods) is referred to as triangulation (De Vos, 1998; Gray, 2009; Maree & Van der Westhuizen, 2010). Blanche (2004), as

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cited in Maree and Van der Westhuizen (2010), explains that triangulation is critical in facilitating interpretive data and establishing the trustworthiness of data and could require researchers to check the extent to which the conclusions based on qualitative sources are supported by a quantitative perspective, and vice versa. A mixed methods approach is useful to capture the best of both qualitative and quantitative approaches and reduces the risk of chance associations and systematic bias. It relies on information collected from a diverse range of individuals, teams and settings, using a variety of methods (Creswell, 2009). Types of studies are depicted in Figure 4.1.

**Figure 4.1: Types of studies (Mouton, 2001:57)**
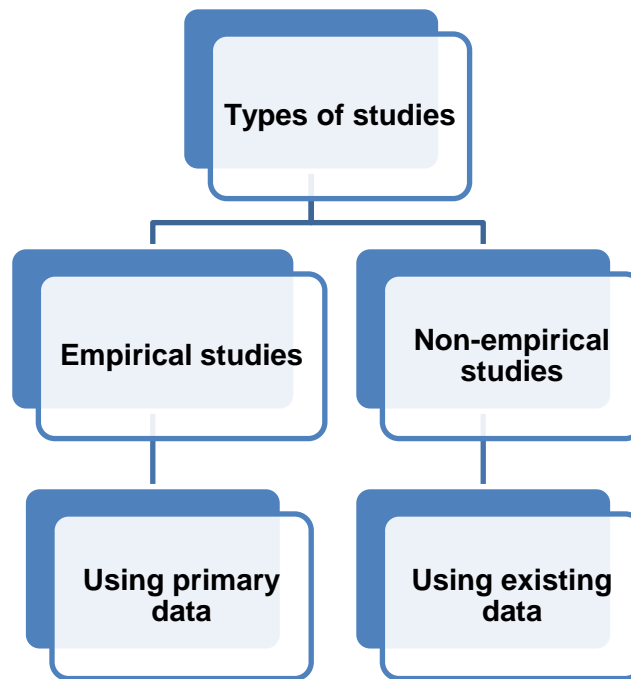


As indicated earlier in this section, both qualitative and quantitative approaches will be discussed in more detail in the next subsections. Both qualitative and quantitative approaches were used in this study and each has strengths and weaknesses.

### 4.4.1. Qualitative methodology

According to Mouton (2001), as well as Payne and Payne (2004), a qualitative approach focuses on subjective experiences and opinions of individuals. It is

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sensitive to and interested in the contexts in which people interact with one another. According to Leedy and Ormrod (2005:133) and Creswell (2003:181), qualitative research focuses on phenomena that occur in natural settings, in the "real world". Qualitative research is highly contextual, being collected in a natural "real life" setting, often over a long period of time (Gray, 2009). Gray (2009) argues that qualitative research can also be used to identify the kinds of concepts or variables that might later be tested quantitatively (as in using a mixed methods research approach).

Leedy and Ormrod (2010:136) indicate that qualitative research serves one of the following purposes:

- Description: It reveals the nature of certain situations, settings, processes, relationships, systems, or people.
- Interpretation: It supports gaining new insights about a particular phenomenon, developing new concepts or theoretical perspectives about the phenomenon, and/or discovering problems that exist within the phenomenon.
- Verification: It allows a researcher to test the validity of certain assumptions, claims, theories, or generalisations in real-world contexts.
- Evaluation: It provides a means through which a researcher can judge the effectiveness of particular policies, practices, or innovations.

Creswell (2003) adds that qualitative research uses multiple methods that are interactive and humanistic. Methods of data collection are growing, and they increasingly involve active participation by participants and sensitivity to the participants in the study.

Blaikie (2010:215) identifies the preoccupations of qualitative research. Qualitative researchers are more concerned with:

- Using the social actors' point of view;
- Describing thickly;

- Focusing on social processes;
- Adopting a flexible approach;
- Developing concepts and theory.

Qualitative methods concentrate on the quality of human behaviour, i.e. on the qualitative aspects as against the quantitatively measurable aspects of human behaviour (De Vos, 1998; Mouton, 2001).

### 4.4.2. Quantitative methodology

Quantitative research is described as research that is concerned with numbers, measurements and frequencies. Leedy and Ormrod (2005) describe quantitative methods as the approach that yields quantitative information that can be summarised through statistical analysis. Quantitative methods seek regularities in human lives, by separating the social world into empirical components called variables, which can be represented numerically as frequencies or rates (Payne & Payne, 2004). According to Babbie (2007), quantitative methods make it easier to aggregate, compare and summarise data. Moreover, they open up the possibility of statistical analyses, ranging from simple averages to complex formulas.

Quantitative methods offer the advantages that numbers have over words as measures of some quality (Babbie, 2007). Table 4.1 presents some differences between qualitative and quantitative methods.

**Table 4.1: Some differences between quantitative and qualitative methods (adapted from Gray, 2009:190)**

|  | Quantitative methods | Qualitative methods |
| --- | --- | --- |
| Epistemological positions | Objectivist | Constructivist |
| Relationship between researcher and subject | Distant/outsider | Close/insider |
| Research focus | Facts | Meanings |

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| | | |
|---|---|---|
| Relationship between theory/concepts and research | Deduction/confirmation | Induction/emergent |
| Scope of findings | Nomothetic | Ideographic |
| The nature of data | Data based upon numbers | Data based upon text |

After a careful investigation of the research approaches and some of their differences as depicted in Table 4.1, the research approaches and methods that would be appropriate for this study were decided on. For this study an empirical survey was selected to collect qualitative and quantitative data by means of questionnaires and interviews. The reason for quantitative and qualitative research is to gain from the advantages of using both approaches. Glazier and Powell (2004:9) argue that the flexibility afforded by having multiple approaches from which researchers may draw conclusions gives researchers a better opportunity to understand the complex social phenomena the world is facing today.

Ivankova *et al.* (2010:263) argue that collecting both qualitative and quantitative data can be helpful in gaining an in-depth understanding of some trends and patterns, generating and testing the theories, developing new measurement instruments, studying diverse perspectives or understanding the relationships between variables. For every research method to be used to collect such data, the related collection instrument with its concomitant objectives, advantages and disadvantages are explained in this chapter. The next section presents a discussion on research surveys and their advantages.

## 4.5. SURVEY RESEARCH

A survey entails acquiring information about one or more groups of people, perhaps about their characteristics, opinions, attitudes, or previous experience, by asking them questions and tabulating their answers (Maree & Pietersen, 2010; Leedy & Ormrod, 2010:187).

Maree and Pietersen (2010:155) mention two typical characteristics of surveys, namely:

- Samples are usually big, from a few hundred to a few thousand;
- Many variables are measured and multiple hypotheses can be tested.

Surveys are excellent to measure attitudes and orientations in a large population (Babbie, 2007). A survey can typically use face-to-face interviews, telephone interviews and questionnaires. It uses instruments specifically designed to elicit information that will be useful for analysis (Babbie, 2007; Leedy & Ormrod, 2010).

### 4.5.1. Advantages of surveys

It is essential to understand the benefits or advantages of surveys (Babbie, 2007; Leedy & Ormrod, 2010). The advantages include the following:

- Surveys use standardisation of the data collected (Babbie, 2007).
- A large amount of data can be collected and there is a chance to sample a large population (Babbie, 2007).
- A survey is less demanding in its design requirements and is easier for the researcher to conduct than any other types of research (Leedy & Ormrod, 2010).

### 4.5.2. Disadvantages of surveys

According to Babbie (2007), surveys are somewhat artificial, potentially superficial, and relatively inflexible. He argues that surveys are comparatively weak on validity and strong on reliability.

In order to collect data required for this study a survey was used. Surveys have also been reported for other studies on the digital divide and the role of public libraries, as reflected in Table 4.2 in Section 4.5.

## 4.6. RESEARCH METHODS USED IN RELATED STUDIES

Some related studies on the digital divide and the role of public libraries in addressing the digital divide report the use of both qualitative and quantitative research approaches. This can be seen in the studies by Bertort *et al.* (2010), Chisenga (2004), Jay and Webber (2004), Liu and Wnuk (2009), Oliver (2007) and Semertzaki (2008).

This section will provide examples of some related studies on the role of public libraries in addressing the digital divide and different methods used, as reported in the literature. Most of these studies deal with the use of ICTs such as the internet in public libraries. Most of these studies also combine qualitative and quantitative methods. They use questionnaires and interviews as data collection techniques. A selection of such studies is depicted in Table 4.2. They are presented from the oldest to the newer according to date of publication.

**Table 4.2: Research methods used in related studies**

| Focus of the study | Sampling | Data collection method | Type of study | Author |
|---|---|---|---|---|
| Focus is on community information exchange and computer access in public libraries in the United States of America, in Illinois. | 150 adult participants and 48 teen participants | Focus group interview and individual interview | Qualitative and quantitative | Bishop et al. (1999) |
| Survey of public libraries to obtain information about how libraries are managing various aspects of public internet access. | 1 297 public libraries | Questionnaires | Quantitative | Library Research Centre, University of Illinois (2000) |
| The study focused on the status and use of ICTs in African public libraries. | 22 libraries (not individual participants) in 10 African countries | Questionnaires | Qualitative and quantitative | Chisenga (2004) |
| The study investigated the impact of the internet on reference services in public libraries in England. | 50 libraries | Literature survey and questionnaires | Qualitative and quantitative | Jay & Webber (2005) |

| | | | | |
|---|---|---|---|---|
| This study explores ICT literacy development in a group of individuals who participated in the Internet Pilot's License training programme offered by two regional libraries in Saskatchewan. | 305 adult participants | Questionnaires and observations | Quantitative and qualitative | Oliver (2007) |
| The study investigated the utilisation, integration and exploitation of the internet among library users in Greece. | 87 librarians | Literature survey and questionnaires | Qualitative and quantitative | Semertzaki (2008) |
| The study was about public libraries regarding their internet connectivity, computing resources and technology funding. | 6 111 libraries (not individual participants) | Questionnaires | Quantitative | Bertot *et al.* (2009) |
| Investigation on internet access in public libraries in Australia. | 200 public libraries were requested to participate in the study. | Questionnaires | Qualitative and quantitative. | Australian Library and Information Association (2009). |
| Focus on the impact of digital resources in public libraries in Connecticut State (United States of America). | 146 library users from six public libraries across New England participated. | Questionnaires | Qualitative and quantitative | Liu & Wnuk (2009) |
| The study is about the importance of public library internet access in the United States of America. | 6 979 public libraries users | Questionnaires and interviews | Qualitative and quantitative | Bertot et al. (2010) |
| The study investigated the reasons why the internet matters to the library. It uses 2 000 data sets of the United States of America census to evaluate the efforts by libraries in bridging the digital divide. | Not indicated | Content analysis | Quantitative | Kinney (2010) |
| The main purpose of this study is to show how public, | Not indicated | Interviews | Qualitative and quantitative | Shuva & Akter (2011) |

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| school and college libraries can reduce digital divide at the national level in Bangladesh. | | | | |
|---|---|---|---|---|

## 4.7. RESEARCH POPULATION

This section discusses research populations and sampling techniques before describing the population that participated in this study. Population means a group of individuals or items that share one or more characteristics from which data can be gathered (Strydom & De Vos, 1998:190). According to Babbie (2007:190) and Blaikie (2010), a population is that aggregation of elements from which the sample is actually selected. Powers, Meenaghan and Toomey (1985:235, as cited in De Vos, 1998:190) also define a population as a set of entities for which all the measurements of interest to the researcher are represented. Singh (2007) adds that a population symbolises the total number of human inhabitants of a specified area.

Leedy and Ormrod (2010) allude to the fact that in most situations, the researcher will not study the entire population of interest. Instead, he or she will select a subset or sample of that population. Blaikie (2010) argues that it is necessary to clarify the concepts of population and sample in order to apply a sampling technique. The following are methods that can be used to draw a sample from a population:

### 4.7.1. Probability sampling

Probability sampling is defined as a method of sampling that utilises some form of random selection of cases for research (Maree & Pietersen, 2010; Plowright, 2011:38; Singh, 2007:102). In probability sampling, the researcher can specify in advance that each segment of the population will be represented in the sample (Leedy & Ormrod, 2010; Strydom & De Vos, 1998).

The four main probability sampling techniques are:

### (a) Simple random sampling

Simple random sampling entails choosing a number of cases at random from a larger group of cases (Plowright, 2011). Random selection requires that each case has an equal and independent chance of being selected (Babbie, 2007; Creswell, 2009; Leedy & Ormrod, 2010; Maree & Pietersen, 2010; Plowright, 2011; Singh, 2007; Strydom & De Vos, 1998). According to Babbie (2007), simple random sampling offers access to a body of probability theory, which provides the basis for estimating the characteristics of the population, as well as estimating the accuracy of samples. Simple random sampling is easy when the population is small and all its numbers are known (Leedy & Ormrod, 2010).

### (b) Systematic random sampling

Systematic random sampling involves selecting, say, every eight or tenth name on the list; the sequence must originate by chance (Leedy & Ormrod, 2010; Maree & Pietersen, 2010; Plowright, 2011; Strydom & De Vos, 1998). Randomisation would be built into the process by making the first name selected a random choice. Singh (2007) argues that in systematic random sampling, the unit is selected on a random basis and then additional sampling units are selected at an evenly spaced interval until all desired units have been selected.

### (c) Stratified random sampling

Stratified sampling involves dividing the population into different groups, that is, into different strata and then randomly selecting a sample of cases from each group (Maree & Pietersen, 2010; Plowright, 2011; Singh, 2007; Strydom & De Vos, 1998). According to Babbie (2007), stratified sampling is a method for obtaining a greater degree of representativeness by decreasing the probable error. In stratified random sampling, the researcher samples equally from each one of the layers in the overall population (Leedy & Ormrod, 2010). This method has the advantage of

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guaranteeing equal representation of each of the identified strata (Leedy & Ormrod, 2010; Strydom & De Vos, 1998).

## (d) Cluster sampling

Cluster sampling signifies that instead of selecting individual units from a population, entire groups or clusters are selected at random (Singh, 2007). Randomisation can then include selecting, at random, a set number of clusters from the total number available and then randomly selecting sample cases from each cluster (Maree & Pietersen, 2010; Plowright, 2011). Cluster sampling is described as a method in which natural groups are sampled initially, with the members of each selected group being sampled afterward (Babbie, 2007). Leedy and Ormrod (2010) and Strydom and De Vos (1998) assert that sometimes the population of interest may be spread out over a large area. It may not be feasible to make up a list of every person living in the area. Instead, the researcher might obtain a map of the area, showing political boundaries or other subdivisions, and then subdivide an expansive area into smaller units.

## 4.7.2. Non-probability sampling

Non-probability sampling implies that the choice of cases is not based on randomised selection, but on criteria that provide a sample that meets a particular need, depending on the aims of the research (Maree & Pietersen, 2010; Plowright, 2011; Singh, 2007). In non-probability sampling, the researcher has no way of forecasting or guaranteeing that each element of the population will be represented in the sample. Furthermore, some members of the population have little or no chance of being sampled (Leedy & Ormrod, 2010).

The four main non-probability sampling techniques are:

## (a) Purposive sampling

In purposive sampling, people or other units are chosen for a particular purpose (Leedy & Ormrod, 2010; Maree & Pietersen, 2010; Nieuwenhuis,

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2010; Singh, 2007; Strydom & De Vos, 1998). Leedy and Ormrod (2010) caution that although purposive sampling may be very appropriate for certain research problems, the researcher should always provide a rationale, explaining why he or she selected the particular sample of participants.

**(b) Convenience sampling**

In the case of convenience sampling, units are selected for the sake of convenience (Singh, 2007). Convenience sampling allows access to participants who are conveniently available (Maree & Pietersen, 2010; Plowright, 2011). This method makes no pretence of identifying a representative subset of a population. It takes people or other units that are readily available, for instance those that arrive on the scene by mere happenstance (Leedy & Ormrod, 2010).

**(c) Quota sampling**

This method is a variation of convenience sampling. It selects respondents in the same proportions that they are found in the general population, but not in a random fashion (Leedy & Ormrod, 2010; Singh, 2007; Strydom & De Vos, 1998). This type of sampling regulates only the size of each category within the sample. In every other respect, the selection of the sample is non-random and in most cases it is convenient (Leedy & Ormrod, 2010; Maree & Pietersen, 2010).

**(d) Viral sampling**

Viral sampling is traditionally referred to as snowball sampling (Plowright, 2011). This method entails approaching a single case involved in the phenomenon to be investigated, to gain information on other similar persons. In turn, this person is again requested to identify further people who may make up the sample (Nieuwenhuis, 2010; Singh, 2007; Strydom & De Vos, 1998). Singh (2007) and Maree and Pietersen (2010) state that viral sampling is useful when a researcher is trying to reach populations

that are inaccessible or difficult to find, for example in the case of identifying injecting drug users.

In the context of this study, the potential population comprises:
- Directors of provincial library services in nine provinces in South Africa;
- Heads or representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal;
- Four hundred and sixty-three public libraries in three provinces (namely Gauteng, Limpopo and KwaZulu-Natal) in South Africa; each represented by one staff member. This excludes the 18 heads or representatives of public libraries, as they were interviewed separately.

It was vital to collect data from all nine provincial library services in South Africa. However, because of the large number of public libraries in South Africa and the diversity of their locations, it was not feasible to include public libraries from all nine provinces in South Africa.

Therefore, as mentioned in Chapter 1 (section 1.8.2), only public libraries from three provinces in South Africa (i.e. Gauteng, Limpopo and KwaZulu-Natal) were included in the sample. Gauteng is more advanced in terms of resources and the greater part of it is urban, while Limpopo and KwaZulu-Natal are less advanced and predominantly rural. This gave different perspectives of public libraries in developed and developing areas. These provinces were also easily accessible to the researcher. (The other six provinces are represented by their directors' participation in the semi-structured interviews).

The next subsections will discuss the procedure that was followed to choose each group of participants.

### 4.7.3. Directors of provincial library services

Since it was decided to invite all directors of provincial library services in South Africa, it was not necessary to sample them. Out of nine directors invited, only

seven agreed to participate in the study. Semi-structured interviews were conducted with the seven directors of provincial library services who agreed to participate.

### 4.7.4. Heads or representatives of public libraries

Heads or representatives from public libraries were primary participants in the study because they were involved in decision-making in their respective libraries. These heads or representatives were identified from their respective libraries and were all given an equal opportunity to participate in the study. As these heads are employed in different public libraries in Gauteng, Limpopo and KwaZulu-Natal, a sampling of these public libraries was essential. Given the limited resources for this study, such as time and money, and the fact that interviews had already been conducted with directors of provincial library services, it was decided that it would be best to use only 18 representatives. Therefore, a systematic random sampling strategy (Leedy & Ormrod, 2010) was used for selecting these public libraries. The followings steps were followed:

- A list of all public libraries in each province (i.e. Gauteng, Limpopo and KwaZulu-Natal) was compiled,
- A selection of every third name on the list was made until the desired number of 18 was reached,
- Selected public libraries were approached to permit the head or representative to participate in the study. All heads or representatives approached agreed to participate.

Semi-structured interviews were conducted with 18 heads/representatives of selected public libraries.

### 4.7.5. Public libraries in Gauteng, Limpopo and KwaZulu-Natal

 A list of all public libraries in three provinces was obtained from their provincial library services. It was decided to include all public libraries in the three provinces in the study. Therefore, it was not necessary to sample them. A questionnaire

was sent to all public libraries in Gauteng, Limpopo and KwaZulu-Natal. The questionnaire was distributed through their respective provincial library services, with a request that one representative from the library should complete the questionnaire. The reason for working through the provincial library services was that personnel of public libraries were more likely to respond to the questionnaire if they received this through their provincial library service. Another reason is that in some provinces, such as KwaZulu-Natal, it is standard procedure to distribute any documents to public libraries through the provincial library service.

**Table 4.3: Number of public libraries in Gauteng, Limpopo and KwaZulu-Natal, as provided by their provincial library services**

| Province | Number of public libraries | No of questionnaires returned | Percentage response rate per province |
|---|---|---|---|
| Gauteng | 234 | 130 | 55.55 |
| KwaZulu-Natal | 171 | 84 | 49.12 |
| Limpopo | 58 | 33 | 56.89 |

After determining the research approach and research population, it was essential to choose data collection techniques to be used in the study. The rationale for the decisions regarding the data collection techniques are explained in sub-sections 4.8.2 – 4.8.3, where each technique is succinctly discussed. Furthermore, examples of related studies that combined research techniques were provided in this chapter (Table 4.2).

The next section explains the data collection techniques and process for this study.

## 4.8. DATA COLLECTION TECHNIQUES

The aim of this section is to present the data-collection techniques used for this study. Data-collection techniques refer to types of data-gathering tools (Blaikie,

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2010; Fouché, 1998; Mouton, 2001; Nieuwenhuis, 2010). According to Maree and Pietersen (2010), data-collection techniques are methods used to collect data from the sample participants. According to Mouton (2001) and Creswell (2002), data may be gathered by a variety of data-collection methods. Examples of data-collection techniques often used are observations, interviews, questionnaires, focus groups, content analysis of documents, audio-visual materials, electronic documents such as e-mail messages, and internet websites (Blaikie, 2010; Creswell, 2002; Fouché, 1998; Leedy & Ormrod, 2010; Mouton, 2001).

Leedy and Ormrod (2010) maintain that data collected early in an investigation often influence the kinds of data that the researcher subsequently gathers. Fouché (1998) explains that the choice of data-gathering methods for the researcher working from a quantitative perspective can be categorised into questionnaires, checklists, indexes and scales. Questionnaires, interviews (structured), observation and content analysis of documents are especially popular to collect quantitative data (Blaikie, 2010; Creswell, 2002; Leedy & Ormrod, 2010). According to Blaikie (2010), Leedy and Ormrod (2010), Nieuwenhuis (2010), and Schurink (1998), the qualitative data-gathering methods used most often are observation, interview (in-depth) focus groups, content analysis of documents and audio-visual methodology.

From the literature and arguments presented above, it was decided that this study would use the following techniques to collect data:

- Literature survey
- Interviews with directors of provincial library services in South Africa (Appendix A)
- Questionnaires for heads or representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal (Appendix B)
- Interviews with representatives or heads of public libraries (Appendix C)

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- Follow-up interviews with directors of provincial library services in Gauteng, Limpopo and KwaZulu-Natal (Appendix D).

The next subsections discuss in more detail research techniques that were used in this study.

### 4.8.1. Literature survey

The literature survey for this study was carried out to obtain information relating to the general background and context of the study. According to Powell (2004), literature surveys may stand alone, but more often they are part of a larger study. Moreover, they are regarded as supportive of the research that follows rather than research studies themselves. According to De Vos (1998), a literature review usually consists of the examination of selected empirical research, reported practice and identified innovations relevant to the particular concern under study. According to Fouche and Delport (2005), a review of the literature has different purposes and strategies, depending on whether a researcher conducts a quantitative or qualitative research project, but it also has certain aspects common to both.

In this study, a literature survey was conducted on the concept of the digital divide, the challenges faced, causes of the digital divide, as well as the role of libraries in bridging the digital divide. Reports of efforts by library and information services were also covered. This helped to define the concept of the digital divide and to identify the issues that needed to be addressed in the model, as well as in the empirical component in the investigation of the digital divide and the role of public libraries in bridging the divide (non-empirical). This was fundamental, as it helped to define key concepts and lay the framework for this research design. Findings from the literature were used as a basis for the development of the proposed model (empirical).

## 4.8.2. Interviews

For the purposes of this study, individual semi-structured interviews were used as data-collection instruments. In semi-structured interviews, the researcher may follow up the standard questions with one or more individually tailored questions to get clarification or probe a person's reasoning (Leedy & Ormrod, 2003). According to McNamara (2004), interviews are particularly useful for trying to discover the context of participants' experience. According to Welman and Kruger (2001), semi-structured interviews are data-collection techniques in which some questions are structured (closed) and some are open-ended. Unstructured questions allow respondents to reply freely without having to select one of several responses provided (Rodrigues, Jacobs & Cloete, 2006). According to Moore (1999), semi-structured interviews are a halfway house between the formality of a structured survey and the flexibility of an in-depth interview. Kumar (2005:123) and Moore (1999) argue that semi-structured interviews are flexible in structure, content and questions.

Advantages of interviews:

- The advantages of interviews are that they help to encourage or put more pressure on a person to respond fully.
- They also provide a greater capacity for the correction of misunderstandings by participants (Bless *et al.*, 2006; Powell, 2004:113; Kumar, 2005:131).
- An interviewer can note conditions of the interview and probe with additional questions to obtain in-depth information (Cooper & Schidler, 2001; Cronje, 2008; Kumar, 2005:131; Mouton, 2001).
- They facilitate elimination of superfluous questions and the reformulation of ambiguous ones (Kumar, 2005; Leedy & Ormrod, 2003).
- Interviews can enable a researcher to establish rapport with potential participants and therefore gain their cooperation; thus interviews yield the highest response rates (Kumar, 2005; Leedy & Ormrod, 2003).
- Questions can be explained (Kumar, 2005).

- The researcher can receive an immediate response to a question, unlike other forms of data collection, which may result in significant delays in the data collection and analysis processes (Gorman & Clayton, 2005).

Disadvantages of interviews:

- The quality and quantity of information secured depend heavily on the ability and willingness of respondents to cooperate (Cooper & Schidler, 2001).

- Interviews are costly both in money and time (Cooper & Schidler, 2001; Fowler, 2009; Kumar, 2005; Leedy & Ormrod, 2003; Mouton, 2001).

- Interviews can influence the respondents in many ways: an interviewer can explain what kind of answer is sought, how complete it should be and in which terms it should be expressed (Cooper & Schidler, 2001; Mouton, 2001).

- If interviewers are not competent, they may introduce many biases (Kumar, 2005).

The researcher considered the above-mentioned disadvantages carefully, but kept to the decision to use interviews as a supplementary method of data collection. The decision was based on the fact that in-depth data was needed on the topic to allow the researcher to address the objectives of the study successfully. Moreover, it was envisaged that semi-structured interviews would assist to obtain data that could probably not be obtained through questionnaires.

In this study, interviews (see Appendix A) were conducted with the directors or their representatives from the controlling body of public libraries in South Africa, namely the provincial library services of Gauteng, Mpumalanga, Limpopo, Free State, Western Cape, KwaZulu-Natal and North West provinces. Unfortunately the following provincial library services did not participate in the study: Northern Cape and Eastern Cape (although their contact details were available, efforts to contact them proved very difficult). The purpose of the interviews with the provincial library services was to find out the following:

- **General institutional information:** Number of public libraries affiliated to the provincial library service; availability of documents containing information about their vision and mission; availability of documents containing information about their functions; availability of statistical information about the use of public libraries in the province and availability of any documents that might shed light on the issues of the digital divide and how they affect them.

- **ICT infrastructure:** Number of computers they have for use by staff at headquarters; number of computers connected to the internet; availability of a website; provision of ICT training to staff at headquarters, staff at public libraries and the public; provision of information literacy training and availability of an ICT unit to support the infrastructure.

- **Provincial library service and the digital divide:** Personal opinion on the digital divide; availability of policy on bridging the digital divide; details regarding their initiatives to address the digital divide; details regarding public libraries in their provinces that are involved in projects to address the digital divide; details regarding their future plans to address the digital divide; challenges affecting provincial library services and public libraries attempting to address the digital divide.

Further data were collected from selected public libraries in the three provinces (Gauteng, Limpopo and KwaZulu-Natal) by interviewing 18 heads of public libraries or their representatives (Appendix C). Eight representatives were from public libraries in Gauteng, six from KwaZulu-Natal and four from Limpopo. As explained in section 4.6.2, given the limited resources for this study, such as time and money, and the fact that interviews had already been conducted with directors of provincial library services, it was decided that it would be best to use only 18 representatives. The intention was to interview a decision-maker (i.e. the library manager/head) with the purpose to find out more detail than could be collected with a questionnaire on these libraries' role in reducing the digital divide, as well as their perspectives and opinions on the role public libraries can

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play in this regard. The sampling method for selecting the specific 18 heads/representatives from public libraries was explained in section 4.6.2.

The interview schedule addressed the following issues:

- **ICT infrastructure and services**: participants were asked to comment on the suitability of their ICT infrastructure (e.g. computers, internet access, budget, etc.) and the impact this had on bridging the digital divide (e.g. the availability of ICT to staff and the public).

- **Public library and the digital divide**: Participants were asked to comment on their personal opinion on the digital divide; the role public libraries can and should play in bridging the digital divide, as well as the reasons for their point of view; details regarding the public library's initiatives to address the digital divide; who should take the responsibility for addressing the digital divide; whether the public library staff are prepared and supported to address the digital divide; their opinion regarding partnerships with community members to address the digital divide; challenges encountered when addressing the digital divide and views on addressing such challenges.

- **Training of staff and users**: Participants were asked to comment on training necessary to address the digital divide; training initiatives by their library and whether their ICT training was linked to bridging the digital divide.

- **Plans and opportunities**: Participants were asked to comment on their plans for addressing the digital divide and strategies required to address the digital divide.

At the completion of the study, follow-up interviews were conducted with directors of provincial library services in Gauteng, KwaZulu-Natal and Limpopo. The purpose of the follow-up interviews was to gather more data on the progress made and new developments from the time of data collection in 2011/2012.Questions were asked on (see Appendix D) the availability of policy to

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bridge the digital divide, new initiatives to address the digital divide, statistics on how computers are used and what they are used for, perceptions of the reliability of internet connections, surveys to determine user needs, perceptions on support to users, marketing of services and the impact of mobile phones on information provision or other services.

### 4.8.3. Questionnaires

Data from the South African public librarian context were collected by means of questionnaires. According to Strydom (2005:166), the basic objective of a questionnaire is to obtain facts and opinions about a phenomenon from people who are informed on the particular issue. According to Babbie (2007), questionnaires are essential to and most directly associated with survey research; they are widely used in experiments, field research and other data-collection activities.

In this study closed (structured) and open (unstructured) format questions were used in the questionnaire. Open questions were used in combination with closed questions, meaning that questions were compiled according to structured response options. According to Schnetler (1989), structured questions are easy to answer and data-processing and analysis are facilitated by prior encoding.

There are advantages and disadvantages associated with questionnaires, which have been outlined in the literature. Some advantages are noted below.

Advantages of questionnaires include:

- Participants can respond to questions with assurance that their responses will be anonymous (Kumar, 2005; Leedy & Ormrod, 2003);
- It is relatively inexpensive to administer, can save time, human and financial resources (Kumar, 2005:130; Leedy & Ormrod, 2003);
- Participants are allowed to complete questionnaires, within limits, at their leisure. This encourages well-thought-out, accurate answers (Fowler, 2009; Strydom, 2005);

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- Questionnaires can be administered to a large number of people (McManara, 2004 as cited in Cronje, 2008; Leedy & Ormrod, 2003; Powell, 2004).

Disadvantages of questionnaires:

- Respondents may not answer questionnaire questions carefully and thoughtfully (Creswell, 1998; McNamara, 2004);
- Questionnaires are impersonal and there is no opportunity to clarify issues (Creswell, 1998; Kumar, 2005;  McNamara, 2004);
- A low response rate and response bias could occur (Kumar, 2005; Leedy & Ormrod, 2003);
- It is sometimes difficult to interpret subjects' responses (Leedy & Ormrod, 2003; Kumar, 2005).

As part of the survey a structured questionnaire (see Appendix B) seeking data from public libraries in South Africa was developed and distributed to public library services in Gauteng, Limpopo and KwaZulu-Natal. As noted in section 4.6.1, the questionnaire was distributed by the directors of the respective provincial library services. They distributed them to their public libraries through electronic mail as a Microsoft Word file attachment. The distribution and return of questionnaires via e-mail proved to be very reliable, fast and cost-effective.

The questionnaire requested information on the following:

- **General statistical information**: Name of the province, number of library staff; number of registered library users; approximate number of library visitors per day, approximate number of library visitors per week and any other statistical information that might be useful to the study.
- **Public library and internet access/provision**: Details of the library's website; number of computers in library for use by staff and the public; number of computers in the library connected to the internet; the period for

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which the library had been providing internet access to staff, members and non-members and cost of internet use.

- **Public library and addressing the digital divide**: Personal opinion on the digital divide; availability of policy on bridging the digital divide; details of the initiatives to bridge the digital divide; role the library could play to bridge the digital divide; barriers affecting public libraries in addressing the digital divide.
- **Education and training**: Availability of training to staff, members and non-members; the contents of training that the library offers and the type of training the library offers.
- **Public library's involvement with communities and plans for future**: Library's partners in efforts to address the digital divide; library's plans for the near future to address the digital divide and who staff members think should take the initiative to address the digital divide.

## 4.9. LIMITATIONS OF THE STUDY

The challenge is to present useful findings and an analysis of the role and efforts of public libraries in reducing the digital divide. Though this aspect was discussed in Chapter 1, this serves to remind the reader of the limitations. The researcher could not conduct a survey of all public libraries throughout South Africa, given the lack of project funding and time constraints. Instead, the researcher chose to study three provinces, i.e., Gauteng, Limpopo and KwaZulu-Natal. Although he looked for patterns and trends common to all that might be indicative of national trends or issues, additional insights might have been gained if libraries from all provinces had been included in the survey.

## 4.10. RELIABILITY AND VALIDITY IN RESEARCH

According to Gay *et al.* (2009:154), if the researchers' interpretations of the data collected are to be valuable, then the measuring instruments used to collect the data must be both valid and reliable. In principle, the value of any kind of research depends on the credibility of its research findings. This seems to be the case in all the disciplines and all the research methods used for data collection and analysis. Powell and Connaway (2004:43) affirm this by explaining that as one develops and conducts a research study, one should always be concerned with its validity and reliability. Some studies that were reviewed for this study indicated how the issues of reliability and validity were incorporated in their research. Two examples are the work of Chiware (2008) and Mutshewa (2006). Therefore, the validity and reliability of the survey research are discussed below.

### 4.10.1 Reliability

According to Pickard (2013), reliability is concerned with the stability of the research findings over time and across locations. Typically the test and retest method is used to demonstrate reliability. The underlying issue here is whether the process of the study is consistent, reasonably stable over time and across researchers and methods (Miles & Huberman, 1994).

### 4.10.2 Validity

Pickard (2013) describes two types of validity: internal validity and external validity. Internal validity relates the way in which causal relationship is demonstrated. Is it clear that the effect is indeed attributable to the cause? (Pickard, 2013). External validity is concerned with the extent to which findings from the investigation can be generalised to the wider context (Pickard, 2013). According to Creswell (2003), some of the approaches to data validation include:

- Data transformation: a researcher may quantify the qualitative data. This involves creating codes and themes qualitatively, then counting the

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number of times they occur in the text data (or possibly the extent of talk about a code or theme by counting lines or sentences). This quantification of data then enables a researcher to compare quantitative results with qualitative data.

- Instrument development: in a sequential approach, the researcher obtains themes and specific statements from participants in an initial qualitative data collection. In the next phase, the researcher may use these statements as specific items and the themes for scales to create a survey instrument that is grounded in the views of the participants.

- Examine multiple levels: in a concurrent nested model, a survey is conducted at one level (e.g. with families) to gather qualitative results about a sample. At the same time, the researcher conducts qualitative interviews (e.g. with individuals) to explore the phenomenon with specific individuals in families.

In this study, the value of the research findings is ensured by addressing the issues of both reliability and validity in the following manner:

- Triangulation was applied by using different sources of data as well as different methods of data collection. The findings from various sources of data, i.e. questionnaires, interviews and available policy documents, were compared. The objective was to boost confidence in the research findings.

- The questions were constructed in a concise manner in order to avoid ambiguity. In addition, an explanation of the research aims was provided to the respondents to give them some information about the study.

- All the respondents who participated in the study were assured of confidentiality. The respondents were not asked for their names, so that they could freely respond to the questions without any fear of being identified. This is believed to contribute to the true picture of the situation as seen and experienced by the respondents.

The next section explains how data were analysed.

## 4.11. DATA ANALYSIS

Both qualitative and quantitative data were collected for this study. Therefore, data had to be analysed qualitatively and quantitatively.

### 4.11.1. Analysis of quantitative data

According to Leedy and Ormrod (2010:253), in quantitative data analysis the researcher employs statistical procedures. However, the data must be organised first. In quantitative analysis, the researcher identifies the statistics and statistical computer program for testing the major questions or hypotheses in the proposed study (Creswell, 2002). In quantitative data analysis, data can be classified into metric and non-metric data, based on metric properties defining the distance between scale and values (Singh, 2007). A dataset from quantitative responses from the questionnaires was created using Microsoft Excel and analysed using SPSS software. Each questionnaire that was returned was studied and checked to determine any errors. Content analysis was also done on open-ended questions.

### 4.11.2. Analysis of qualitative data

Nieuwenhuis (2010:99) explains that the literature on qualitative data analysis documents a range of approaches, processes and procedures through which researchers extract some form of explanation, understanding or interpretation from qualitative data collected from the people and situations that they are investigating. Leedy and Ormrod (2010) assert that in qualitative data analysis, the researcher begins with a large body of information and must, through inductive reasoning, sort and categorise it and gradually boil it down to a small set of abstract, underlying themes. Creswell (2002:191) explains that qualitative data analysis entails making sense out of text or images. It involves preparing the data for analysis, conducting different analyses, moving deeper and deeper to understanding the data, representing the data and forming an interpretation of the larger meaning of the data. Blaikie (2010) concludes that the central activity

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in qualitative data analysis is a special kind of coding. Such coding can facilitate description, but is also used for analysis and theory generation.

In this study qualitative data were generated through interviews with directors of provincial library services and heads or representatives of public libraries, as indicated in the previous sections. The researcher relied on field notes only in order to capture the essence of interviews. The reason why the researcher made notes and did not tape the interviews was that the Ethics Committee of the Faculty of Engineering, Built Environment and Information Technology was concerned about tape-recording and recommended that perhaps it should not be done. The responses were studied and in some instances summarised. The qualitative responses collected during interviews were also captured using Microsoft Excel. The following steps were taken in analysing the qualitative data:

- Re-reading the text several times, writing down some impressions;
- Content analysis: this entails identification and summarising of contents in brochures, strategic documents provided during the collection of data, and coding according to the focus of the study;
- Identification of issues in alliance with the questions the study was trying to answer;
- Categorising the information; the main task here was to determine themes and patterns (ideas, terminology, phrases, concepts, etc.) that could be organised into categories that summarise and impart meaning to the data collected.

Table 4.4 presents examples of how responses were categorised.

**Table 4.4: Example of questions and categories**

| Question | Categorisation of responses |
|---|---|
| 1. Can you please explain what role you think public libraries can and should play in bridging the digital divide? | Training (Trg), access to computers (PC), internet access (Int), information literacy (IL). |
| 2. Is your library involved in any initiatives in an attempt to address the digital divide? | Computer access (PC), training (Trg), working with community (WC), internet provision (Int). |

| 3. Who should take responsibility for bridging the digital divide? | Local municipality (LM), provincial library services (PLS), public libraries (PL), national government (Ngvt). |
|---|---|

Abbreviations used for coding are indicated in parentheses.

- The next step was to interpret and analyse the data. This was necessary to find the meaning and significance of the analysis;
- Where appropriate, quotations were used to add support to the data interpretation. Confidentiality and anonymity were taken into consideration when using quotations, as well as for all other data collected

## 4.12. ETHICS IN RESEARCH

Ethical issues arise out of interaction with other people, other beings (such as animals), and the environment, especially where there is potential for, or actual conflict of interests (Babbie & Mouton, 2001). According to Creswell (2003), researchers must anticipate that during data collection, they need to respect the participants and the sites for research. Many ethical issues arise during this stage of research. According to Miles and Huberman (1994), any researcher who is not asleep ponders moral and ethical questions: is my project really worth doing? Do people really understand what they are getting into? Am I exploiting people with my incorrect questions? What about privacy? According to Salant and Dillman (1994: 9), any time a researcher asks people to participate in a survey, it is his/her responsibility to respect both their privacy and their voluntary participation. Sieber (1992), as cited in Miles & Huberman (1994) offers core principles to guide ethical choices, including:

- Beneficence – maximising good outcomes for science, humanity, and the individual research participants while avoiding or minimising unnecessary harm, risk or wrongdoing.
- Respect – protecting the autonomy of (autonomous) persons with courtesy and respect for individuals as persons, including those who are not autonomous (infants, the mentally retarded, senile persons)

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- Justice – ensuring reasonable, non-exploitative, and carefully considered procedures and their fair administration; fair distribution costs and benefits among persons and groups (those who bear the risks of research should be those who benefit from it).

In the context of this study, ethical issues were addressed in the following manner:

- Permission to carry out the research was obtained from the Research Ethics Committee in the Faculty of Engineering, Built Environment and Information Technology, University of Pretoria. The committee scrutinised the data-collection instruments to ensure that all questions adhered to ethical principles and were not offensive.
- Permission to carry out research involving public libraries in Gauteng, Limpopo and KwaZulu-Natal was obtained from their respective provincial library services; a motivation letter was written to explain the objectives of the study.
- Consent forms (see Appendix E) were developed for the participants in the questionnaires and interviews. The form had to be signed by the participants during the interviews and when completing the questionnaire.
- Confidentiality and anonymity were ensured by coding responses.

In the study on mobile learning and digital divide by Harpur and De Villiers (2012), a survey was carried out to determine the nature and extent of the digital divide among third-year undergraduate students enrolled for a software engineering course on two different Western Cape campuses. They reported that in line with several authors who addressed issues of ethics in research, such as Olivier (2009), ethical consent was obtained, and confidentiality and anonymity were ensured.

Gudmundsdottir (2011), in his study on critical perspectives on the digital divide in South African schools, reported that a discussion was held with the principals of the schools regarding the outline of a parental acceptance form. The

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researcher also sent an introductory letter, together with a parental consent letter, in the appropriate language for the learners/parents in the participating schools. The principals added the school's letterhead to the form and signed it as an indication of approval and of the school's participation in the project. In her study on the role of public libraries in bridging the digital divide: a case study of Cape Town, Khathi (2013) reported that the rights of the participants to remain anonymous were respected at all times and confidentiality was maintained throughout the research project. Participants were informed of the purpose of the study and that they had the right to withdraw from the research when they wished. The people interviewed at Masiphumelele were asked to sign a consent form. These examples of adherence to ethical research conduct were noted in conducting and reporting on this study.

## 4.13. CONCLUSION

This chapter described the research methodology and specific research methods that were used in this study. The study used both qualitative and quantitative methodologies, as explained in this chapter. The first phase of the research project, namely defining the research problem and objectives, was discussed in Chapter 1. This chapter discussed the research methodology in more detail. The chapter further explained the population for this study and sampling techniques that were used. It also explained how data were collected and it addressed the limitations of the study. The chapter ended by discussing the data analysis process, which was conducted both qualitatively and quantitatively. The next chapter will discuss the actual analysis of the data and interpretation thereof.

# CHAPTER 5: ANALYSIS AND INTERPRETATION OF DATA

## 5.1. INTRODUCTION

The previous chapter outlined the research methodology used to conduct this study. This chapter presents data that were collected to investigate the role of public libraries in addressing the digital divide in South Africa. Data are presented in three sections. The first section is data collected from directors of provincial library services. This is followed by data from public libraries in Gauteng, Limpopo and KwaZulu-Natal and lastly data collected from heads/representatives of public libraries in these provinces. The central research problem (as briefly discussed in Chapter 1, section 1.5) focuses on the question of what role public libraries can play in bridging the digital divide and how they can do this.

To address this, the study conducted semi-structured interviews with directors of seven provincial library services; questionnaires were used to collect data from public libraries in three provinces in South Africa (Gauteng, Limpopo and KwaZulu-Natal) and semi-structured interviews were conducted with representatives of 18 public libraries in these provinces.

Data will be presented and discussed according to different categories/groups and methods used. Details of techniques on data collection were provided in Chapter 4. Data are presented based on the categories of the participants as follows:

- Data collected from directors of provincial library services
- Data collected through questionnaires from public libraries in Limpopo, Gauteng and KwaZulu-Natal
- Data collected through interviews with representative/heads of public libraries in Limpopo, Gauteng and KwaZulu-Natal

The findings will be discussed under separate sub-headings.

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## 5.2. DATA COLLECTED FROM DIRECTORS OF PROVINCIAL LIBRARY SERVICES

As explained in Chapter 4 (section 4.7.3), data were collected from directors of provincial library services in South Africa. Semi-structured interviews were used to collect these data from seven directors of these provincial library services. Although all nine provinces were invited to participate in the study, only seven provinces participated. The data are presented according to general information, ICT infrastructure, provincial library services and the digital divide, and suggestions. The data were collected in 2011 and 2012.

### 5.2.1. General information

Data presented in this subsection provide a brief outline of general information of the provincial library services that participated in the study. This information was collected with regard to the number of public libraries affiliated, documents that contained information on the mission and vision and functions of provincial library services, statistical information and other documents.

South Africa has nine provinces. Figure 5.1 indicates the seven participating provincial library services in South Africa.

**Figure 5.1: Map of participating provincial library services in South Africa**
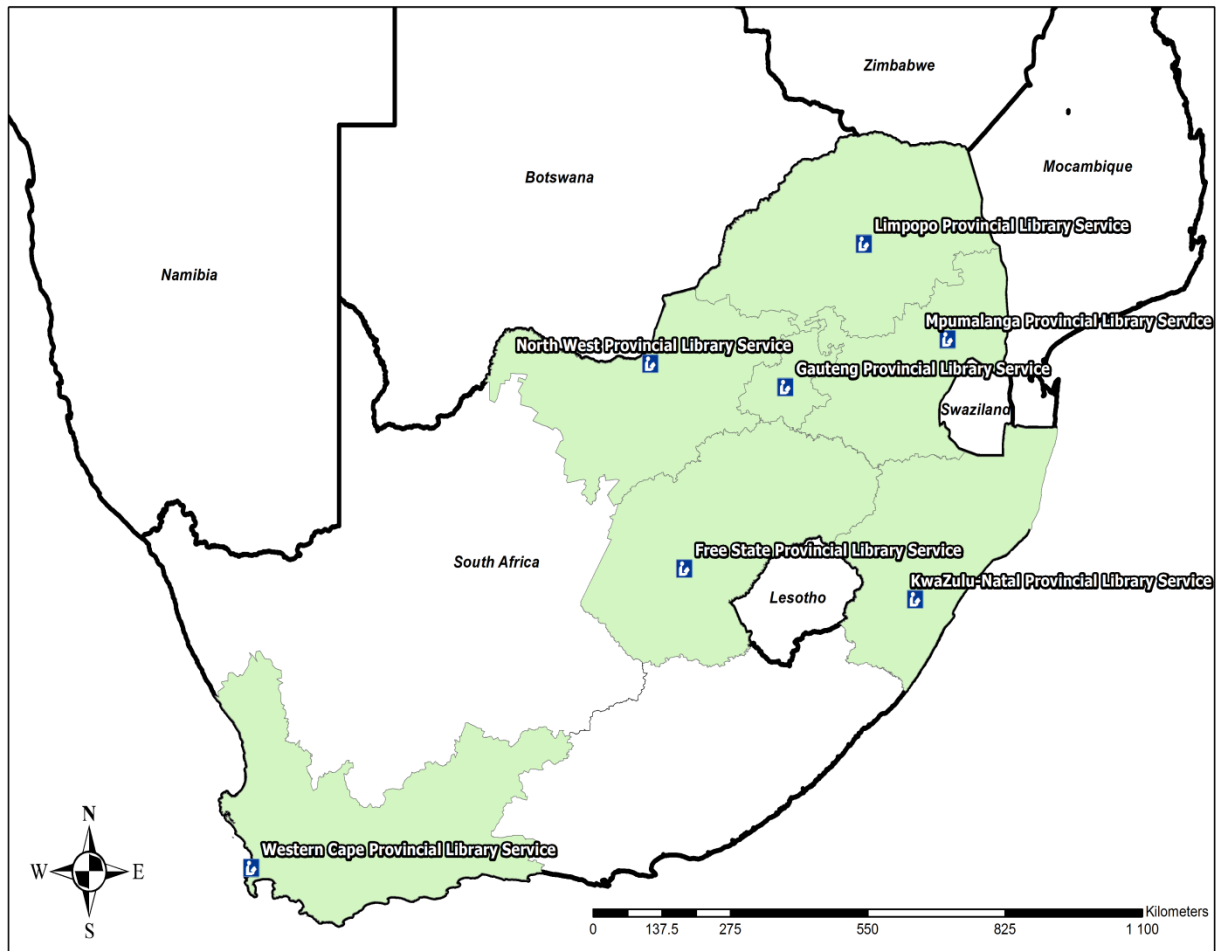


**(a) Number of affiliated public libraries**

Participating provincial library services were asked to provide details about the number of affiliated public libraries. The Western Cape had the highest number of affiliated public libraries, while Limpopo has the lowest number of affiliated public libraries.

Table 5.1 presents the number of affiliated public libraries in each participating provincial library service. This is also depicted in Figure 5.1.

**Table 5.1: Number of affiliated public libraries per province**

| Provinces | No of affiliated public libraries |
|---|---|
| Western Cape | 339 |
| Gauteng | 234 |
| Free State | 171 |
| KwaZulu-Natal | 171 |
| Mpumalanga | 139 |
| North West | 102 |
| Limpopo | 58 |

Table 5.2 indicates the number of public libraries of participating provincial library services, the population numbers per province and approximate number of people that could be serviced by each library. Numbers of population per province were found in a mid-year population statistics report for 2014 released by Statistics South Africa (2014). The total number of the population at the time was 54 002 000 (Statistics South Africa, 2014). The total number of the population has been included in Table 5.2 because it can affect the people that may be touched by the public libraries' efforts.

**Table 5.2: Number of affiliated public libraries in participating provincial library services, the estimated population per province and approximate number of people that could be serviced by each library**

| Provinces | Number of affiliated public libraries N=1 214 | Population estimate N=54 002 000 | Approximate number of people that could be serviced by each library |
|---|---|---|---|
| Western Cape | 339 | 6 116 300 | 18 042 |
| Gauteng | 234 | 12 914 800 | 55 191 |
| Free State | 171 | 2 786 800 | 16 297 |
| KwaZulu-Natal | 171 | 10 694 400 | 62 540 |
| Mpumalanga | 139 | 4 229 300 | 30 426 |
| North West | 102 | 3 676 300 | 36 042 |
| Limpopo | 58 | 5 630 500 | 97 077 |

Based on Table 5.2, there is one library for 16 297 00 people in the Free State, while in Limpopo this rises to one library for 97 077 00 people, thus indicating a big difference in the provision of library and information services in provinces.

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**(b) Documents that contain information on the vision and mission of the provincial library services**

All provincial library services that participated in the study reported that they had documents containing information on their mission and vision. This information was contained in the strategic plan and brochure documents of the respective provincial departments under which they fell. Their mission and vision statements did not address the digital divide or shed any light on this matter.

**(c) Documents on the functions of the provincial library services**

Participants were asked to indicate if they had documents on the functions of provincial library services and to indicate if they were willing to share these with the researcher. All participating provincial library services shared the documents with the researcher. The following is a synthesis of functions of provincial library services as contained in various documents, such as brochures, strategic plans and annual reports that were made available by participants:

- Improvement of access to public libraries and archives, while striving for equitable distribution and access by all communities;
- Improvement of service delivery through promotion, training, and promotional support;
- Provision of public library services to affiliated municipal public libraries throughout the respective provinces;
- Support and assistance to municipal libraries to provide information resources, services to communities, and access to information through information and communication technology via targeted fund transfers to municipalities;
- Promotion of the use of public libraries and assistance to municipalities with the planning and building of new or upgraded libraries (within the constraints of available resources);
- Rendering a record management service to governmental bodies;

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- Processing and distributing information resources (e.g. books, serials, etc.) to public libraries;
- Coordinating resource sharing and providing inter-library loan services to public libraries;
- Developing, coordinating, implementing, maintaining and monitoring theme-based reading awareness and library promotion programmes in public libraries;
- Developing and implementing library norms and standards;
- Collation, compilation and analysis of annual statistical reports;
- Facilitation, implementation, monitoring and evaluation of policies and guidelines;
- Ensuring the effective and efficient functioning of public library, information and archival services in the province.

## (d) Statistical information available on the use of the public libraries in the province

All provincial library services kept some form of statistical information. Public libraries submit annual statistics to provincial library services either online or manually, and in other cases, public libraries from districts or municipalities submit these statistics on a monthly basis. Of the issues on which they keep statistics (i.e. the number of public libraries, items circulated per year, items of library material in provincial stock, visits by library users, new items provided to public libraries, training programmes provided to public libraries, periodical subscriptions, public library staff), the number of ICT users is of specific significance in addressing the digital divide. Only Gauteng Provincial Library Service has statistics relevant to addressing the digital divide. Officials keep statistics on ICT users (they refer to library users who use computers to access the internet). In their 2010/2011 statistical report they recorded 70 500 ICT users.

**(e) Other documents or information shedding light on the issue of the digital divide and how it affects the provincial library services**

As indicated earlier in this section, all provincial library services participating in the study had documents on their functions. Most of these documents were in the form of brochures and booklets. Provincial library services were also asked to share other documents that might shed light on the issue of the digital divide. All participating provincial library services shared additional documents with the researcher. The information was in the form of strategic objectives, accomplishment as contained in the annual reports and plans for the future as contained in the strategic planning and performance review documents. However, none of the provincial library services had policy documents or guidelines that explicitly addressed the issue of the digital divide.

In order to understand the role or efforts of provincial library services in addressing the digital divide, strategic plans, annual reports and relevant brochures of participating provincial departments and provincial library services were analysed. Selected findings from these documents with regard to their input in addressing the digital divide are presented in Table 5.3. This table attempts to distinguish between efforts undertaken and efforts intended at the time of data collection.

**Table 5.3: Efforts on bridging the digital divide as presented in the strategic documents of participating provincial library services**

| Provincial library services | Efforts to address the digital divide (efforts undertaken and intended at the time of data collection) | Type of document (s) provided |
|---|---|---|
| North West | At the time of data collection the province had achieved the following: 21 community libraries had been provided with public internet access, librarians had been trained on the use of ICT and infrastructure for network connections had been provided.<br><br>At the time of data collection the province intended to achieve the following: establish and maintain ICTs in | Brochure of the Directorate of Library, Information and Archive Services<br><br><br><br>Strategic Plan 2011-2016 of Sports, |

| | | |
|---|---|---|
| | community/public libraries, ensure that the ICT needs of public libraries are catered for, administer the library system and the use of ICT in public libraries, provide ongoing support on the use of ICT in public libraries. | Arts and Culture |
| KwaZulu-Natal | At the time of data collection, the province had managed to connect some public libraries with internet access. They also distributed several computers to these libraries.<br><br>At the time of data collection, the province was intending to distribute more computers and allocate more funding to public libraries. They also intended to provide library infrastructure and relevant ICT facilities. | Strategic Plan 2010-2014 of Department of Arts and Culture |
| Mpumalanga | At the time of data collection, the province had achieved the following: installation of internet access in public libraries, provision of network cables to 46 public libraries and computer hardware and software to 49 public libraries.<br><br>At the time of data collection, the province intended to make R5.5 million available to be used for the ICT programme to ensure that all 18 municipalities are provided with internet services, the State Information Technology Agency (SITA) library management system and IT software and hardware. | Policy and Budget Speech 2011/2012: Department of Culture, Sport and Recreation. |
| Free State | At the time of data collection, the province had achieved the following: computers and communication lines were installed at 45 libraries and provided line connection to libraries that received computers from municipalities.<br><br>At the time of data collection the province intended to provide new library buildings with ICT infrastructure, extend ICT infrastructure for public libraries and implement ICT infrastructure successfully, as it contributed greatly to the Free State Growth Development Plan's objective to provide online access for communities. | Three-year Annual Performance Plan 2008/09 – 2010/11: Department of Sports, Arts, Culture and Recreation<br><br><br>Annual Report: Department of Sports, Arts, Culture and Recreation. |
| Gauteng | At the time of data collection, the province had provided computers and internet access to public libraries. With regard to ICT projects, centralisation of internet services at libraries was investigated and the outcomes of the investigation were implemented. | Annual Performance Plan 2011/2012: Department of Sports, Arts, Culture and Recreation |

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| | At the time of data collection, they intended to implement their plans to provide public libraries with internet access. | |
|---|---|---|
| Western Cape | At the time of data collection the province had achieved the following: in order to enhance service delivery to rural areas and to bridge the digital divide, the rural ICT project was extended to 20 additional sites during 2009/10. This project provides free ICT, which includes access to the internet at public libraries in rural areas. The project was funded through conditional grant funding received from the National Department of Arts and Culture. Service delivery was enhanced by these ICT projects and all libraries where these facilities had been installed reported an increase in membership and use of libraries. In an endeavour to bridge the digital gap between urban and rural areas, the Library Service, in partnership with e-Innovation and with funding from the Conditional Grant, provided 20 libraries with ICT infrastructure. This infrastructure provides free public access to the internet. | Strategic Plan 2010-2015: Department of Cultural Affairs and Sport |
| | At the time of data collection, the province intended to develop and upgrade infrastructure and software, including the purchase of new internet-based computerised library and information systems. | Annual Report 2010/11: Department of Cultural Affairs and Sport |
| Limpopo | At the time of data collection, the province had achieved the following: public libraries were connected with the internet, and a local area network was installed in public libraries. | Limpopo Province Business Plan 2010 |
| | At the time of data collection, the province intended to provide the infrastructure required for public library services, namely buildings and ICT, and to provide and deploy mobile library services to remote areas in order to improve access to information in such areas and to provide funding for the building, stocking, ICT and staffing of new public libraries. | Department of Sports, Arts and Culture 2006/07 |

## 5.2.2. Provincial library services ICT infrastructure

This section will address the ICT infrastructure available in the provincial library services. This will include the following: number of computers at participating provincial library services, number of computers available for use by staff at their respective headquarters and number of computers connected to the internet,

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availability of a website for the provincial library service, provision of ICT training, provision of information literacy training and availability of an ICT unit or supporting infrastructure at the provincial library service.

### (a) Number of computers at provincial library services

All seven provincial library services had computer facilities. Detail is indicated in Table 5.4. These were only the computers at the headquarters, not including any computers at the parent department.

**Table 5.4: Number of computers at the participating provincial library services' headquarters**

| Provinces | No of computers at provincial library services' headquarters N=499 |
|---|---|
| Western Cape | 165 |
| KwaZulu-Natal | 150 |
| North West | 113 |
| Free State | 25 |
| Limpopo | 21 |
| Mpumalanga | 15 |
| Gauteng | 10 |

The Western Cape Provincial Library Service had the largest number of computers (165) at its headquarters, followed by KwaZulu-Natal with 150 computers. Gauteng had the lowest number of computers (10) at its headquarters. There is thus considerable disparity in terms of computers at the respective provincial library services.

### (b) Number of computers connected to the internet

All computers in all seven provincial library services were connected to the internet, except for two computers in Limpopo.

### (c) Provincial library services' websites

All participating provincial library services indicated that they did not have their own website. They depended on the website of their parent provincial

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department. This implies that their information was accessed via their parent department's website. Tracing provincial library services is thus difficult, since one first needs to know under which provincial department a library service falls in order to access its website. Only one provincial library service (North West) indicated that it was in the process of constructing its own website to support the provision of services and information dissemination. The researcher checked in February 2014 and April 2015, but the website was still not in place.

**(d) ICT training**

Provincial library services were requested to indicate whether they provided training to the following: staff at headquarters, staff from public libraries and to the public. This is reflected in Table 5.5.

**Table 5.5: ICT training by provincial library services**

| Provinces | Staff from headquarters | Staff from public libraries | Public |
|---|---|---|---|
| Free State | √ | √ | |
| KwaZulu-Natal | √ | | |
| Gauteng | √ | | |
| North West | √ | √ | √ |
| Western Cape | √ | | |
| Limpopo | √ | | |
| Mpumalanga | √ | √ | |

Table 5.5 shows that all provincial library services included in the study did provide training to their staff at their headquarters. Three provincial library services reported that they also provided training to staff members at public libraries, while four indicated that training of staff from public libraries was done by the relevant municipalities; the provincial library services only provided funding to municipalities, which in turn arranged for the relevant training. Only one provincial library service, North West, reported that it provided training to members of the public. Other provincial library services reported that staff members from public libraries provided training to the public. Three provincial library services indicated that they provided training to staff from public libraries who then provided training to the public.

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At some provincial library services training is centralised to the parent organisation/department or is outsourced to other service providers. For example, in some cases the Human Resources Unit of the parent department arranges the training. External service providers sometimes provide training on the use of a specific database or software.

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**Selected responses to the interview question: Does the provincial library service provide ICT training to the following: staff from headquarters, staff from selected libraries and the public?**

- *Training is normally a function by departmental human resources unit. But if there is training on how to use for example e-journals, we normally use external vendors such as Sabinet to provide training. They also extend training to the rest of the staff working at the department. Most of the personal assistants are trained to do research for their bosses.*
- *Yes, we do provide ICT training to our staff at the headquarters especially if there is a new system that has been introduced. There is continuous training though. We also provide training to staff from affiliated public libraries. They either come to the provincial library services or we send our staff to go train them at their public libraries.*

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**(e) Information literacy training**

The information literacy training provided by provincial library services is reflected in Table 5.6.

**Table 5.6: Information literacy training provided by provincial library services**

| Provinces | Staff from headquarters | Staff from public libraries | Public |
|---|---|---|---|
| Free State | √ | √ | √ |
| KwaZulu-Natal | √ | Does not provide | Does not provide |
| Gauteng | Does not provide | Does not provide | Does not provide |
| North West | √ | √ | √ |
| Western Cape | Does not provide | Does not provide | Does not provide |
| Limpopo | Does not provide | Does not provide | Does not provide |
| Mpumalanga | √ | √ | Does not provide |

As indicated in Table 5.6, only two provincial library services provide information literacy training to all three groups: staff from headquarters, staff from public libraries and to the public. All provincial library services indicated that although they provided training to staff at headquarters, training to staff at public libraries was done either by the public libraries themselves or local municipalities.

### (f) ICT unit and/or supporting infrastructure at provincial library services

Only three provincial library services had established their own ICT department/unit charged with the responsibility of taking care of their ICT facilities. The rest of the provincial library services indicated that they obtained support from the parent organisation's ICT departments (i.e. the department under which they fell) or external service providers contracted to maintain the headquarters' library ICT infrastructure. Even though some provincial library services did have their own ICT unit, they also had the advantage of access to their parent organisation's ICT unit.

One notable feature of four provincial library services is that they have systems librarians. These librarians have the necessary skills to ensure that the libraries can use automated and integrated library systems. They also provide training on electronic systems used in libraries. All systems librarians have a national forum where they share best practices. The forum is coordinated by the National Department of Arts and Culture. Participants indicated that the forum attempted to addresses some aspects of the digital divide, e.g. during this forum different

provincial library services presented the status of ICTs at their public libraries and efforts to address internet access and provision of computers.

### 5.2.3. Provincial library services and the digital divide

This section reflects the analysis of participants' personal opinion of the concept of the digital divide, the availability of policies on bridging the digital divide, initiatives to address the digital divide, digital divide projects by public libraries, plans to bridge the digital divide, challenges affecting provincial and public library services and suggestions on strategies to address the digital divide.

### (a) Personal opinion on the digital divide

Participants were requested to share their personal opinion on the digital divide. They viewed the digital divide as a challenge and stressed the need to bridge it, especially with regard to lack of access to ICT. When analysing their feedback, it was found that their perceptions focused on lack of access to the internet, the gap between the rich and the poor and the need for public libraries to play a role in addressing the digital divide. Table 5.7 indicates all responses from participating provincial library services. The researcher did not edit or correct the grammar of their statements in the relevant column. This applies to all cases where responses are presented.

**Table 5.7: Responses on opinions on the digital divide from participating provincial library services**

| Provincial library services | Response |
|---|---|
| Free State | *I think it is important to render services to public who cannot afford to access the internet. I think public libraries must take up the challenge to provide this services that will help to bridge the digital divide. There is still a divide between the rich and the poor. There are many people who still can't get access to the internet.* |
| KwaZulu-Natal | *It is no longer a real challenge like in the past because with the mobile phone penetration people are able to access and use the internet. So things have changed whereby you only need a computer to access the internet. I think the government is also trying to play its role on the digital divide since now the focus is more libraries in the rural areas.* |
| Gauteng | *It's a way of the future. If we want to keep youth, we need to provide services that* |

| | |
|---|---|
| | *will suit their needs such as provision of internet services. We must bring services such as e-books. It might be challenging to users though as some have never touch computer before.*<br>*The more we move to the mobile industry, there are issues of economic development and sustainability.* |
| North West | *It's really necessary for SA to bridge the divide, change in order with the world.* |
| Western Cape | *There is indeed a gap. We must try to bridge it. That's why we started the project in 2009 in attempt to bridge the digital divide.* |
| Mpumalanga | *We should all participate in bridging the digital divide. We could make this world a better place.* |
| Limpopo | *There are many people who are left behind since they do not have access to computers.* |

## (b) Policies on bridging the digital divide

All participating provincial library services indicated that they did not have a policy on bridging the digital divide. One provincial library service reported that in its strategic document it tried to identify measures to address the digital divide by rolling out ICTs to public libraries and by maintaining the ICT. The others did not respond when prompted to elaborate on their lack of a policy. It seemed as if the formulation of policies on bridging the digital divide is viewed as a function of the national government.

## (c) Initiatives to address the digital divide

Provincial library services were asked to indicate any initiatives on addressing the digital divide. All participating provincial library services reported one or more initiatives, covering a wide spectrum. The following initiatives were mentioned:

- **The Free State Provincial Library Service** planned to acquire more ICT equipment and to offer dedicated ICT training and information literacy training to library users. The Project Libraries Online Programme (a three-year project to bring computer technology to the Free State provincial libraries) had reached about 40 libraries at the time of data collection. These public libraries each received a maximum of 10 computers. These computers were intended to provide internet access to the public, including electronic research information sources such as encyclopaedias.

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The project included training for the library personnel who were expected to share their knowledge with the public.

- **The KwaZulu-Natal Provincial Library Service** reported the "Internet @Your Library Project", funded by the National Department of Arts and Culture in the form of a conditional grant. As part of this project it provided 62 public libraries with computers and internet access for use by the public. Staff members were employed on a contract basis to work specifically at the internet centres at the public libraries. The appointment of young men and women with IT expertise is referred to as the Cyber-Cadet Concept. They assist library users with setting up e-mail accounts and help people to improve their basic skills.

- **The Gauteng Provincial Library Service** has since 2005 identified two priorities, including the provision of sufficient access to computers, internet services and training.

- **The North West Provincial Library Service** embarked on an ongoing project regarding public internet access during the 2007 financial year. The focus was on connecting public libraries in rural areas. At the time of data collection, 21 public libraries could offer internet access to the public. The project was funded by a conditional grant from the National Department of Arts and Culture and the National Library.

- **The Western Cape Provincial Library Service** focused on providing computer access to public libraries. At the time of data collection 60 public libraries had been equipped with computers and an internet connection. The Provincial Library Service was also on the verge of connecting an additional 21 public libraries. In its SMART project, 160 libraries had been given access to computers and the internet. It also provided hardware and software to these public libraries. The Rural Library Connectivity Project played a major role in increasing opportunities for rural communities through modern ICT technologies. Rural libraries were connected to the internet and this enabled library users to connect to the internet and use computers free of charge.

- **The Mpumalanga Provincial Library Service** began by acquiring computers with funding from the provincial government. To develop ICT usage in public libraries in Mpumalanga, the Provincial Library Service successfully applied for a grant from the Carnegie Corporation of New York to embark on an ambitious three-year ICT project called Building Electronic Bridges (BEB). The main objective of the project was to provide each public library with one computer and printer and to train the library staff in the use of the hardware and the applicable software. Through the BEB project, the Provincial Library Service was able to provide 68 computers in 26 municipalities. The public libraries started to use the internet mainly as a result of the BEB project.

- **The Limpopo Provincial Library Service** used a donation of 125 computers from the embassy of the USA to enhance computer access in all the libraries. It also embarked on a project to provide internet access to public libraries. It could unfortunately not provide further details on the project.

**(d) Digital divide projects by public libraries**

The provincial library services were asked during the semi-structured interviews to indicate if they were aware of any digital divide projects undertaken/initiated by public libraries under their jurisdiction. This question was mainly directed at other provinces while using it as a control measure for Limpopo, Gauteng and KwaZulu-Natal, where questionnaires containing a similar question were distributed to the public libraries.

Table 5.8 reflects some of the key digital divide projects by individual public libraries, as reported by the participating provincial library services. The question also asked about funders and partnerships formed.

**Table 5.8: Digital divide projects in three participating provinces**

| Provinces | Nature of the projects | Funders | Partnerships formed |
|---|---|---|---|
| North West | Rustenburg library provided pay point internet access in the library. Klerksdorp library initiated a similar project. | Relevant local municipalities | No information provided on partnerships |
| Western Cape | Projects to close the digital divide were undertaken at a few public libraries, which provided computers and access to the internet. Approximately ten public libraries were involved in digital divide projects. Most of these public libraries fell under the City of Cape Town metropolis. | Bill Gates Foundation, Desmond Tutu Foundation, Provincial Library Service | Provincial Office of the Premier |
| KwaZulu-Natal | In Nquhutu, in the rural north of KwaZulu-Natal, the local librarian and headmasters of schools in the area participated in a government initiative to provide laptops to teachers. With the help of Cyber-Cadet projects the teachers were trained to use the laptops and efficient use of the technology was thus ensured. | | Local schools and Department of Education |

Other provincial library services indicated that they were not aware of any digital divide projects at their respective public libraries. The following quotations reflect some of their responses:

> **Responses to interview question**: **Are there any public libraries in your province that are involved with projects on bridging the digital divide?**
> - *I am not aware of any digital divide projects at our public libraries, if there are any, I would have seen on the municipal reports.*
> - *There are no digital divide projects reported in our public libraries.*
> - *We would have been notified if there were such projects; to my knowledge there is none.*
> - *Our public libraries are not involved in any digital divide projects.*

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**(e) Future plans to bridge the digital divide**

All participating provincial library services shared information on their future plans to bridge the digital divide. The essence of their future plans is presented in Table 5.9.

**Table 5.9: Future plans as reported by provincial library services**

| Provincial library services | Future plans |
|---|---|
| Free State | Maintenance of the ICT infrastructure in public libraries.<br>ICT training for the staff and community. |
| KwaZulu-Natal | Procurement of more computers and internet access points at public libraries affiliated to them and the maintenance of these. |
| Gauteng | Promotion of research in the electronic/digital world by staff members.<br>Information literacy programmes and ICT training to library users.<br>Introduction of an online public access system, which would link public libraries and schools and enable scholars to use the Online Access System(OPAC), which would allow them to view the contents of the public library system.<br>Completing the refurbishment of the Johannesburg library, making 140 computers available for public access to the internet using Wi-Fi technology. At the time of data collection the library was expected to be re-opening in March 2012. |
| North West | Continued roll-out of plans to provide computers and internet connections to public libraries.<br>Continuous collaboration with the National Library of South Africa on the provision of computers to public libraries.<br>ICT training of staff and community. |
| Western Cape | Connecting public libraries with the internet.<br>At the time of data collection about 106 libraries had been connected; it was planned to have 81 public libraries connected to the internet by the end of 2011. |
| Limpopo | Connecting more public libraries with the internet.<br>Purchasing more computers for distribution to public libraries, especially those situated in rural areas.<br>ICT training for staff and library users. |

**(f) Challenges affecting provincial and public libraries in bridging the digital divide**

The efforts of provincial and public libraries to bridge the digital divide are hampered by some challenges, as reflected in Table 5.10. Participants were allowed to choose more than one option and thus the last column does not add up to 100%.

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**Table 5.10: Challenges affecting provincial library services in bridging the digital divide**

| Challenges/barriers | Number (N=7) (2 did not participate) | Percentage |
|---|---|---|
| High cost of connectivity | 4 | 57 % |
| Security (There are many reported incidents of computer theft.) | 3 | 42% |
| Lack of training | 2 | 28% |
| Poor ICT infrastructure | 4 | 57% |
| Staff retention | 2 | 28% |
| Lack of funding | 4 | 57% |

The findings indicate that the high cost of connectivity, poor ICT infrastructure and lack of funding are the major challenges provincial library services experience in an effort to bridge the digital divide. Provincial library services reported that they did not receive any discount or rebate when paying for connectivity or purchasing ICT equipment. A few quotations are included here to reflect their responses:

**Responses to the interview question: What do you think are the challenges affecting provincial library services and public libraries in their efforts to bridge the digital divide?**

- *We are paying high cost of connectivity. Provincial libraries do not have any allowances or discount when they pay for connectivity. So we pay market-related prices.*
- *We are using inferior satellite connection for internet. We will prefer to use ADSL if there was enough funding.*
- *There is poor network connection: Unless we move from low cost satellite connections to fibre - there will always be connectivity problems. Our challenges are in big public libraries which are located at cities (metropolitan areas) as network is slow at these libraries due to high demand ...*
- *In some public libraries there are poor access points ... (poor electric*

> *connections do not always make to connect computers to power, especially at old buildings)*
>
> - *In our province there is really poor infrastructure, for example some areas do not have Telkom lines which make it difficult to connect our public libraries with internet even a mere telephone.*

The challenge of poor infrastructure is caused by lack of sufficient funding. This has a huge impact on provincial library services, as they are forced to use inferior or cheap ICT infrastructure. There is also concern regarding security of equipment such as computers and cables at public libraries. There is a high theft ratio of computers, according to the participants. This compels provincial library services to keep improving security to safeguard such equipment. Such activity again has huge financial implications for the provincial library services. The issue of theft at public libraries has far-reaching consequences in that some public libraries are beginning to be reluctant to house computers for fear of burglaries. This was elucidated by some participants:

> **Responses to the interview question: What do you think are the challenges affecting provincial library services and public libraries in their efforts to bridge the digital divide?**
>
> - *Due to theft and burglary, most of the libraries are not willing to have many computers at their premises.*
> - *There is theft in many public libraries. These libraries make efforts to install computers and the next day they are stolen. We are now compelled to spend more funds on improving security ...*

There are also challenges related to inability to retain qualified ICT staff. After receiving training to improve their skills, staff members often find better jobs and leave the public libraries.

**(g) Suggestions on strategies required to bridge the digital divide**

Participants were requested to offer suggestions on what they thought public libraries might require to contribute effectively to bridging the digital divide. Table 5.11 captures the suggestions supplied by participating provincial library services. The suggestions have been categorised with brief explanations and quotations to reflect the "voices" of the respondents.

**Table 5.11: Suggestions from participating provincial library services on strategies to bridge the digital divide**

| Issues | Brief explanations | Quotations |
|---|---|---|
| Acceptance of responsibility | Public libraries must accept the responsibility of providing access to digital information. | *Our public library should accept the responsibility of providing access to the digital information and accept the fact that we are moving to the electronic era.* |
| Change of mind set | Public librarians must change their mind set and view provision of internet access as a core function. | *Some libraries do not view the provision of the internet as a core function of the public library. This must change.* |
| Dedicated ICT programmes | There is a need to have a dedicated programme to provide ICT infrastructure to the community or public. | We need a programme that will focus on providing some sort of assistance to the community in terms of providing computers and the internet. |
| Development of university curricula addressing the digital divide | Library schools or Departments of Information Studies need to develop curricula to equip students to transfer ICT skills to the community via training and to address the digital divide. | *Our universities' library schools or departments should develop curricula to equip our students to transfer ICT skills to the community via training. This training should also focus on community development.* |
| Provision of access to the internet | Public libraries should ensure that they provide internet access to the public. | *Public libraries need to provide internet to the public and develop themselves as centres for information, whereby the public could get access to information.* |
| Integrated approach to bridging the digital divide | Various stakeholders, such as government departments, need to collaborate in their efforts to address the digital divide. | *There is a need for integrated approach in addressing the digital divide. At the moment as organisations we are working in silos. There is a need for collaboration between various departments e.g. Department of Basic Education and* |

| | | *provincial library services, as most of the learners are the dominant users of public libraries.* |
|---|---|---|
| Need for technical support | There is a general lack of ICT experts to provide technical support in many libraries. | *Libraries should have technical support that is needed. They need to identify ICT as priority in their planning. They should be ICT librarians, who will train own staff and users to make things easier. They also need technical knowledge in the use of ICTs, where they are experiencing challenges, they can use IT professionals.* |
| Development of internet policies | Public libraries should have internet policies to regulate internet use to address irregularities and abuse of internet usage. | *We must develop internet policies and procedures in our public libraries.* |
| Development of filters | Public libraries should filter some of the websites from their users. | *There is also a need to introduce control measures to filter the website access to prevent access to bad website e.g. gambling sites, pornographic sites, hacking sites etc.* |
| Attracting of funding | Public libraries should secure or lobby for more funding from the government and other organisations in the private sector. | *Libraries should get more money to be able to achieve all these plans. At least more funding from the government or elsewhere.* |

## (h) Other aspects

Participants were also requested to indicate other aspects they would like to bring to the attention of the researcher. The following were mentioned: partnerships between government and the private sector are vital, development of public libraries as one-stop-services, information literacy training, proper implementation of national strategy on ICT, and development of a monitoring mechanism, public awareness campaigns on the benefits of ICT and fewer restrictions by the government on what public libraries can do on the network.

After analysing the data collected through semi-structured interviews with directors of provincial library services, the data collected from public libraries in Gauteng, Limpopo and KwaZulu-Natal through the questionnaires were

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analysed. The data collected from public libraries are presented in the next section.

## 5.3. DATA FROM PUBLIC LIBRARIES IN LIMPOPO, KWAZULU-NATAL AND GAUTENG

As explained in Chapter 4 (section 4.6.3), the second group of participants in this study was public libraries in the following provinces in South Africa: Gauteng, Limpopo and KwaZulu-Natal. This section presents data collected from public libraries. The data were collected from these public libraries through a questionnaire (see Appendix B). The questionnaires were distributed to public libraries via their provincial library services. Public libraries were asked to fill in the questionnaire and submit it via email or fax machine to the researcher. As the questionnaires were sent out by the respective provincial library services, it is difficult to indicate exactly how many questionnaires were sent out. However, personnel from 247 public libraries completed and returned the questionnaire. The deadline was 30 October 2011. Despite being given an extension, some public libraries failed to meet the deadline for the return of the questionnaire.

This section presents the analysis of data collected from the questionnaire. General information is included to offer a profile of the participating public libraries. Data also include the statistical information of these public libraries, public library and internet access/provision, the public library and ways of addressing the digital divide, education and training, and their involvement with community services and future plans.

### 5.3.1. General information

Data presented in this section provide general information on public libraries that participated in the study. The general information is included to offer a brief profile of public libraries that participated in the study. The general information includes the provincial structure to which the public library reports. Table 5.12

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presents the number of libraries that could participate, the number of questionnaires returned and percentage response rate per province.

**Table 5.12: Public libraries that participated in the study**

| Provinces | No of libraries that could participate N= 463 | No of questionnaires returned N =247 | Percentage response rate per province |
|---|---|---|---|
| Gauteng | 234 | 130 | 55.55 |
| KwaZulu-Natal | 171 | 84 | 49.12 |
| Limpopo | 58 | 33 | 56.89 |

The next section will provide statistics provided by the respondents from participating public libraries in all three provinces.

### 5.3.2. Statistical information of participating public libraries

Participating public libraries were requested to provide statistical information. These statistics included the number of library staff, number of registered members, approximate number of visitors per day and approximate number of visitors per week.

### (a) Library statistics

The findings show that 246 out of 247 (99.60%) public libraries that participated in the survey indicated that they had statistical information available, with only one (0.4%) reporting that no statistical information was available.

Among public libraries indicating that they had statistical information, the response was as follows: 130/246 (52.84%) respondents were from participating libraries in Gauteng; 33/246 (13.41%) from Limpopo and 83/246 (33.73%) from KwaZulu-Natal. Only one of the 83 respondents from KwaZulu-Natal (1.19%) indicated that the public library did not have statistical information. No reason was given for this. The next subsection will provide statistical information on various issues listed below.

*(b) Number of library staff**

The total number of respondents to this question from participating public libraries in all three provinces was 247 (100%). The total number of staff in all public libraries in participating provinces was 1 557. Table 5.13 presents the number of staff members from participating public libraries per province. It shows that the total number of staff members in participating libraries in Gauteng province was 899, in KwaZulu-Natal it was 448 and in Limpopo it was 210.

**Table 5.13: Statistics on total number of library staff members in participating provinces**

| Provinces | Total number of staff members N=1 557 |
|---|---|
| Gauteng | 899 |
| KwaZulu-Natal | 448 |
| Limpopo | 210 |

**(c) Number of registered library members**

The number of respondents to this question from participating public libraries in all three provinces was 246. One respondent did not reply to this question. The total number of registered library members in public libraries in all participating provinces was 1 053 582. Table 5.14 indicates the number of library members of participating libraries per province. Gauteng had the largest number of registered library members, namely 608 671, while Limpopo province had the lowest number, namely 118 737.

**Table 5.14: Number of registered library members of participating public libraries per province**

| Provinces | Total number of library members N=1053 582 |
|---|---|
| Gauteng | 608 671 |
| KwaZulu-Natal | 326 174 |
| Limpopo | 118 737 |

**(d) Approximate number of visitors per day**

The total number of respondents to this question from participating public libraries in all three provinces was 226. Twenty-one respondents did not reply to this question. An approximate combined number of visitors per day to all participating libraries was 82 690.

The approximate combined number of visitors per day to public libraries in Gauteng was 46 270, in KwaZulu-Natal it was 27 011 and in Limpopo 9 409. The statistics on the approximate number of visitors per day are presented in Table 5.15 below.

**Table 5.15: Approximate number of visitors per day to participating public libraries per province**

| Provinces | Approximate number of visitors per day N=82 690 |
|---|---|
| Gauteng | 46 270 |
| KwaZulu-Natal | 27 011 |
| Limpopo | 9 409 |

**(e) Approximate number of visitors per week**

Table 5.16 presents data about the approximate number of visitors per week in participating public libraries. The total number of respondents to this question from participating public libraries in all three provinces was 227, while 20 respondents did not reply to it. The approximate number of visitors per week in public libraries in participating provinces was 514 412.

Gauteng had the largest approximate number of visitors per week to public libraries, namely 299 142, while KwaZulu-Natal had approximately 54 680 visitors per week. This was the lowest number in the three provinces.

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**Table 5.16: Approximate number of visitors per week to participating public libraries per province**

| Provinces | Approximate number of visitors per week N=514 412 |
|---|---|
| Gauteng | 299 142 |
| KwaZulu-Natal | 54 680 |
| Limpopo | 160 590 |

### 5.3.3. Public library and internet access/provision

The questionnaire requested public libraries to indicate the following: availability of a library website, number of computers for use by staff members and the public, number of computers connected to the internet, the duration for which public libraries had been providing internet access to library members and non-library members and charges for internet access.

### (a) Library website

The total number of respondents to the question in all three provinces was 243/247; four respondents did not reply to this question. Nearly all the respondents (238/243 - 97.94%) from participating public libraries in all three provinces reported that they did not have a website for their own library. Only 5/243 (2.06%) reported that they had a website for their own library.

Breaking the responses down by provinces, the number of respondents from participating public libraries in Gauteng was 130. Only five (3.85%) respondents reported that they had a website for their own library, while 125/130 (96.15%) reported that their libraries did not to have a website. The total number of respondents in KwaZulu-Natal was 82; only two respondents did not reply to this question. All 82 respondents (100%) reported that their libraries did not have a website. The total number of respondents from participating libraries in Limpopo was 31; only two respondents did not reply to this question. All 31 respondents (100%) reported that their libraries did not have a website.

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## (b) Number of computers for use by staff and the public

The questionnaire requested public libraries to indicate the number of computers available for use by staff members and the public.

### (i) Staff

The total number of respondents to this question from participating public libraries in all three provinces was 247. The responses per province were as follows: The total number of respondents to this question in Gauteng was 130. Gauteng had 891 computers for use by staff members. This was the largest number compared to the other two provinces. The total number of respondents to this question in KwaZulu-Natal was 84 and the province had 435 computers for use by staff. The total number of respondents to this question in Limpopo was 33. Limpopo had 200 computers for use by staff. This was the lowest number compared to the other two provinces. This is reflected in Table 5.17.

**Table 5.17: Number of computers for use by staff and members in participating libraries in all three provinces**

| Provinces | Number of computers for use by staff N=247 | Number of computers for use by members N=240 |
|---|---|---|
| Gauteng | 891 | 1 478 |
| KwaZulu-Natal | 435 | 859 |
| Limpopo | 200 | 227 |

### (ii) Public

The total number of respondents to this question from participating libraries in all three provinces was 240; seven respondents did not reply to this question. The responses per province were as follows: The total number of respondents to this question from participating libraries in Gauteng was 128; only two respondents did to reply to this question. Gauteng had 1 478 computers for use by the public in public libraries. The total number of respondents to this question from participating libraries in KwaZulu-Natal province was 80; four respondents did not reply to this question. The number of computers for use by the public in public

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libraries in KwaZulu-Natal province was 859. The total number of respondents to this question from participating libraries in Limpopo province was 32; only one respondent did not reply to this question. The number of computers for use by the public in public libraries in Limpopo province was 227. This is shown in Table 5.17.

**(c) Number of computers connected to the internet**

Public libraries were also requested to indicate the number of computers connected to the internet. The total number of respondents from participating public libraries in all three provinces was 247.

The responses per province were as follows: In Gauteng, 130 respondents reported that 2 317 computers were connected to the internet in public libraries in the province. There were 84 respondents from public libraries in KwaZulu-Natal who reported that 1 260 computers were connected to the internet in public libraries in the province. In Limpopo 33 respondents reported that 402 computers were connected to the internet in public libraries in the province. This is presented in Table 5.18.

**Table 5.18: Number of computers connected to the internet per province**

| Provinces | Number of respondents N=247 | Number of computers connected to the internet |
|---|---|---|
| Gauteng | 130 | 2 317 |
| KwaZulu-Natal | 84 | 1 260 |
| Limpopo | 33 | 402 |

**(d) Period for which the public library had been providing internet access**

The questionnaire required public libraries to indicate the period for which they had been providing internet access to (i) staff, (ii) members, and (iii) non-members.

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### (i)   Staff members

The total number of respondents to this question from participating libraries in all three provinces was 243; four respondents did not reply to this question. Only 1/243 respondent (0.41%) reported that the library had been providing internet access for less than a year, while 13/243 (5.35%) reported that their libraries had been providing internet access for between one and two years. Another 68/243 (27.98%) reported that their libraries had been providing internet access for between three and years and 161/243 (66.26%) reported that their libraries had been providing internet access for more than four years. This is reflected in Table 5.19.

**Table 5.19: Period for which staff had access to the internet in all provinces**

| Period | Frequency N=243 | Percentage |
|--------|-----------------|------------|
| <1 year | 1 | 0.41 |
| 1 – 2 years | 13 | 5.35 |
| 3 – 4 years | 68 | 27.98 |
| >4 years | 161 | 66.26 |
| **Total** | **243** | **100** |

This paragraph reports on the period for which staff members had had internet access per province. In Gauteng there were 127 respondents to this question; three respondents did not reply to it. Only one respondent (0.78%) reported that the library had been providing internet access to staff members for less than one year; 9/127 (7.09%) reported that their libraries had been providing internet access to their staff members for a period of one to two years, 35/127 (27.56%) reported that their libraries had been providing internet access to their staff members for a period of three to four years and 82/127 (64.57%) reported that they had been providing this access for more than four years. This is shown in Table 5.20.

**Table 5.20: Period for which staff had access to the internet in Gauteng**

| Period | Frequency N=127 | Percent |
|---|---|---|
| <1 year | 1 | 0.78 |
| 1 – 2 years | 9 | 7.09 |
| 3 – 4 years | 35 | 27.56 |
| >4 years | 82 | 64.57 |
| **Total** | **127** | **100** |

Table 5.21 reflects the period for which staff members had access to the internet in KwaZulu-Natal. The total number of respondents to the question from participating libraries in KwaZulu-Natal province was 83; only one respondent did not reply to this question. Three of the 83 (3.61%) respondents reported that their libraries had been providing internet access to their staff members for a period of between one and two years, 27/83 (32.53%) reported that their libraries had been providing this access for between three and four years and 53/83 (63.86%) reported that their libraries had been providing internet access to their staff members for more than four years.

**Table 5.21: Period for which staff members had access to the internet in KwaZulu-Natal**

| Period | Frequency N=83 | Percent |
|---|---|---|
| 1-2 years | 3 | 3.61 |
| 3-4 years | 27 | 32.53 |
| >4 years | 53 | 63.86 |
| **Total** | **83** | **100** |

The period for which staff members from public libraries in Limpopo had access to the internet is reflected in Table 5.22. There were 33 respondents to this question from Limpopo, of which only one respondent (3.03%) reported that the library had been providing internet access to staff members for between one and two years, 6/33 (18.18%) reported that their libraries had been providing internet access to their staff members for between three and four years and 26/33

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(78.79%) reported that their public libraries had been providing this access for more than four years.

**Table 5.22: Period for which staff members had access to the internet in Limpopo**

| Period | Frequency N=33 | Percent |
|--------|----------------|---------|
| 1-2 years | 1 | 3.03 |
| 3-4 years | 6 | 18.18 |
| >4 years | 26 | 78.79 |
| **Total** | **33** | **100** |

### (ii)    Members

The total number of respondents from participating libraries from all three provinces was 241; only six respondents did not reply to this question. Six of the 241 (2.49%) respondents reported that their libraries had been providing internet access to their members for less than one year, 34/241 (14.11%) reported that their libraries had been providing such access for between one and two years, 83/241 (34.44%) reported that they had been providing it for between three and four years and 118/241 (48.96%) reported that they had been providing it for more than four years. This is shown in Table 5.23.

**Table 5.23: Period for which library members had internet access in all three provinces**

| Period | Frequency N=241 | Percent |
|--------|-----------------|---------|
| <1 year | 6 | 2.49 |
| 1 – 2 years | 34 | 14.11 |
| 3 – 4 years | 83 | 34.44 |
| >4 years | 118 | 48.96 |
| **Total** | **241** | **100** |

The next section will provide a report from each of the participating provinces. The total number of respondents to this question from participating public libraries in Gauteng province was 127, while three respondents did not reply to

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this question. Only 2/127 (1.58%) respondents reported that their libraries had been providing internet access to members for less than one year, 18/127 (14.17%) reported that their libraries had been providing internet access to members for between one and two years, 37/127 (29.13%) reported that their libraries had been providing such access for between three and four years and 70/127 (55.12%) reported that their libraries had been providing it for more than four years. This is reflected in Table 5.24.

**Table 5.24: Period for which library members had access to the internet in Gauteng**

| Period | Frequency N=127 | Percent |
|--------|-----------------|---------|
| <1 year | 2 | 1.58 |
| 1-2 years | 18 | 14.17 |
| 3-4 years | 37 | 29.13 |
| >4 years | 70 | 55.12 |
| **Total** | **127** | **100** |

Table 5.25 reflects the period for which library members had access to the internet in KwaZulu-Natal. Eighty-two participating public libraries in KwaZulu-Natal responded to this question, while two did not. Two of the 82 (2.43%) respondents reported that their libraries had been providing internet access to members for less than one year, 10/82 (12.20%) reported that their libraries had been providing such access for between one and two years, 30/82 (36.59%) reported that their libraries had been providing internet access for between three and four years and 40/82 (48.78%) reported that their libraries had been providing it for more than four years.

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**Table 5.25: Period for which library members had access to the internet in KwaZulu-Natal**

| Period | Frequency N=82 | Percent |
|--------|--------|---------|
| <1 year | 2 | 2.43 |
| 1-2 years | 10 | 12.20 |
| 3-4 years | 30 | 36.59 |
| >4 years | 40 | 48.78 |
| **Total** | **82** | **100** |

The total number of respondents to this question from participating libraries in Limpopo was 32; only one respondent did not reply to it. Only 2/32 (6.25%) respondents reported that their libraries had been providing internet access to members for less than one year, 6/32 (18.75%) reported that their libraries had been providing internet access for between one and two years, 16/32 (50%) reported that their libraries had been providing such access to members for between three and four years and 8/32 (25%) reported that their libraries had been providing it to members for more than four years. This is shown in Table 5.26.

**Table 5.26: Period for which library members had access to the internet in Limpopo**

| Period | Frequency N=32 | Percent |
|--------|--------|---------|
| <1 year | 2 | 6.25 |
| 1-2 years | 6 | 18.75 |
| 3-4 years | 16 | 50.00 |
| >4 years | 8 | 25.00 |
| **Total** | **32** | **100** |

### (iii) Non-members

The total number of respondents to this question from participating libraries in all three provinces was 202; 45 respondents did not reply to this question. Among those who responded, 15/202 (7.42%) reported that they had been providing internet access to non-members for less than one year, 43/202 (21.29%)

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reported that they had been providing internet access to non-members for between one and two years, 73/202 (36.14%) reported that they had been providing such access for between three and four years and 71/202 (35.15%) reported that they had been providing it for more than four years. This is reflected in Table 5.27.

**Table 5.27: Period for which non-members from participating public libraries from all three provinces had internet access**

| Period | Frequency N=202 | Percent |
|---|---|---|
| <1 year | 15 | 7.42 |
| 1 – 2 years | 43 | 21.29 |
| 3 – 4 years | 73 | 36.14 |
| >4 years | 71 | 35.15 |
| **Total** | **202** | **100** |

The next section will break down the response according to the three participating provinces.

The total number of respondents to this question from participating public libraries in Gauteng was 109; 21 respondents did not reply to this question. Among those who replied, 9/109 (8.25%) reported that they had been providing internet access to non-members for less than a year, 25/109 (22.94%) reported that they had been providing such access for between one and two years, 33/109 (30.28%) reported that they had been providing it for between three and four years and 42/109 (38.53%) reported that they had been providing it for more than four years. This is shown in Table 5.28.

**Table 5.28: Period for which non-members from participating public libraries in Gauteng had access to the internet**

| Period | Frequency N=109 | Percent |
|--------|------------------|---------|
| <1 year | 9 | 8.25 |
| 1-2 years | 25 | 22.94 |
| 3-4 years | 33 | 30.28 |
| 4 years | 42 | 38.53 |
| **Total** | **109** | **100** |

The total number of respondents to this question from participating public libraries in KwaZulu-Natal province was 68; 16 respondents did not reply to this question. Three of the 68 (4.41%) respondents who replied to this question reported that they had been providing internet access to non-members for less than a year, 9/68 (13.24%) reported that they had been providing such access for between one and two years, 32/68 (47.06%) reported that they had been providing it for between three and four years and 24/68 (35.29%) reported that they had been providing it for more than four years. This is reflected in Table 5.29.

**Table 5.29: Period for which non-members from participating public libraries in KwaZulu-Natal had access to the internet**

| Period | Frequency N=68 | Percent |
|--------|-----------------|---------|
| <1 year | 3 | 4.41 |
| 1-2 years | 9 | 13.24 |
| 3-4 years | 32 | 47.06 |
| 4 years | 24 | 35.29 |
| **Total** | **68** | **100** |

The total number of respondents to this question from participating libraries in Limpopo province was 25; eight respondents did not reply to this question. Three of the 25 who responded (12%) reported that they had been providing internet access to non-members for less than a year, 9/25 (36%) reported that they had been providing such access for between one and two years, 8/25 (32%) reported

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that they had been providing it for between three and four years and 5/25 (20%) reported that they had been providing it for more than four years. This is shown in Table 5.30.

**Table 5.30: Period for which non-members from participating public libraries in Limpopo had access to the internet**

| Period | Frequency N=25 | Percent |
|---|---|---|
| <1 year | 3 | 12.00 |
| 1-2 years | 9 | 36.00 |
| 3-4 years | 8 | 32.00 |
| 4 years | 5 | 20.00 |
| **Total** | **25** | **100** |

**(e) Cost of internet access**

The researcher asked respondents to indicate whether their libraries charged for internet access. The total number of respondents to this question from participating libraries in the three provinces was 247. The results indicate that 56/247 (22.67%) respondents charged for internet access and 191/247 (77.33%) indicated that they did not charge for it.

The next section will break down the response according to provinces. Data are presented in two tables. As presented in Table 5.31, 27/56 (48.21%) participating public libraries from Gauteng indicated that they charged for internet access. Nineteen of the 56 participating public libraries in KwaZulu-Natal (33.92%) indicated that they charged for internet access and 10/56 (17.85%) participating libraries from Limpopo indicated that they charged for internet access.

**Table 5.31: Public libraries that charge and those that do not charge for internet use in the three participating provinces**

| Provinces | Number of public libraries responding to the question N=247 | Number of public libraries that charge for internet access | Number of public libraries that do not charge for internet access |
|---|---|---|---|
| Gauteng | 130 | 27 | 103 |
| KwaZulu-Natal | 84 | 19 | 65 |
| Limpopo | 33 | 10 | 23 |
| **Total** | **247** | **56** | **191** |

The number of public libraries that indicated that they did not charge for internet use is reflected in Table 5.31. A hundred and three out of 191 participating libraries from Gauteng (53.92%) indicated that they did not charge for internet access. Sixty-five out of 191 participating public libraries from KwaZulu-Natal (34.03%) indicated that they did not charge for internet access and 23/191 (12.04%) participating public libraries from Limpopo also indicated that they did not charge for internet access.

The cost of internet access varied, with some public libraries indicating that they charged fixed rates while others charged flexible rates. Some charged R10 for 30 minutes, some R8 for 30 minutes and some R5 for 30 minutes.

### 5.3.4. Opinions and perceptions on the concept of digital divide

This section will cover the opinions and perceptions of respondents from participating public libraries on the concept of the digital divide. It will also present the findings on the following issues: the availability of policies on bridging the digital divide, initiatives to bridge the digital divide, role public libraries should play in bridging the digital divide, suggestions from participating libraries on initiatives libraries can take to bridge the digital divide and factors affecting a library's ability to play a role in addressing the digital divide.

**(a) Personal opinion on the digital divide**

Participants were requested to give their personal opinion on the digital divide. The total number of respondents from participating public libraries to this question was 240; only seven respondents did not reply to this question. A significant number of respondents, 174/240 (72.5%), did not understand what the digital divide was all about. This made it difficult for them to give their opinion on the digital divide. When trying to categorise their responses, the researcher had the sense that there was lack of understanding of what the digital divide is, that respondents actually viewed the digital divide as a tool, and that they regarded the digital divide as significant, without elaborating on their answers.

When analysing the responses, particular issues were notable. These issues are captured in the first column of Table 5.32. More detailed responses are captured in the second column of the same table.

**Table 5.32: Issues and examples of responses of participating libraries in all three provinces**

| Issues | Responses |
|---|---|
| Gap | - *There are a big divide between the richer and the poorer.*<br>- *Digital divide exist between people in the rural areas and people in the cities. Also between educated and uneducated.*<br>- *It's about the gap between those who have the skills, knowledge and abilities to use the technologies and those who do not.*<br>- *We heard that it is a gap between people who have and don't have technology, and that it affects the whole world, in some places more than others.* |
| Access | - *I think it refers to any inequalities between groups, in terms of access to, use of, or knowledge of modern technologies.*<br>- *It is important to bridge the digital divide so that people who lack access to information can gain it and overcome not only this problem, but many other.*<br>- *If there is lack of access to this technology, other people will have less education and less opportunities than those who have access to technology. It is very unfair.*<br>- *People should have access to technology because technology give access to education and by giving technology to people you are giving them a way to educate themselves. Therefore you are giving them an* |

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| | |
|---|---|
| | *opportunity to improve their quality of life. We must address the digital divide urgently.* |
| ICTs (such as computers and internet) | - *People from rural background are mainly the ones who need training on computers and also have difficulties on accessing digital information (NB: The response can also fit under the category: Access).*<br><br>- *It is about the difference between people who have access to and the resources to use new information and communication tools, such as the internet, and people who do not have the resources and access to the technology.*<br><br>- *The digital divide is a very concerning issue because it is unfair that some people and some countries have less access to technologies such as computers, internet, and the information brought along with them than those who have more money and countries already developed.*<br><br>- *These people on the "more technology" side of the digital divide are lucky because they can have access to knowledge to improve the quality of their lives* |
| Ability to use | - *The digital divide means unequal material, usage, skills, benefit and access to information and communication technologies. I am of the opinion that we should strive by all means possible to narrow and bridge this divide. (NB: This response can also fit under categories such as Access and ICTS).*<br><br>- *I think the digital divide may be caused by some people who may not have technology because they think it is irrelevant to their schedule or job, it may not be available to purchase, or they may not know how to use it!*<br><br>- *The problem is that due to high rate of illiteracy, some people cannot use these technologies and therefore they are affected by the digital divide.* |

The following are responses that indicate lack of understanding of the concept of the digital divide:

**Selected responses to the survey question: What is your personal opinion on the digital divide?**

- *Perhaps I first need to understand what this means ... the digital divide.*
- *I would like to know what digital divide means.*
- *I haven't got an idea what it is all about!  What is digital divide?*
- *I am not sure if I understand what the digital divide means ...*

> - *I reckon this divide has to do with how we render our library services.*
> - *This is a strange concept; it has to deal with people …*
> - *My opinion is that it should not be used to solve the problems at our libraries ...*

### (b) Policy on bridging the digital divide

The questionnaire requested public libraries to indicate if they had a policy on bridging the digital divide.

The total number of respondents to this question from participating public libraries in all three provinces was 239; eight respondents did not reply to this question. A total number of 236/239 (98.74%) respondents from participating public libraries in all three provinces reported that they did not have a formal (written) policy on bridging the digital divide. Only 3/239 (1.26%) respondents from participating public libraries in all three provinces reported that they did have a policy on bridging the digital divide.

If one breaks down the responses per province, the results are as follows: The number of respondents to this question from participating public libraries in Gauteng was 124; only six respondents did not reply to this question. Of those who responded, only one (0.81%) reported having a policy on bridging the digital divide; 123/124 (99.19%) respondents reported that they did not have a policy on bridging the digital divide.

Eighty-two respondents from participating public libraries in KwaZulu-Natal replied to this question; only two did not reply. Of those who responded, one respondent (1.22%) reported that the library had a policy on bridging the digital divide; 81/82 (98.78%) reported that they did not have such a policy.

The total number of respondents to this question from participating public libraries in Limpopo province was 33. Only one respondent (3.03%) reported that

the library had a policy on addressing the digital divide; 32/33 (96.97%) reported that they did not have such a policy.

The questionnaire further asked them to elaborate if they had answered affirmatively. The reports on policies on bridging the digital divide addressed a number of issues, including training on how to use the internet (three libraries); quality access (improvement of broadband access and services in rural areas - two libraries); libraries' commitment to providing internet access and access to technology to users (three libraries).

Public libraries that indicated that they had a policy on bridging the digital divide further elaborated that they ensured that individuals who used the library had access to all resources being provided by the library and made sure that they could make technological resources available to all library users regardless of their location.

Another view with regard to policies was that the aim was to bring technology to the people, to educate people and to give them knowledge. Some public libraries indicated that their policy aimed to support the processes to provide their communities with free internet facilities by means of internet kiosks.

Lack of policies to address the digital divide was a real concern. It seemed as if libraries regarded the development and implementation of policies to deal with the digital divide as the responsibility of the government. Earlier in section 5.2, reporting on interviews with representatives of provincial library services, it was suggested that there should be a discount for libraries on internet connection fees and purchasing of computers.

**(c) Initiatives to bridge the digital divide**
The questionnaire asked the staff of public libraries to indicate any initiatives to bridge the digital divide. The total number of respondents to this question from

participating public libraries in all three provinces was 245; only two respondents did not reply to this question. Sixty-one of the 245 respondents (24.90%) reported that they did have initiatives at their libraries to bridge the digital divide; 184/245 (75.10%) reported that they did not have any initiatives at their libraries to bridge the digital divide.

The initiatives per province are reported in Figure 5.2.The number of respondents from participating public libraries in Gauteng was 129; one respondent did not reply to this question. Twenty of the 129 respondents (15.50%) reported that there were initiatives at their libraries to bridge the digital divide; 109/129 (84.50%) reported that there were no such initiatives at their libraries.

The number of respondents to this question from participating libraries in KwaZulu-Natal province was 83; one respondent did not reply to this question. Thirty-seven of the 83 (44.58%) respondents reported that their libraries had launched initiatives to bridge the digital divide; 46/83 (55.42%) reported that there were no initiatives at their libraries to bridge the digital divide.

The total number of respondents to this question from participating public libraries in Limpopo province was 33. Only 4/33 (12.12%) respondents reported that there were initiatives at their libraries to bridge the digital divide; 29/33 (87.88%) reported that there were no initiatives by their libraries to do this.

**Figure 5.2: Percentage of public libraries with initiatives to bridge the digital divide per province**
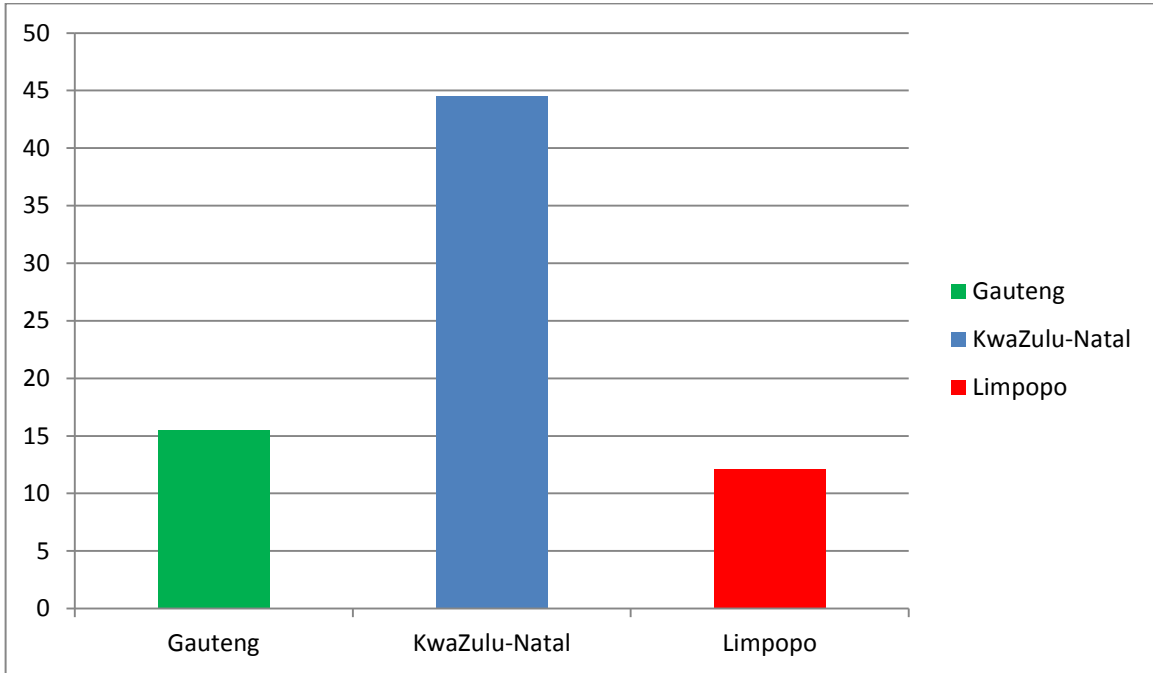


Table 5.33 presents a categorisation of initiatives as reported by participating public libraries in all three provinces.

**Table 5.33: Categorised initiatives as reported by participating public libraries in all three provinces**

| Category | Initiatives |
|---|---|
| Provision of internet access | - Working with the provincial library services to provide internet access<br>- Providing internet access free of charge to poor communities<br>- Improving internet connections<br>- Connecting libraries with the internet<br>- Implementing wireless technology |
| Outreach services | - Providing mobile library services to people who are unable to visit the library<br>- Working with schools and other agencies to bring technology to the people (community)<br>- Creating public awareness of capabilities and opportunities of ICTs |
| Training | - Training of people on how to use computers, the internet and other technologies involved<br>- Providing free weekly basic computer classes<br>- Provision of information literacy classes<br>- Developing training programmes in ICTs |
| Information access | - Provision of information resources<br>- Enabling access to information through ICTs |
| ICT resources | - Improving ICT infrastructure to ensure public access<br>- Purchasing more computers for users<br>- Securing funding to implement other ICT projects (installing fibre-optic cable)<br>- Creating more access network points at libraries |

## (d) Role public libraries should play in bridging the digital divide

The questionnaire requested public libraries to indicate the role they could play in bridging the digital divide. In total 223/247 (90.28%) of respondents listed roles they thought their libraries should play. Table 5.34 presents the roles public libraries could play in bridging the digital divide, as reported by participating libraries. The roles are categorised based on the literature review in Chapter 3 on the role libraries should play in addressing the digital divide.

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**Table 5.34: Categorised roles the public library should play in bridging the digital divide, as reported by participating libraries**

| Category | Roles as noted by participating public libraries |
|---|---|
| Providing access | - Providing users with a tool to enable them to use the internet<br>- Providing free internet access to the community<br>- Providing access to computers and the internet<br>- Providing access for computer users to be able to access the library. |
| Developing outreach programmes | - Providing mobile library services to those who cannot reach services such as the internet<br>- Reaching out to disadvantaged people who lack access and skills. |
| Information exchange and communication between citizens and government | - Provision of government information in an electronic format. |
| Providing information literacy and technology literacy programmes | - Providing computer literacy skills for those who need them (basic computer skills), because there are so many users/non-users who want to make use of the ICT facility, but do not know how to use the tools<br>- Providing basic library training; providing free training to users; providing continuous training<br>- Offering library instruction to users<br>- Providing internet, computer and various other technology classes<br>- Providing an effective environment for basic internet and computer training skills<br>- Providing ICT literacy programmes<br>- Providing free computer classes to the community. |
| Information provision | - Making digital resources available to the users<br>- Playing a role as information providers by using their advanced technological tools to provide information<br>- Responding to reference queries from users<br>- Provision of WEB 2.0 technologies (this will enable users to use blogs, upload photos and videos and to use other social network media). |

**(e) Suggestions from participating libraries on initiatives libraries can take to bridge the digital divide**

The questionnaire requested public libraries to indicate initiatives they could undertake to bridge the digital divide. A total number of 178/247 (71.06%) respondents made suggestions about initiatives. Table 5.35 presents their suggestions.

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**Table 5.35: Categorised suggestions from participating libraries on initiatives to bridge the digital divide**

| Category | Suggestions on initiatives |
|---|---|
| Training | - Provision of computer literacy training<br>- Continuous training on new technologies<br>- Providing staff with ICT skills training to enable them to play a role<br>- Training as many users as possible to transfer skills and empower them. |
| Access | - Provision of computers<br>- Provision of internet. |
| Digital library developments | - Developing subject databases, digital reference services, free access to e-journals and e-books in many areas, electronic archives and free digital libraries. This should to some extent help to bridge the digital divide. |
| Development of policies on digital divide | - Developing policies that support efforts to address the digital divide, such as discounts on computer purchases and internet connections for libraries. |
| Soliciting funding | - Appealing to the community and businesses to donate computers to schools in rural areas<br>- Submitting funding proposals to funding agencies to acquire ICT infrastructures for libraries<br>- Approaching foundations such as the Bill Gates and Carnegie Foundations to provide funding<br>- Requesting additional funding from government (local municipalities) to acquire additional computers and other ICT resources. |
| Developing consortiums | - Libraries need to group themselves especially when purchasing expensive ICT infrastructure or subscribing to expensive electronic resources. This might result in cost savings. |
| Physical space | - Some libraries are too small to accommodate users and ICT resources, thus libraries should find ways to expand to accommodate such needs.<br>- Develop community technology centres that deal with computer and internet access in the library, e.g. kiosks. |

## (f) Factors affecting libraries' ability to play a role in addressing the digital divide

Efforts by public libraries to bridge the digital divide in South Africa are hampered by a number of factors. The questionnaire requested public libraries to indicate factors affecting their library's ability to play a role in addressing the digital divide. The number of respondents to this question from participating public libraries in all three provinces was 231; 16 respondents did not reply to this question. The responses per province were as follows: the total number of respondents to this

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question from participating libraries in Gauteng was 120/130 (92.30%); only 10/130 (7.69%) respondents did not reply to this question. The total number of respondents from KwaZulu-Natal was 78/84 (92.85%); only 6/84 (7.14%) respondents did not reply to this question. The number of respondents in Limpopo was 33/33 (100%). This is reflected in Figure 5.3.

**Figure 5.3: Percentage of respondents from participating libraries in all three provinces who responded to the question on the factors affecting libraries in addressing the digital divide**
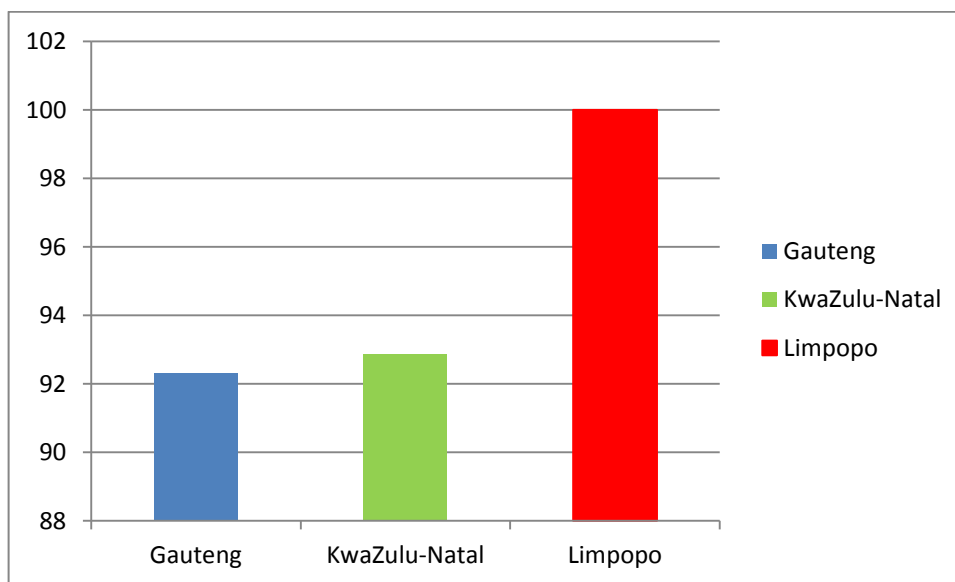


The responses show that lack of funds was selected by 147/231 (63.63%) as an important factor hampering public libraries that wish to play a role in addressing the digital divide. Inadequate physical space 135/231 (58.44%) and lack of strategies to address the digital divide 124/231 (53.67%) were also reported as hampering factors in this regard. Table 5.36 presents all factors affecting public libraries as reported by public libraries in all three participating provinces.

**Table 5.36: Factors affecting public libraries according to respondents from all three provinces**

| Province | Factors | Number of responses to the question | Percentage of responses |
|---|---|---|---|
| Gauteng (N=120) | Lack of funds | 74 | 61.66 |
| | Lack of strategies to address the digital divide | 68 | 56.66 |
| | Inadequate physical space | 68 | 56.66 |
| | Staff shortage | 36 | 30 |
| | Lack of ICT strategies | 34 | 28.33 |
| | Lack of government support | 30 | 25 |
| | Lack of ICT resources | 26 | 21.66 |
| | Lack of staff training | 26 | 21.66 |
| KwaZulu-Natal (N=78) | Inadequate physical space | 51 | 65.38 |
| | Lack of funds | 46 | 58.97 |
| | Lack of strategies to address the digital divide | 45 | 57.69 |
| | Lack of ICT resources | 26 | 33.33 |
| | Lack of ICT strategies | 25 | 32.05 |
| | Lack of government support | 23 | 29.48 |
| | Staff shortage | 23 | 29.48 |
| | Lack of staff training | 20 | 25.64 |
| Limpopo (N=33) | Lack of funds | 27 | 81.81 |
| | Inadequate physical space | 16 | 48.48 |
| | Lack of ICT resources | 13 | 39.39 |
| | Lack of ICT strategies | 11 | 33.33 |
| | Lack of strategies in addressing the digital divide | 11 | 33.33 |
| | Staff shortage | 11 | 33.33 |
| | Lack of government support | 8 | 24.24 |
| | Lack of staff training | 8 | 24.24 |

## 5.3.5. Education and training offered by public libraries to staff, members and non-members

This section will provide responses regarding the type of training offered by public libraries. Specific attention will be paid to the content of such training and the type of training offered by public libraries.

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**(a) Library training**

The questionnaire requested public libraries to indicate whether they provided training to (i) staff, (ii) members, and (iii) non-members.

*(i)       Staff*

The number of respondents to this question from participating libraries in the three provinces was 174; 73 respondents gave no reply. The results indicates that 140/174 (80.46%) of the respondents reported that they provided training to their staff members. Thirty-four out of 174 (19.54%) respondents reported that they did not provide training to their staff members.

Table 5.37 indicates that out of 140 public libraries that indicated that they provided training to their staff members, 68 (48.57%) were from Gauteng, 14 (10%) from Limpopo and 58/140 (41.42%) from KwaZulu-Natal.

**Table 5.37: Public libraries that provided training to staff members per province**

| Provinces | Number of respondents from participating libraries N=140 | Percent |
|---|---|---|
| Gauteng | 68 | 48.57 |
| Limpopo | 14 | 10 |
| KwaZulu-Natal | 58 | 41.43 |
| **Total** | **140** | **100** |

*(ii)      Members*

The number of respondents to this question from all three participating provinces was 211; 36 respondents gave no reply. The results indicate that nearly all respondents from participating public libraries (198/211; 93.84%) reported that they provided training to their members, with 13/211 (6.16%) public libraries indicating that they did not provide training to their members.

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Table 5.38 indicates that of the 198 public libraries that indicated that they provided training to their members, 108 (54.54%) were from Gauteng, 19 (9.60%) from Limpopo and 71 (35.85%) from KwaZulu-Natal.

**Table 5.38: Public libraries that provided training to their members and those that did not per province**

| Provinces | Public libraries that provide training (Frequency N=198) | Percentage | Public libraries that do not provide training (Frequency N= 13) | Percentage |
|---|---|---|---|---|
| Gauteng | 108 | 54.55 | 5 | 38.46 |
| KwaZulu-Natal | 71 | 35.85 | 3 | 23.07 |
| Limpopo | 19 | 9.60 | 5 | 38.46 |
| Total | **198** | **100** | 13 | 100 |

### (iii) Non-members

The number of respondents to this question from participating libraries in all three provinces was 206; 41 respondents did not reply to this question. The results indicate that 31/206 (15.05%) of the respondents reported that they provided training to non-members and 175/206 (84.95%) reported that they did not.

Of the 31/206 (15.05%) respondents from participating public libraries that indicated that they provided training to non-members, 10 (32.25%) respondents were from Gauteng, five (16.12%) from Limpopo and 16 (51.61%) from KwaZulu-Natal. This is shown in Table 5.39.

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**Table 5.39: Public libraries that provided training to non-members and those that did not per province**

| Provinces | Public libraries that provide training (Frequency N=31) | Percentage | Public libraries that do not provide training Frequency N=175 | Percentage |
|-----------|---------|------------|---------|------------|
| Gauteng | 10 | 32.25 | 98 | 56 |
| KwaZulu-Natal | 16 | 51.62 | 59 | 10.28 |
| Limpopo | 5 | 16.13 | 18 | 33.72 |
| **Total** | **31** | 100 | **175** | **100** |

### (b) Content of training

Public libraries were requested to indicate the content of training their libraries offered to their staff, members and non-members. The number of respondents from participating libraries in all three provinces was 243; only four respondents did not reply to this question.

Table 5.40 indicates that most public libraries focused on general computer software use (82/243 - 33.74%), general computer skills (83/243 - 34.1%), and general internet use (78/243 - 32.09%). Participants could select more than one option.

**Table 5.40: Content of the training the library offered in all three provinces**

| Content of the training | Number of times the item was selected N=243 | Percentage of responses |
|-----------|---------|------------|
| General internet use | 78 | 32.09 |
| General computer skills | 83 | 34.15 |
| General computer software use | 82 | 33.74 |

The next section will break down the responses per province:

Out of 243 respondents, 129 were from participating libraries in Gauteng. Only one respondent from Gauteng did not reply to this question. The responses indicated that public libraries in Gauteng focused on general computer skills

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(44/129 - 34.10%), general computer software use (43/129 - 33.33%) and general internet use (42/129 - 32.55%). This is reflected in Table 5:41.

**Table 5:41: Content of the training the library offered in Gauteng**

| Content of the training | Number of times the item was selected N=129 | Percentage of responses |
|---|---|---|
| General computer skills | 44 | 34.10 |
| General computer software use | 43 | 33.33 |
| General internet use | 42 | 32.55 |

Out of 243 respondents, 84 respondents were from participating libraries in KwaZulu-Natal. The responses indicated that public libraries in KwaZulu-Natal focused on general computer software use (29/84 - 34.52%), general computer skills (28/84 - 33.33%) and general internet use (27/84 - 32.14%). This is reflected in Table 5.42.

**Table 5.42: Content of training the library offered in KwaZulu-Natal**

| Content of the training | Number of times the item was selected N=84 | Percentage of responses |
|---|---|---|
| General computer skills | 28 | 33.33 |
| General computer software use | 29 | 34.52 |
| General internet use | 27 | 32.14 |

Out of 243 respondents, 30 respondents were from participating libraries in Limpopo; only three respondents did not reply to this question. The responses also show that public libraries in Limpopo focus on general computer skills (11/30 - 36.66%), general computer software use (10/30 - 33.33%) and general internet use (9/30 - 30%). This is presented in table 5.43.

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**Table 5.43: Content of the training that the library offered in Limpopo**

| Content of the training | Number of times the item was selected N=30 | Percentage of responses |
|---|---|---|
| General computer skills | 11 | 36.66 |
| General computer software use | 10 | 33.33 |
| General internet use | 9 | 30 |

### (c)Type of training

Public libraries were further requested to indicate the type of training they offered to their staff, members and non-members.

The number of respondents to this question from participating libraries in all three provinces was 231; 16 respondents did not reply to this question.

Table 5.44 shows that informal assistance (83/232 - 35.93%) recorded the highest response as the type of training provided by public libraries; formal training classes (76/231 - 32.90%) and one-on-one training sessions (72/231 - 31.16%) recorded the highest response rates respectively as type of training offered by participating libraries in all three provinces.

**Table 5.44: Types of training offered by participating libraries in all three provinces**

| Types of training | Number of times the item was selected N=231 | Percentage of responses |
|---|---|---|
| Informal assistance | 83 | 35.93 |
| Formal training classes | 76 | 32.90 |
| One-on-one training | 72 | 31.16 |

The next section will break down responses per province.

The number of responses to this question from participating libraries in Gauteng was 122; only eight respondents did not reply to this question. The responses

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indicated that informal assistance (45/122 - 36.88%), formal training classes (42/122 - 34.42%) and one-on-one training sessions (36/122 - 29.50%) elicited the highest response rates respectively as type of training offered by participating libraries in Gauteng.

The number of responses to this question from participating libraries in KwaZulu-Natal was 77; only seven respondents did not reply to this question. The responses indicated that informal assistance (28/77 - 36.36%), one-on-one training sessions (27/77 - 33.76%) and formal training classes (23/77 - 29.87%) elicited the highest response rates respectively as the type of training offered by participating libraries in KwaZulu-Natal.

The number of responses to this question from participating libraries in Limpopo province was 30; only three respondents did not reply to this question. The responses indicated that formal training classes (11/30 - 36.66%), informal assistance (10/30 - 33.33%) and one-on-one training sessions (9/30 - 30%) elicited the highest response rate respectively as the type of training offered by participating libraries in Limpopo province.

### 5.3.6. Public library involvement with community services and future plans

The purpose of this section was to determine whether participating libraries were working with partners in the community in an effort to address the digital divide. The section also addressed questions on the following: participating libraries' planning initiatives for the near future and who they thought should take the responsibility for addressing the digital divide. Lastly the respondents were asked to mention any other issues of importance that could shed light on how public libraries could help in bridging the digital divide**.**

#### (a) Collaboration with the community

Public libraries were requested to indicate whether they were working with partners in the community to address the digital divide.

The number of respondents to this question from participating libraries in the three participating provinces was 102; a total number of 145 respondents did not reply to this question. Of those who replied to the question, 88/102 (86.27%) reported that they were working with partners in their communities. This is shown in Figure 5.10. Fourteen of the 102 (13.73%) respondents from participating public libraries reported that they were not working with their communities. The next section will address the responses per province.

Fifty-one respondents from participating libraries in Gauteng province replied to this question; 79 did not reply. Of those who responded, 45 (88.23%) reported that they were working with partners in their communities, while six (11.76%) reported that they were not working with any partners in their communities.

The number of respondents to this question from participating libraries in KwaZulu-Natal was 34; 50 respondents did not reply. Of those who replied, 28 (82.35%) reported that they were working with partners in their communities, while six (17.65%) reported that they were not working doing that.

Seventeen respondents from participating libraries in Limpopo replied to this question; 16 did not. Of those who replied, 15 (88.24%) reported that they were working with partners in their communities. Only two (11.76%) reported that they were not working with any partners in their communities.

Table 5.45 presents the type of partners in the communities who were working with participating libraries. The second column in table 5.46 indicates the number of respondents from participating libraries who indicated a particular partner. It must be noted that some respondents indicated more than one partner.

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**Table 5.45: Partners in the communities working with participating libraries**

| Type of partners | Number/percentage of respondents N=102 |
|---|---|
| Local schools | 20 (19.60%) |
| Local municipalities | 30 (29.41%) |
| Library committee members | 24 (23.52%) |
| Local churches | 14 (13.72%) |
| Non-governmental organisations | 32 (31.37%) |
| Local business associations | 29 (28.43%) |

**(b) Participating libraries' planning initiatives for the near future to address the digital divide**

Participants were requested to indicate whether they were planning initiatives for the near future to address the digital divide. The number of respondents to this question from participating libraries in all three provinces was 67/247 (27.12%); 180/247 (72.87%) respondents did not reply to this question. Of those who replied, 59 (88.06%) respondents reported that they were planning some initiatives for the near future to address the digital divide; eight (11.94%) respondents reported that they were not planning any initiatives.. The next section discusses responses per province.

In Gauteng 34/130 (26.15%) respondents replied to this question, while 96/130 (73.84%) did not reply. Of those who replied, 31 (91.18%) reported that they were planning such initiatives.

The number of respondents to this question from participating libraries in KwaZulu-Natal was 25/84 (29.76%); 59/84 (70.23%) respondents did not reply to the question. Of those who responded, 20 (80%) reported that they were planning some initiatives in the near future to address the digital divide. Only five (20%) reported that they were not planning any initiatives.

The number of respondents from participating libraries in Limpopo was 8/33 (24%); 25/33 (75%) respondents did not reply to the question. Of those who

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responded, seven (87.5%) reported that that they were planning such initiatives and only one respondent (12.5%) reported not planning any initiatives.

The following are future plans as reported by participating libraries in all three provinces:

- **Organising information sessions**: There were plans to arrange information sessions with the communities to indicate the benefit of using ICTs such as the internet;
- **Launching ICT projects**: There were plans to implement more ICT-related projects for the financial year 2011/2012 in collaboration with the relevant provincial library services;
- **Expanding the library space:** There were plans in some libraries to extend the library space to ensure that more library members and (ICT) infrastructure could be accommodated;
- **Visiting local schools:** There were plans to visit local schools in order to market library services, especially ICT resources such as computers and the internet;
- **Providing training:** There were plans to arrange training on the use of the internet to local schools;
- **Extending the internet kiosk:** It was not specified what the internet kiosk is.
- **Acquiring computers:** There were plans to purchase more computers;
- **Connecting computers to the internet:** There were plans to connect more computers to the internet;
- **Automating library:** There were plans to introduce online systems, especially for library operations such as acquisitions and finance.

## 5.4. DATA FROM HEADS/REPRESENTATIVES OF PARTICIPATING PUBLIC LIBRARIES

As explained in Chapter 4 (section 4.6.2), the other participants in this study were heads/representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal

in South Africa. This section presents the data that were collected through semi-structured individual interviews with heads/representatives of participating public libraries. The interview schedule is attached as Appendix C. Appointments were scheduled with representatives of public libraries. Eighteen representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal were invited to participate in the interviews. All representatives who were invited participated in the study.

Data were analysed and presented according to general information, ICT infrastructure services, public libraries and the digital divide, training of staff and users, and their future plans and opportunities.

### 5.4.1. General information

The findings show that of the public library representatives interviewed, eight were from public libraries in Gauteng, six from KwaZulu-Natal and four from Limpopo. Table 5.46 shows the numbers of representatives from participating public libraries.

**Table 5.46: Number of representatives from participating public libraries**

| Provinces | Number of library representatives N=18 |
|---|---|
| Gauteng | 8 |
| KwaZulu-Natal | 6 |
| Limpopo | 4 |

### 5.4.2. ICT infrastructure and services

**(a) Suitability of ICT infrastructure and its impact on bridging the digital divide**

Interviewees were requested to comment on the suitability of their ICT infrastructure. All 18 participants indicated that their public libraries did have computers that provided public access to the internet. Budget constraints were mentioned as a serious challenge to many public libraries. Fifteen of the 18

participants indicated a shortage of funds as the main challenge for public libraries. The following are some of the comments:

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**Selected responses to the interview question on: Can you comment on the suitability of your ICT infrastructure and its impact on bridging the digital divide?**

- *We do have computers for access by library users but that is not enough as funding from the government is not coming forth.*
- *The infrastructure is suitable as we do have computers and internet access, but the problem is that municipality reduces our budget on annual basis, this makes impossible for us to be able to sustain the provision of computers.*
- *With more funding we can be able to ensure that we have ICT infrastructure to participate in addressing this digital divide.*

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The findings show that public libraries relied on their ICT staff from municipalities or parent organisations. The availability of ICT staff did not seem to be a burning issue, as they had support in this regard. The reason for the lack or shortage of ICT staff at public libraries has been that ICT experts can earn higher salaries working for private organisations rather than working for the public sector, particularly public libraries. Some of the selected responses are as follows:

---

**Selected responses to the interview question: Can you comment on the suitability of your ICT infrastructure and its impact on bridging the digital divide?**

- *You cannot retain these young ICT experts, once you provide them with training, the next things they got a better job at some private company.*
- *ICT experts can make more money outside public libraries, so they do not want to stay for long here.*

---

Five out of 18 participants indicated that their public libraries had systems librarians to assist with ICT matters. It was emphasised that their presence assisted public libraries to render better services in terms of providing computer and internet access to enable them to play a role in addressing the digital divide. It was noted that there were some technical ICT issues that systems librarians were unable to resolve. As a result, some public libraries got assistance from outside private ICT technicians. The following are selected responses:

> **Selected responses to the interview question: Can you comment on the suitability of your ICT infrastructure and its impact on bridging the digital divide?**
>
> - *The larger part of ICT of our local municipality is outsourced so when we have problems, outside technicians are called to assist.*
> - *We are more relying on external technicians who comes either once or twice a week or when we log a call.*

It was also indicated that some public libraries did have their own ICT units, but were supplemented by their parent organisations. Six participants indicated that that their staff had no capability to provide ICT solutions and this had a great impact on their role in addressing the digital divide.

### 5.4.3. Public library and the digital divide

**(a) Opinion on the digital divide**

Participants were asked to give their opinion on the concept of the digital divide. Only eight of the 18 had an idea of what the digital divide was about and were able to express an opinion. The general view was that the digital divide is of great concern globally, but especially in Africa. There is a strong need for the government to intervene. The community should also be encouraged to join this effort to reduce the chasm between the rich and the poor. Some selected responses are:

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> **Selected responses on the interview question: What is your opinion on the digital divide?**
>
> - *I think the digital divide is a reality; there is a gap between poor, especially in our rural areas and those at your urban area in terms of ICT access.*
> - *We need to address this divide, I appeal for the government to intervene by providing more funding so that we can purchase more computers and connect them so that our users can have access to the internet.*
> - *The digital divide have to be addressed by all, including the community, so that they can value what we do to them ... as public libraries we can work with community to collect more computers through donations and be able to provide access to internet.*

When analysing the participants' perceptions on the digital divide, the following issues stand out:

- There is a gap in ICT access.
- This gap exists between the rural and urban areas.

Ten of the 18 participants had no idea of what the digital divide was about. Consequently they were unable to articulate their opinions on the digital divide. It was obvious that they did not even know what the concept implied or meant. Below are some selected responses:

> **Selected responses on the interview question: What is your opinion on the digital divide?**
>
> - *I think the digital divide is necessary as it will help users to access electronic resources.*
> - *The digital divide to me will bring more opportunities for libraries to render better services.*
> - *We should all participate in the digital divide, it is necessary to get involved.*

These are just a few of the responses to indicate that some participants seemed to have no idea whatsoever about the concept of digital divide. Those who understood the concept were able to express their opinions and describe the concept, as indicated earlier.

**(b) Role public libraries can and should play in bridging the digital divide, as well as the reasons for point of view**

Participants were requested to indicate roles public libraries can and should play in bridging the digital divide and to give reasons for their point of view. They were requested to pay attention to the following: roles of public libraries in general and those of their own libraries.

To address the digital divide, participants indicated several roles they thought public libraries could play. Most often mentioned was the provision of computers by public libraries (8/18) provision of internet access (7/18) training of library users to use computers and the internet (6/18), and offering classes or workshops on using computers and the internet (4/18).

**(c) Initiatives in which their libraries are involved in attempting to address the digital divide**

Participants were also requested to describe any initiatives in which their public libraries were involved. Twelve participants indicated that their public libraries had undertaken some initiatives to address the digital divide. They mentioned the following:

- Provision of computers to poor communities;
- Training of school learners to use the internet to do their assignments;
- Expansion of the public library by adding more computers and internet access points. The library will use Wi-Fi technology to provide internet connections;
- Purchase of more computers for the main library and its branches;
- Installation of wireless technology at the library;

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- Provision of an ICT training programme for library staff;
- Training more community members on how to use computers and the internet.

Three out of eighteen participants indicated that their libraries did not have initiatives at the time but were working on plans to address the digital divide in future.

**(d) Responsibility for bridging the digital divide**

Participants were requested to indicate who should take the responsibility for bridging the digital divide. The national government featured most often, mentioned by 14/18. Others mentioned included provincial library services (9/18), the private sector (8/18), local municipalities (7/18), librarians (7/18) and the community (4/18).

**(e) Public library staff's preparedness and support in addressing the digital divide**

Participants were requested to indicate whether they thought public library staff were sufficiently prepared and supported in addressing the digital divide. Seven participants responded negatively. The reasons noted were lack of sufficient funding by the government and lack of commitment among parent organisations such as local municipalities. Lack of ICT training for staff was also cited. Apparently most of the public libraries are poorly funded and are forced to depend on external funders for support.

Five of the 18 participants indicated that they were not sure whether public library staff was prepared and if there was enough support.

> **Selected responses to the interview question: Do you think that the public library staff is sufficiently prepared and supported in addressing the digital divide? Will you please elaborate?**
>
> - *I am not really sure if our library staff are prepared to deal with this divide.*
> - *Well, I don't know, I guess we are not yet ready to tackle this digital divide, the thing is staff is not well trained. But honestly I am not sure.*

Six participants indicated that they thought public library staff was prepared and supported in addressing the digital divide.

> **Selected responses to the interview question: Do you think that the public library staff is sufficiently prepared and supported in addressing the digital divide? Will you please elaborate?**
>
> - *Yes, we are ready … our metro  is providing us with support to implement most of our ICT projects and our staff is well trained and ready to deal with the digital divide.*
> - *The staff is ready; we received some computers from an ICT grant from the provincial library service, so we are prepared to work on.*
> - *We have a backing from our local municipality on the provision of computers and internet, with less political interference we are ready and we will continue to roll out our plans to connect our library and yes, the staff is ready enough.*

These are just some of the responses to the question. Though there was a slightly higher percentage (7/18) of participants who indicated that they did not think library staff was prepared and supported, there was also a fair percentage (6/18) that indicated that they thought the opposite. The other participants (5/18) indicated that they were not sure.

**(f) Opinion about partnerships with community members in bridging the digital divide**

Participants were requested to share their opinions regarding partnerships with community members to address the digital divide. All 18 participants indicated that partnerships with the community were essential in order to bridge the digital divide. Many believed that public libraries were best placed to provide public access in their communities, and therefore partnerships with community members were significant. Partnerships with community members were also described as extending the hand of public libraries to reach out to many people who might have been left behind in respect of participation in the digital era.

**(g) Challenges encountered in efforts to address the digital divide**

Participants indicated that they were hampered by a number of factors in their efforts to address the digital divide. Table 5.47 indicates that the challenges/barriers mentioned most often were lack of adequate funding (15/18), lack of ICT resources and infrastructure (13/18), lack of ICT skills among library users (12/18), lack of ICT qualified staff (11/18), reluctance of staff to use ICTs (10/18), theft of computers and other equipment (10/188), political interference by councillors (8/18), lack of commitment of parent organisations (7/18) and lack of physical space (5/18).

**Table 5.47: Challenges encountered in efforts to address the digital divide**

| Challenges | Frequency N=18 |
|---|---|
| Lack of adequate funding | 15 |
| Lack of ICT resources and infrastructure | 13 |
| Lack of ICT skills by library users | 12 |
| Lack of ICT qualified staff | 11 |
| Reluctance of staff to use ICTs | 10 |
| Theft of computers and other equipment | 10 |
| Political interference by councillors | 8 |
| Lack of commitment of parent organisations | 7 |
| Lack of physical space | 5 |

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**(h) Views on addressing the above-mentioned challenges**

Participants were requested to share their views on addressing the challenges raised above. The following views were mentioned:

- The national government should provide adequate funding to public libraries.

- There is a need to assist public libraries with the deployment of more ICT resources and infrastructure by either provincial library services or local municipalities.

- Public libraries should provide more ICT training to their users.

- Public libraries should request more funding to recruit and retain ICT qualified staff.

- Staff members should be offered workshops on the advantages of using ICTs to reduce their level of reluctance.

- Public libraries must invest in security to safeguard their equipment.

- With more funding, public libraries should expand their physical spaces to accommodate more users and equipment.

Participants also expressed concern about political issues and interference by politicians such as councillors; they tend to dictate what libraries must do. One of the quotations regarding the issue is as follows:

> **Selected response to the interview question: What are your views on addressing such challenges?**
>
> - *Our public libraries have proper plans and priorities on how to roll projects, but in most cases some politicians would like these plans to be implemented on their preferred areas where there have interests. This is a huge drawback to our service delivery.*

Parent organisations, especially local municipalities, have been heavily criticised for not demonstrating proper commitment to public libraries. More often library budgets are reduced on an annual basis while other departments get increases

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in their annual budgets. Municipalities are alleged to have a tendency to target public libraries when restructuring. One of the selected responses is:

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**Selected response on the interview question: What are your views on addressing such challenges?**

- *Local municipalities will cut a library budget when encountering financial crisis, they would reduce library space to accommodate other units, and even freeze some of libraries' vacancies.*

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### 5.4.4. Training of staff and users

### (a)Training necessary to bridge the digital divide

Participants were requested to indicate the training they thought might be necessary to bridge the digital divide for staff, library members and non-members.

### *(i) Staff*

Eight out of eighteen participants indicated that training on the use of the internet to the staff members is essential to address the digital divide. The other participants (10/18) could not think of any type of training necessary for staff. Fifteen of the 18 participants indicated that they believed that staff members were trained at tertiary institutions to enable them to assist library users. Some selected responses are:

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**Selected responses on the question: What training do you think is necessary to bridge the digital divide? (Please comment on the focus and type of training, e.g. computer literacy training, information literacy training, internet searching.)**

- *I think library staff is trained at their respective library and information science schools at universities, so they should have the skill to assist users.*
- *We are well trained at universities/colleges, so we don't really need training unless it's refresher training, most of us after graduating, we are well equipped.*

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### *(ii) Library members*

All 18 participants indicated the types of training necessary for library members. Table 5.48 reflects the types of training mentioned by the participants. Training in internet searching was mentioned most often (16/18) and computer literacy training (15/18) second most. Information literacy training was mentioned by six of the 18, other types of training by nine participants. This included use of social network tools, training in database searching and training in multimedia tools.

**Table 5.48: Types of training necessary for library users to bridge the digital divide**

| Type of training | Frequency N=18 |
|---|---|
| internet searching | 16 |
| Computer literacy | 15 |
| Information literacy | 6 |
| Use of social network tools | 3 |
| Database searching | 3 |
| Multimedia tools | 3 |

### *(iii) Non-library members*

All 18 participants agreed that the same type of training necessary for library users is necessary for non-library members. Some of the responses are:

**Selected responses on the question: What training do you think is necessary to bridge the digital divide? (Please comment on the focus and type of training, e.g. computer literacy training, information literacy training, internet searching.)**

- *They are all human beings, so the very same training necessary to library users, will be applicable to them as well.*

- *They are all entitled to get necessary training, the only difference is that one group is the registered members and the other group is not registered members, so it will all depend on the particular library if they want train them or not.*

**(b) Library involvement in training initiatives**

Participants were requested to indicate whether their public libraries were involved in any training initiatives. Nearly all participants (17/18) answered affirmatively. Only one participant said "no", since his/her library did not have the capacity to be involved in any training initiatives. The training initiatives reported by public libraries are presented in Table 5.50.

The following initiatives are common to most of the public libraries: training of library users to use internet facilities (13/18), training of community members in using library facilities (11/18), training on general computer use (9/18), information literacy training (7/18) and training on the use of social networks tools (5/18). The responses are reflected in Table 5.49.

**Table 5.49: Training initiatives reported by public libraries**

| Type of training initiative | Frequency N=18 |
|---|---|
| Use of Internet facilities | 13 |
| Use of library facilities available to community members | 11 |
| General computer use | 9 |
| Information literacy | 7 |
| Use of social networking tools | 5 |

**(c) ICT training and its links to bridging the digital divide**

Participants were asked to indicate whether ICT training explicitly linked to bridging the digital divide was offered at their libraries. Eleven participants answered affirmatively. They believed that by training their users to access and use the internet, they were addressing the digital divide. Nine out of the 18 participants indicated that by providing computer literacy training, they were opening a gateway for users to be able to access and use ICTs and therefore they were addressing the gap.

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Seven of the 18 participants said "no" in answer to the question, as they were not sure if their ICT training was linked to bridging the digital divide. Training that in the opinion of participants was not specifically linked to bridging the digital divide included training on the library's automated systems, such as circulation administration, registering users, and the generation of statistical reports.

### 5.4.5. Future plans or opportunities

The participants were requested to indicate if they had any plans for the near future to address the digital divide. They were also requested to indicate the strategies required for libraries to contribute effectively to addressing the digital divide and to indicate any other issues that should be noted.

**(a) Plans for the near future to address the digital divide (e.g. within the next year or two)**

Participants were requested to indicate their plans for the near future to address the digital divide. All 18 participants indicated that their libraries had plans, which included:

- Purchasing more computers;
- Connecting computers to the internet;
- Developing ICT training programmes;
- Upgrading computers and other ICT equipment;
- Automating the library;
- Training more library users and community members;
- Generating more funding by applying to different donors; such funding can improve the ability to purchase ICT resources.

**(b) Strategies required to allow public libraries to contribute effectively to addressing the digital divide**

Participants were asked to indicate strategies required for public libraries to address the digital divide. Fourteen out of eighteen participants indicated that ICT strategies had to be developed to assist public libraries in addressing the digital

divide. Support with writing proposals for funding was mentioned by 13/18 respondents, while five of the 18 indicated that as one of the required strategies, the use of a website to provide a public library service to users should be considered. Equipping public library staff with appropriate skills relating to digital resources and the provision of electronically based information services was mentioned as another strategy required by public libraries to contribute effectively to addressing the digital divide. This was mentioned by 11/18 respondents.

## 5.5. CONCLUSION

This chapter presented the data collected from the semi-structured interviews with directors of provincial library services in South Africa, as well as the data collected from public libraries in Gauteng, Limpopo and KwaZulu-Natal through a questionnaire, and through individual semi-structured interviews with selected heads/representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal. Seven directors of provincial library services participated in this study through interviews, 247 questionnaires were collected from public libraries in Limpopo, Gauteng and KwaZulu-Natal and 18 interviews were conducted with heads/representatives of public libraries in these provinces. The next chapter discusses the proposed model for public libraries in bridging the digital divide.

# CHAPTER SIX: LITERATURE REVIEW UPDATE AND FINDINGS FROM LIMITED FOLLOW-UP SURVEYS IN THREE PROVINCES

## 6.1. INTRODUCTION

The purpose of this chapter is to review the literature on the digital divide appearing after the time of planning data collection – thus from mid-2011 to 2015. In addition to earlier findings, this is used to contextualise discussion of the proposed models for the role of public libraries in addressing the digital divide (Chapter 7), and discussion in the concluding chapter (Chapter 8).

New factors contributing to the digital divide, new attempts to bridge the digital divide, the impact of technological developments and specifically mobile access and smartphones, as well as the status of the digital divide in South Africa in 2015 are also considered. The chapter ends with a discussion of findings from follow-up surveys of limited scope in the three key provinces participating in the initial survey (i.e. Gauteng, KwaZulu-Natal and Limpopo) to determine the status quo of public library attempts to bridge the digital divide four years after completing the initial data collection.

## 6.2. FACTORS CONTRIBUTING TO THE DIGITAL DIVIDE

Many of the factors influencing the digital divide that were noted at the time of planning the study are still valid: lack of physical access to ICTs, specifically computers and the internet; lack of skills, capacity, support and appropriate content; attitudinal barriers and large groups of people falling into low income and poor education categories, who often also have lower language proficiency. Racial segregation, gender and age, concerns about security and privacy, as well as physical disability, are also noted in recent literature as having a negative impact on the digital divide (Adebesin & Kotze, 2012; Ferro, Helbig & Gil-Garcia, 2011; Jaeger *et al.,* 2012; Kizza, 2013; Loo & Ngan, 2012; Middleton & Chambers, 2010; Morris, 2007; Morris, Goodman & Brading, 2007; Varallyai, Herdom & Botos, 2015). In addition, legal and regulatory frameworks not addressing the digital divide have been noted to contribute to this divide (Ba, 2005; Varallyai, Herdon & Botos, 2015).

Since empirical data collection in 2011, the impact of culture, security and access difficulties due to interface design have also become more prominent (Adebesin & Kotze, 2012). According to Adebesin and Kotze (2012), design should address both usability and accessibility. Poor design can lead to what Nielsen (as cited by Adebesin & Kotze, 2012) refers to as the 'usability divide'. With regard to culture, people belonging to different cultures may have different perceptions of ICT; this may lead to different ICT adoption rates (Varallyai, Herdon & Botos, 2015). Low-uncertainty-avoidance cultures, for example, have been found to make greater use of recent technological innovations, such as the internet, than do high-uncertainty-avoidance societies (Zhao, Collier & Deng, 2014)**.**

## 6.3. LATEST ATTEMPTS TO BRIDGE THE DIGITAL DIVIDE

Ongoing attempts to bridge the digital divide have been reported over the last few years. A few of the most recent projects are noted below.

In South Korea an Information Technology Training Centre (ITTC) initiative to educate the public by means of free computer classes in rural and agricultural areas was established. In 2003 the ITTC was reorganised into the Korea Agency for Digital Opportunity and Promotion, with the specific goal of systematically addressing the digital divide (Park & Kim, 2014).

In the United States of America, the Connect2Compete project aiming to provide a digital literacy training model for public librarians was established (Real, Bertot & Jaeger, 2014). Kruger and Gilroy (2013), and Real, Bertot and Jaeger (2014) report on selected federal assistance programs in the United States of America that provide competitive grants and seed funding to public and private sector entities to establish broadband access in unserved and under-served areas, strategic institutions as well as public safety agencies. These include the Broadband Technology Opportunities Program, Broadband Initiatives Program, Rural Broadband Access Loan and Loan Guarantee Program, and the Community Connect Broadband Grants.

Kizza (2013) reports on initiatives by African universities and institutions as a result of young people's interests in ICTs. Such initiatives are often aimed at contributing to

capacity building in the use of ICTs. In Uganda Nakaseke MCT was established to provide a centre where the rural community could access ICTs and where it could be checked whether providing ICTs to indigenous communities could catalyse their development and improve the quality of their lives (Chisa & Hoskins, 2014). In Latvia, the global libraries initiative of the Bill and Melinda Gates Foundation was initiated in collaboration with the Latvian government and local authorities. It focused on public libraries and the facilitation and promotion of the use of resources by offering free access to ICTs and the internet in public libraries (Balina, 2014). The Jordanian government has also enunciated a policy for national growth and development that is grounded on the nexus between ICTs and the community (Obeidat, 2015).

It is, however, clear that even though there might be progress in bridging the digital divide, it has not been fully achieved and there is still interest in reaching this aim and thus a role for public libraries to play.

## 6.4. IMPACT OF MOBILE TECHNOLOGY INTERNET ACCESS: GENERALLY AND WITH REGARD TO PUBLIC LIBRARIES

In recent literature the impact of mobile phones and especially smartphones on access to information and the internet has been noted by Lee, Park and Hwang (2015), Li (2013), Liu and Briggs (2015), Negi, (2014), Nishida, Pick and Sarkar (2014), Park and Lee (2015), Prieger (2013), Richardson (2015), Samii (2015) and Srinuan *et al. (*2012). At the start of the study in 2006, mobile technology providing access to the internet was, however, less prominent; this also applies to smartphone usage in South Africa (see section 6.5.2 for more detail). To contextualise the proposed models for the role of public libraries in addressing the digital divide (see Chapter 7), the role of mobile technology and especially smartphones at the conclusion of the study also needs to be considered.

With the emergence of internet-enabled mobile phones and the lower bandwidth adaptations of applications, particularly social media, mobile phones are increasingly becoming important as key entry point for internet adoption (Stork, Calandro & Gillwald, 2013). Mobile broadband coverage appears to fill many of the gaps in fixed

broadband coverage in rural areas (Prieger, 2013); people access information and interact with social networks via smartphones (Mansour, 2016; Park & Lee, 2015). One of the trends that have driven the growth of mobile internet in Thailand is the introduction of third-generation mobile technology (3G) and improved coverage of mobile infrastructures (Srinuan *et al.*, 2012). In their study on mobile learning and the digital divide regarding South African students, Harpur and De Villiers (2012) found that students had become accustomed to mobile technology through necessity, unintentionally reducing the digital divide. In their opinion mobile learning environments, as part of the educational context, can further reduce the digital divide. A study by Hargittai and Kim (2012) found that African Americans engage with more diverse types of mobile phone functionalities and are more likely to use their phones for accessing e-mail or the Web, playing games, listening to music and using picture and video features than any other group.

In July 2014, Vodafone UK commissioned Tinder Foundation to complete a project on the benefits of mobile devices (Tinder Foundation, 2015). They found that 88% of the people who took part in the project improved their digital skills during the project through their use of mobile technology. Their motivations for and use of the internet also changed dramatically. About 78% of people who were loaned a tablet or smartphone said they found the interface more intuitive and easier to remember than that of a laptop or desktop, leading to changes in online behaviour and more regular use (Tinder Foundation, 2015). In a study in China, Srinuan, Srinuan and Bohlin (2012) found that since the introduction of mobile telecommunication in China, the digital divide has started to narrow.

In part it thus seems as if the rapid uptake of mobile technology and specifically smartphones has remedied the problem of access to the internet (Park & Kim, 2014; Park & Lee, 2015). The benefits of mobile internet are seen as offering an alternative to bridging the digital divide, in particular for developing countries (Harpur & De Villiers, 2012; Loo & Ngan, 2012; Mir & Dangerfield, 2013; Park, Lee & Hwang, 2015; Reddick *et al.*, 2012; Richardson, 2015; Samii, 2015; Srinuan *et al.,* 2012). Although mobile phones may contribute to bridging the digital divide in terms of access and more intuitive user interfaces, skills in identifying information needs, finding appropriate information, assessing the quality and appropriateness of

information and using information are still a serious issue not sufficiently addressed by access via mobile technology.

Following the rapid and worldwide adoption of mobile technology, libraries are exploring the potential of mobile technology to improve access to information and library services (Little, 2011; McEwen & Scheaffer, 2012; Palumbo, 2014). Negi (2014) and Little (2011) report on a wide variety of initiatives, namely mobile access to OPACs, databases and e-books; mobile applications developed by libraries; partnerships with third-party content providers to provide access to audiobooks, audio language courses, streaming music and films; mobile library instruction and mobile learning opportunities; virtual reference services; short message service (SMS) notifications, e.g. for notification of items available for pickup, due date reminders; the use of Web 2.0 technologies such as Twitter, Flickr, YouTube, LinkedIn, Google Groups, Facebook, and WeChat. Libraries are using these social media tools for marketing and to promote collections and services to users (Baro, Ebiagbe & Godfrey, 2013; Dzokotoe, Plockey & Amuda, 2013; Negi, 2014; Xu, Kang, Song & Clarke, 2015). In addition, quick response (QR) codes are used to link users to web sites, event details, et cetera (Little, 2011; Palumbo, 2014).

Although mobile technology (especially smartphones) address many of the earlier concerns of the digital divide in terms of access to ICTs and the internet, it introduces new challenges in terms of information literacy skills and especially the skills required by librarians. Little (2011) suggests librarians need special skills, perhaps even more than users, to understand and utilise smartphones and new mobile technologies, recognise and analyse trends, and come up with strategic responses. Unlike previous changes in technologies, such as from filmstrip to videotape, the move to smartphone searching brings with it a change in search behaviour by users (Walsh, 2012). These changes provide an opportunity to reconsider library services and library users' access to content (Bell & Peters, 2013; Bombold, 2014; Jingru, 2013).

## 6.5. DIGITAL DIVIDE IN SOUTH AFRICAN CONTEXT IN 2015

### 6.5.1. Internet access as a specific focus of the digital divide: brief review based on the literature and available statistics

In 2015 Oyedemi reiterated the fact that South Africa, as a developing country, is still confronted with the digital divide. Some improvements have, however, been made in terms of internet access: In 2012 Vodacom launched 100 Mbps Long-Term Evolution (LTE), commonly marketed as 4G LTE. It is a standard for wireless communication of high-speed data for mobile phones and data terminals (Telkom, 2015). In 2013 South Africa Connect was established, focusing on broadband access; in 2014 Telkom launched 150 Mbps Long-Term Evolution Advanced and 100 Mbps fibre-to-the-home, and in 2015 fibre-to-the-home installations offering increased speeds of up to 1 Gbps (Sooryamoorthy, 2015;Telkom, 2015).

The Cisco Visual Networking Index (2015) indicates that South Africa is expected to see a rise in internet traffic as more people switch to smartphones and smart devices. The Internet World Statistics (2015), referring to the figures for 2014, ranks South Africa third in Africa in the number of internet users. The percentage of internet penetration in South Africa is 24.9% compared to 70.3% for Nigeria and 46.2% for Egypt. Table 6.1 presents internet usage in South Africa between 2013 and 2015.

**Table 6.1: South African internet usage and population figures (Internet World Statistics 2015)**

| Year | Internet users | Population | Percentage |
|------|---------------|------------|------------|
| 2013 | 4,590,000 | 52,981,991 | 10.5 % |
| 2014 | 24,909,854 | 54,001,953 | 51.5 % |
| 2015* | 33,464,764 | 54,777,809 | 61.1 % |

Table 6.2 presents the status in South Africa in terms of fixed telephone penetration, mobile broadband subscription, individuals using the internet and fixed broadband subscription.

**Table 6.2: ICT statistics in South Africa (ITU, 2015)**

| Indicator(s) | 2012 | 2013 | 2014 |
|---|---|---|---|
| Percentage of fixed telephone subscription | 9.25 | 7.34 | 8.10 |
| Mobile-cellular subscriptions | 68 394 000 | 76 865 278 | 79 540 205 |
| Percentage of individuals using the internet | 41.00 | 46.50 | 49.00 |
| Fixed-broadband subscriptions | 1 107 200 | 1 615  210 | 1 706 313 |

## 6.5.2. Specific focus on developments in mobile access to the internet

South Africa has five mobile operators, namely Cell C, MTN, Vodacom, Telkom Mobile and Virgin Mobile (South African Yearbook, 2013/14). According to the *South African Yearbook* (2013/14), people in South Africa mostly access the internet via their mobile phones. According to research commissioned by infoDev, a global partnership programme within the World Bank Group, mobile phones are the dominant technology for voice and data communication among users and for informal businesses. Accessing the internet mostly via mobile phones and smartphones has taken over functions such as booking daily appointments, address books, emails, photos and music. It even allows access to the internet that used to be performed by computers. Users are also finding innovative ways to bypass expensive cellphone SMS rates by using FacebookZero or other instant message services such as WhatsApp (*South African Yearbook*, 2013/14).

According to *South African Yearbook* (2013/14), 98.5% of people who own mobile phones in South Africa have a prepaid SIM card, but there is a small percentage (1.5%) of mobile owners who have post-paid contracts. According to a survey conducted by Effective Measure (2014), 80.2% of internet users in South Africa use their smartphones to access the internet, while 19.8% of the users use traditional methods of access such as using personal computers. The lowering of the mobile termination rates from R1.25 a minute in 2010 to R0.40 from March 2013 represents a significant milestone in reducing the cost of communicating (*South African Yearbook*, 2013/14).

### 6.5.3. Initiatives taken in South Africa to bridge the digital divide

*6.5.3.1. Initiatives by government*

**(a) Mzansi Libraries On-Line**

The Mzansi Libraries On-Line project is operated by the National Library of South Africa and the Department of Arts and Culture (DAC). It is a collaborative effort supported by the various provincial library services and the respective municipalities where the public libraries are situated, as well as other relevant stakeholders. The project is funded by the Bill and Melinda Gates Foundation. A pilot project was conducted between 2013 and 2015, with 27 libraries in total (three libraries from each of the nine provinces). Mzansi Libraries On-Line focuses on adding value to the lives of local communities through the provision of free access to ICTs, the improvement of other related services and the provision of relevant training to library staff (Mzansi Libraries On-Line, 2015). The pilot project aimed to demonstrate the essential role of public libraries in developing an informed nation in South Africa. A full-scale programme for national implementation was planned at the time of writing (Mzansi Libraries On-Line, 2015).

**(b) Cape Access Project**

In keeping with its "Better Together" slogan, the Western Cape government addressed the rural digital divide through the Cape Access Project. The goal of the project is to provide computers with internet connection in community centres, libraries and any points that can be easily accessed by the Western Cape public in remote areas. Access to the computers is free of charge and each user gets a limited daily usage duration as well as benefits such as a free personal e-mail address and access to databases with information on training and jobs. At the time of writing the project had established a total of twenty e-Community Centres in the Western Cape Province (Cape Access Project, 2015).

*6.5.3.2. Initiatives by non-profit organisations*

**(a) Project Isizwe**

Project Isizwe is a non-profit organisation that aims to bring the internet to people across South Africa, by facilitating the roll-out of free Wi-Fi for public spaces in low-income communities. The main focus is on internet connections for educational purposes. Isizwe works with local, district and provincial governments (Isizwe, 2015). The project also addresses inequality in social networking, access to online jobs, online learning, remote healthcare and access to local news (Isizwe, 2015).

*6.5.3.3. Initiatives by private sector*

Only one project from the private sector is noted, namely Huawei. The project focuses on giving people across all geographic areas easy access to voice communication services, supporting broadband access for all, improving ICT knowledge and nurturing ICT professionals (Huawei, 2015). According to their documentation they are committed to sharing expertise and innovative ideas with other stakeholders across Africa (Huawei, 2015).

## 6.6. LIMITED FOLLOW-UP SURVEYS IN THREE PROVINCES

This section presents the follow up data that were collected, as explained in Chapter Four (section 4.8.3), through interviews with the directors of the three key provincial library services participating in the study, namely Gauteng, KwaZulu-Natal and Limpopo. The directors were interviewed (via Skype) to collect data on the progress made and new developments since the time of the initial data collection in 2011/2012.The interviews took place between October and November 2015. Each interview lasted approximately half an hour (30 minutes), during which the interviewee was asked ten questions.

The interview schedule for the follow-up interviews is attached as Appendix D. It covers the following: availability of policies to bridge the digital divide; new initiatives to address the digital divide; keeping statistics on how computers are used and what they are used for; perceptions of the reliability of internet connections; use of surveys to determine user, staff and community needs; perceptions on support to users; marketing of services; and impact of mobile phones on information provision. At the

conclusion of the interviews the directors could raise other issues relevant to the topic of the study. The issues covered in the interview build on the initial interviews conducted in 2011 and 2012 and issues identified from a follow-up literature review conducted at the end of the study, covering publications for the period 2013 and 2015 (see sections 6.2 and 6.3).

### 6.6.1. Adoption of a policy on bridging the digital divide since 2011/2012

The directors were asked if they had adopted a policy on bridging the digital divide since the initial data collection in 2011/2012, and if so what it addressed. They had still not introduced formal policies on bridging the digital divide. Two directors preferred not to elaborate on the reasons for this, and one explained that they are in the process of appointing a consultant to develop and review their policies; a policy on addressing the digital divide might be included.

### 6.6.2. Initiatives from the provincial library services to bridge the digital divide since data collection in 2011/2012

Even though they still did not have formal policies, the provincial library services could all report initiatives to address the digital divide.

*6.6.2.1. Initiatives in Gauteng*

Through a conditional grant from the DAC, the Gauteng Provincial Library Services upgraded the ICT network and infrastructure at public libraries. They introduced outreach services to communities and experimented with alternative structures for libraries, such as modular libraries. These proved useful when starting library services in new communities and in dolomite areas where the building of new libraries is not allowed. (Dolomite areas are surrounded by dolomite bedrock, which is notorious for the occurrence of sinkholes that can be triggered by changes in the ground water.)

Six public libraries were extended or upgraded or were in the process of being upgraded at the time of the interview to offer an ICT training centre. The upgrades included purchasing new resources and improving the ICT infrastructure. The Johannesburg Centre of Excellence, funded by the Johannesburg Metropolitan

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Municipality and Carnegie Corporation of New York, was reopened in February 2012. The Gauteng Provincial government contributed to this project by making grant funding available for the appointment of additional staff to assist with the technical preparation of collections. Libraries in three local municipalities in the West Rand were connected to the network of the West Rand District Municipality. E-learning centres were established in the Sharpeville and Residentia libraries. Since re-opening in November 2011, they have issued 102 certificates to students trained in various aspects, ranging from an introduction to personal computers to the use of Microsoft office packages.

The Provincial Library Service funded approximately 133 additional staff positions at municipal public libraries to assist with implementing reading and learning programmes and ICT support, and to provide training to staff on the electronic library management system. In one library, the information technology librarian had the opportunity to attend a Microsoft Certified IT professional course.

A feasibility study was launched in partnership with the Gauteng Funding Agency and municipalities to construct twenty new libraries in underprovided areas in the province. Implementation started in the 2013/2014 financial year. Four libraries have already been completed. An audit, including an entire assessment of the ICT infrastructure of each library within the Gauteng Province, was done in 2012. This included an age analysis and shelf list of each piece of hardware and software according to industry standards. It was found that both hardware and software were between nine and twelve years old – thus outdated. Network cables were also often damaged. Overall, even though it still does not have a policy to bridge the digital divide, the initiatives by the Gauteng Provincial Library Service show awareness of the need to address the digital divide.

*6.6.2.2. Initiatives in KwaZulu-Natal*
In the period 2012 to the end of 2015 the KwaZulu-Natal Provincial Library Service extended the installation of internet cafes to 62 libraries. These are managed by computer library assistants, also called cyber cadets, who offer training and ICT support to the public. Use of the facilities by the public is free of charge.

Eight libraries received internet access services for the public, and approximately 42 public libraries were automated using the SITA Library Information Management System (SLIMS) to provide the public with wider access to library material. In addition, 22 mobile libraries and a fleet of four mobile library trucks were used to service areas where there are no formal libraries. Each custom-made truck has a collection of up to 5 000 books, audio-visual material, toys and computers with free access to the internet and electronic information such as encyclopaedias and reference resources. Staff members assist the public to download government information and forms, and provide photocopying facilities for important documents such as identity documents, birth certificates, marriage certificates etc. The mobile libraries use generators to ensure constant power supply, lights and functional air conditioning.

The Internet@yourlibrary project in libraries in previously disadvantaged communities provide internet cafe facilities with free internet and e-books to the public. The facilities are especially popular with the youth for typing assignments, e-mail and general information seeking. A further initiative is the establishment of a digital service for the blind at seven public libraries. This was done with support from the National Library.

### 6.6.2.3. Initiatives in Limpopo

Fewer initiatives were reported from the Limpopo Provincial Library Services. Only five public libraries were provided with ICT such as internet connections and six public libraries have been built through a conditional grant. Training of the library staff on how to use ICTs continued.

## 6.6.3. Expectations for public libraries to keep statistics on computer usage and purposes of usage

All three directors indicated that statistics were required for all services rendered, including how computers are used. One of the provincial library services developed counting systems for library users. The following responses reflect verbatim feedback.

**Selected responses to the question: Do you have or expect the public libraries to keep statistics on how the existing computers are used in libraries and what they are being used for?**

- *Yes, we expect public libraries to keep statistics of how many people use computers. It is crucial for our planning and evaluation.*
- *All our public libraries are expected to keep records on the use of library services. We expect this to be submitted as part of their reports.*
- *We have installed counting systems at 18 public libraries to enable them to keep statistics on numbers of their library users. This is another method for us to keep statics on how many people use the library.*

The computers are mostly used for typing assignments, e-mail access, general information seeking to support studies and school projects, searching for jobs and online job applications, accessing social media, applying online for bursaries, and writing and updating curriculum vitas. In many communities the library is also the only place where people can make photocopies. The computer and internet access services are thus popular in all libraries.

### 6.6.4. Internet service providers and perceptions on the reliability of internet connections

The directors of the provincial library services had mixed opinions about the reliability of internet connections. Two of the directors were satisfied with the reliability of the internet connections. This is supported by the following verbatim quotations:

**Selected responses to the question: What are your perceptions on the reliability of internet connections in the public libraries – who are your service provider(s)?**

- *Well, I think our internet speed is satisfactory and users are able to download their documents without any problems … I will say it's much better than the previous years.*

- *Internet speed is OK, we received very positive response from members of the public on the internet services.*

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The third director, however, noted that the internet access cannot satisfy the demands of the community. There is an ever-increasing demand by especially the youth for access to internet services and not all libraries are equipped to provide this service. In this province internet connections are also often unreliable in certain areas, especially in metropolitan municipalities. This director's opinion is reflected in the following verbatim quotation:

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**Selected response to the question: What are your perceptions on the reliability of internet connections in the public libraries – who are your service provider(s)?**

- *We have determined that speed for public internet access is extremely slow and that the bandwidth in most areas is not sufficient. These are serious matters that will have to receive urgent attention in the coming years.*

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All three provincial library services use private internet service providers. They use SITA for their online public access catalogues.


### 6.6.5. Surveys and other studies on the needs of users, staff and the wider community

Two of the directors indicated that they did not use any surveys, but that they used suggestion boxes at the circulation or reception desks of their libraries to determine the needs of users and the wider community. Staff needs were mostly determined at staff meetings or through email correspondence. This is supported by the following verbatim quotation:

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**Selected responses to the question: Have you used any surveys or other means of data collection to determine the (1) needs of the users; (2) the staff; (3) the wider community?**

- *We place suggestion boxes mostly at our circulation desk. A very positive response is being received from members of the public on the internet services …*

- *We held meetings with our staff and at that platform … we are able to establish their needs and desires.*

---

One of the directors, however, reported a variety of approaches to determine the needs of users and the wider community, namely user surveys, roadshows, suggestion boxes, radio slots with phone-in opportunities, open days, site inspections and social media. For staff they use organised labour structures and committees, stakeholder meetings (e.g. municipalities, public entities and Amakhosi[1]), workshops, site inspections and social media. The following is a verbatim comment from this director:

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**Selected response to the question: Have you used any surveys or other means of data collection to determine the (1) needs of the users; (2) the staff; (3) the wider community?**

- *The Department's stakeholders or customers should be regularly consulted about the level and quality of the services they would like to receive.*

---

From the interviews it was evident that all three provincial library services consulted with various stakeholders to determine their needs and feedback about the quality of services. This is supported by the following verbatim quotation:

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**Selected response to the question: Have you used any surveys or other means of data collection to determine the (1) needs of the users; (2) the staff; (3) the wider community?**

- *Our users or let me say customers include all employees in the DAC, artists, arts and culture organisations, public entities, general public of South Africa, district and local municipalities, Amakhosi, other government departments, families*
- *and dependents of DAC employees, schools, freelance practitioners, non-governmental organisations etc.*

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[1] Amakhosi – means tribal leaders regarded collectively.

### 6.6.6. Perception on support to users − access to information, ICT and gaining the skills to use these

All three directors indicated that despite difficult circumstances such as inadequate resources, shortage of staff with ICT skills and inadequate funding, they were doing their best to provide support to their users. They set program objectives aimed at integrated and functional ICT infrastructures, networks and systems for all libraries. They also launched projects to help users to gain the necessary skills though training and facilities such as internet cafes to ensure that users have access to ICT and opportunities to seek information to meet their daily information needs. The verbatim quotation below supports this.

---

**Selected response to the question: What is your perception on how well you support users in terms of access to information, ICT and gaining the skills to use these?**

- *We ensure that equal access to all departmental services is given to all our customers. This is done by ensuring that the capacity to provide relevant services is available at all levels within the department.*

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One of the directors explained that they viewed information as one of the most powerful tools to users and they did their best to ensure that users and everybody else who needs information can get access to information. The verbatim quotation below supports this.

---

**Selected response to the question: What is your perception on how well you support users in terms of access to information, ICT and gaining the skills to use these?**

- *Information access is one of our biggest objectives. We ensure that provision to information is done effectively in order to ensure that all those who need it receive it. It is also crucial to determine how, where and when information can best be provided*

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Another director felt that public libraries should be accessible on the web as well as in traditional physical spaces; they will constantly offer services that help citizens to

cope with their lives and that inspire them to use and learn from all different kinds of media available.

### 6.6.7. Marketing of services to the users, public library staff, and wider community and encouragement to use ICT

Various marketing methods are used: road-shows, booklets/pamphlets, circulars/memoranda, websites of their parent organisations (i.e. the Provincial Department on Arts and Culture), newsletters, CDs/DVDs, displays/exhibitions, visits to offices, information-sharing sessions, departmental planning sessions, advocacy campaigns and social media. These platforms are used to encourage library users, the wider community and library staff to use public libraries' services and especially ICTs. This is supported by the following verbatim quotation:

---

**Selected response to the question: How do you market your services to the users, public library staff, and wider community and how do you encourage them to use ICT?**

- *We are trying our best to encourage our users to use our services and computer facilities at our libraries …*

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One of the provincial library services also came up with a specific project to encourage users and non-users to use ICT. This is captured in the following verbatim quotation:

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**Selected response to the question: How do you market your services to the users, public library staff, and wider community and how do you encourage them to use ICT?**

- *We introduced a project to attract non-library users amongst the youth to the library with the main objective being to encourage the constructive use of leisure time by the youth. We rolled out the gaming and Wii to 20 libraries in previously disadvantaged communities. Gaming enhances literacy skills, social interaction, competition, concentration, perseverance and ICT skills to name just a few benefits. The Wii facilities encourage action and fun …*

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In addition, e-learning centres in public libraries are used to encourage the use of ICTs. School pupils, students and other members of the public can use opportunities to improve their computer skills in their own time at the library.

### 6.6.8. Impact of mobile smart phones on services

At the time of the first round of data collection (2011/2012), mobile smart phones did not have considerable penetration in South Africa. Their penetration and use at all levels and for all types of services have since drastically changed, with numerous applications for banking services, online shopping services, etc. The directors were thus asked to comment on the impact of mobile smartphones on their services. They were in agreement about the fact that there was an impact, especially among the youth.

The provincial library services are thus focusing their services on the youth, providing them with educational support material and services, access to the internet, social networking facilities, recreation opportunities and a comfortable and safe community hub in which to study and socialise. The libraries had to implement a number of interventions, such as installing Wi-Fi technologies and introducing some of their services through Apps; however, delays in appointing service providers for the latter, often hamper their plans. The response (verbatim quotation) below supports this:

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**Selected responses to the question: What impact do you think mobile phones (i.e. smart phones) have on your services?**

- *Our biggest challenges in this regard are experienced in the metropolitan municipalities and are related to the ICT networks and tenders for service providers to perform the functions not being in place.*
- *The delay in appointment of service providers for cabling and networking is affecting us to implement some of our plans …*
- *Despite the fact that there is an ever increasing demand by the youth for access to internet services through mobile phones, not all our libraries are equipped yet to provide this service.*

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There is also an increasing demand from the youth for access to social network services, e-mail, Facebook, Twitter, Instagram and communication with library staff

via email. Unfortunately not all libraries are equipped to provide these services yet. This is reflected in the last verbatim response on the previous selected responses.

## 6.6.9. Further comments

In the additional comments made by the directors, the following was mentioned:

- Specialised ICT services are not achieved because of the incapacity of the service providers to supply and deliver services; therefore the implementation of internet services for the public in many public libraries remains an area of concern.

- Many ICT challenges are experienced forcing the provincial library services to schedule inspection visits to public libraries.

- Investigations into available ICT and possible centralisation of ICT services need to be completed.

- Draft norms and standards for libraries as well as draft standard by-laws for libraries were developed.

- New library services will be fully equipped with internet access and appropriate library material, which addresses the needs of the users and responds to the needs of the community, especially the youth. (However, they did not elaborate on how they will determine such needs.)

- Public libraries are involved in building stronger communities by focusing on programmes that enhance social cohesion and thereby contributing to the socio-economic development of communities.

- An impact study by an independent service provider was conducted on the implementation of the Conditional Grant for Community Libraries. The report by the service provider noted that although the outcomes vary from community to community, the computer training provided by public libraries creating opportunities for users to gain and improve computer skills was one of the main outcomes.

- One of the biggest challenges remains access to library services; this might be partially addressed by the outreach programmes noted in the Gauteng provincial library service.

## 6.7. CONCLUSION

This chapter presented a review of the literature on the digital divide appearing after the time of planning data collection – thus from mid-2011-2015. The following topics were also discussed in this chapter: new factors contributing to the digital divide, new attempts to bridge the digital divide, the impact of technological developments and specifically mobile access, as well as the status of the digital divide in South Africa in 2015. Lastly, the findings from three limited follow-up surveys in the three key participating provinces were presented.

# CHAPTER SEVEN: PROPOSED MODELS FOR PUBLIC LIBRARIES IN BRIDGING THE DIGITAL DIVIDE IN SOUTH AFRICA

## 7.1. INTRODUCTION

Chapter 5 addressed the presentation and interpretation of data for this study. Chapter 6 addressed the literature review at the end of the study and three limited follow-up surveys in the three key participating provinces. The ultimate aim of this study was to propose a model for public libraries to bridge the digital divide – starting with South Africa. This chapter will thus address the main research question stated in Chapter 1 (section 1.5):

"How should a theoretical model look for South African public libraries to contribute to bridging the digital divide?"

A model for public libraries is fundamental in an effort to bridge the digital divide in South Africa. Factors contributing to the digital divide as reflected in Chapter 2 (section 2.4) and challenges faced by public libraries as reflected in Chapter 3 (section 3.4) are serious concerns warranting such a model. Therefore, this chapter addresses the following:

1) Factors contributing to the digital divide and challenges faced by public libraries;
2) Potential solutions for bridging the digital divide;
3) Two proposed models for public libraries to address the digital divide.

## 7.2. FACTORS CONTRIBUTING TO THE DIGITAL DIVIDE AND CHALLENGES FACED BY PUBLIC LIBRARIES

As discussed in Chapter 2 (section 2.5) and Chapter 6 (section 6.2), a number of factors are contributing to the digital divide. As a result, it is essential in the design of a model to take these factors into account. A number of factor categories were noted from the literature review and empirical study. (Some detail falls under more than one category, e.g. negative attitudes are noted under circumstances in public libraries and people-specific factors.)

**(1) Circumstances in the communities served** by public libraries, such as very poor physical access to ICTs such as computers, the internet and even

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telephones, slow internet bandwidth, expensive rates for internet use, poor ICT skills, including computer and internet skills, wide-scale poverty, wide-scale low educational levels and even illiteracy, poor ICT resources and infrastructure, legal and regulatory framework issues (i.e. absence of laws and regulations addressing ICT utilisation and its limitations) and large numbers of people for whom English (a prominent language for internet content) is not their mother tongue or first language. A country such as South Africa also suffers from the legacy of racial segregation (Singh, 2004). Racial segregation has also been noted in other countries as a factor leading to the digital divide (Novak & Hoffman, 1998 as cited in Singh, 2004).

**(2) Circumstances in public libraries and their controlling bodies (provincial library services)** such as budget cuts, inadequate funding, staff shortages, lack of training in the use of ICTs and offering information literacy programmes, lack of ICT strategies, inadequate physical space to accommodate users, lack of ICT maintenance support, lack of government support, political interference by councillors (some councillors prefer their ward to receive more priority than others), high cost of connectivity, negative attitudes (i.e. reluctance of staff members to use ICTs), and security issues (theft of equipment).

 **(3) People-specific factors** such as disability, physical and intellectual, and attitudes such as "computers are for brainy or rich people", lack of skills in using ICTs such as computers and the internet, poor education or low level of education, low income level (households at higher income levels are more likely to own computers and have access to the internet than those at low income levels), age (young people are more exposed to technology than older people).

In light of the above-mentioned factors, the next section will map the challenges faced by public libraries in addressing the digital divide against potential solutions. These solutions are based on the literature review, combined with suggestions from the empirical component. It must be noted that not all factors and challenges can be addressed by public libraries, e.g. content; an advocacy group may lobby and promote the need to offer content

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in local languages to the community that is being served and to offer content relevant to the needs of the community.

## 7.3. POTENTIAL SOLUTIONS

Potential solutions can be derived from the actions and efforts that have been reported in the literature and the empirical work from this study. Potential solutions are mapped in Table 7.1. This is not intended as an exhaustive list, but is offered to highlight selected key issues.

**Table 7.1: Potential solutions to challenges affecting public libraries**

| Identified challenges | Possible solutions noted from the literature and empirical component |
|---|---|
| Lack of funds or budget cuts | Lobby for more funding from the government. <br><br> Leverage on funding opportunities offered by other funding agencies e.g. Bill and Melinda Gates Foundation, Carnegie Foundation, etc. |
| Inadequate physical space | Find more space for libraries or extend the current buildings. |
| Staff shortage | Recruit staff with ICT, information literacy and other related skills. |
| Lack of training | Develop more training programmes to help library staff to improve on ICT skills; outsource training. <br><br> Develop digital literacy programmes from school level upwards. <br><br> Offer more ICT and information literacy training for library users and non-users. |
| Lack of government support or inadequate government support | Lobby government to initiate projects to provide access to the internet to people via libraries and to develop formal policies geared towards supporting libraries in addressing the digital divide. |
| Lack of ICT strategies | Develop and implement strategies to address the digital divide. |

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| | |
|---|---|
| Lack of ICT maintenance and support | Establish ICT infrastructure, especially ICT support units.<br><br>Train staff to be able to maintain ICT infrastructure and to provide technical support when it is needed. |
| High cost of connectivity | Introduction of rebates on purchase of computers and access to the internet by public libraries, schools, the elderly and low-income families. |
| Poor ICT resources and infrastructure | Deployment of broadband to ensure that the quality of connectivity is improved and to enhance wireless connectivity (i.e. Wi-Fi).<br>Improve on internet bandwidth.<br>Development of low-cost technologies through research and development (e.g. low-cost multi-vector access point for wireless access). |
| High level of inequality | Initiate projects with other stakeholders, such as installing computers in secure locations in townships, such as shops, post offices and community centres, where passers-by can access them through the building windows, thus promoting equal access for all.<br>Initiate poverty alleviation projects.<br>Instil a culture of entrepreneurship. |
| Poor physical access to ICTs (i.e. computers, internet, telephone lines) | Offer free access to computers.<br>Provide free access to the internet or at very low rates.<br>Establish internet centres/facilities to the public.<br>Provide more telephone lines to ensure sufficient bandwidth.<br>Approach organisations that have programmes to donate computers and that are prepared to cover the costs related to internet access and operator salaries. |
| Disability (physical and intellectual) | Provide favourable environment for people with physical disabilities/impairments with programmes and new technology to enable access to and use of the internet. For example, blind and visually impaired library users should have access to computers with JAWS software, a Galileo scanner, Braille printers, standard printers and the internet. Develop programmes to educate the community that computers and the internet are for everyone and not only for |

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| | |
|---|---|
| | the rich or intelligent people. This might assist in changing people's attitudes to the use of ICTs. |
| Content | Promote or address the need to offer content in local languages to the community that is being served. Provide content related to the needs of the community. |
| Legal and regulatory framework | Government to provide a regulatory framework that would enable public libraries to play a strategic role regarding education, science, technology, research, and the economic and cultural development of the country. Develop regulations that require all libraries to have an internet connection in a defined period, e.g. within five years. Introduce champions to drive the projects aimed at bridging the digital divide. |
| Age | Motivate and enable the older generation to use ICT facilities. This will assist the move towards digital inclusion. |
| Poor education or low level of education | Incorporate ICT issues in the curricula at all levels of education. Train and empower teachers on the use of ICT in the educational process. Provide schools with the necessary infrastructure. |
| Low income level | Lobby for rebates/discounts to low income earning families on purchase of computers and internet access; the government can introduce tax rebates on this as well. |
| Racial segregation | Address the imbalances of the past by providing access to all regardless of race, colour or language. Give priority to previously disadvantaged communities when providing ITC resources and infrastructure. |

## 7.4. PROPOSED MODELS FOR PUBLIC LIBRARIES TO ADDRESS THE DIGITAL DIVIDE

In investigating the role of public libraries in addressing the digital divide in South Africa and taking into account factors contributing to the digital divide, as well as potential solutions, the study proposes two models for public libraries to bridge this divide. The proposed models incorporate relevant digital divide models (Joia, 2004; Wong *et al.*, 2009), the initiatives and suggestions found in the literature review, as well as the empirical component of this study. In addition, ideas were also solicited from a proposal of IFLA to WSIS relating to information and the digital divide. As a result, two models for public libraries in bridging the digital divide are proposed: (1) a process model and (2) a stakeholder model.

### 7.4.1. Process model

Figure 7.1 illustrates the proposed process model for public libraries in addressing the digital divide. Public libraries are central to the proposed model. The model is based on findings from the literature survey and the empirical study. A report by the IFLA in response to the World Summit on Information Society (2004) on a declaration of principles from the library and information sector was also taken into consideration. The processes include positioning public libraries, developing effective management capacity building to address the issue; training and empowering staff; involving users and accessing their needs; developing appropriate policies; involving stakeholders; sourcing funding; improving ethics; building capacity; ensuring accessibility of computers and the internet; creating enabling environments; improving appropriate infrastructure; providing for appropriate content and ensuring cyber security. These processes as components of the model are explained in more detail in the next paragraphs. Addressing the digital divide is the overarching process.

**Figure 7.1: Process model for public libraries in bridging the digital divide**
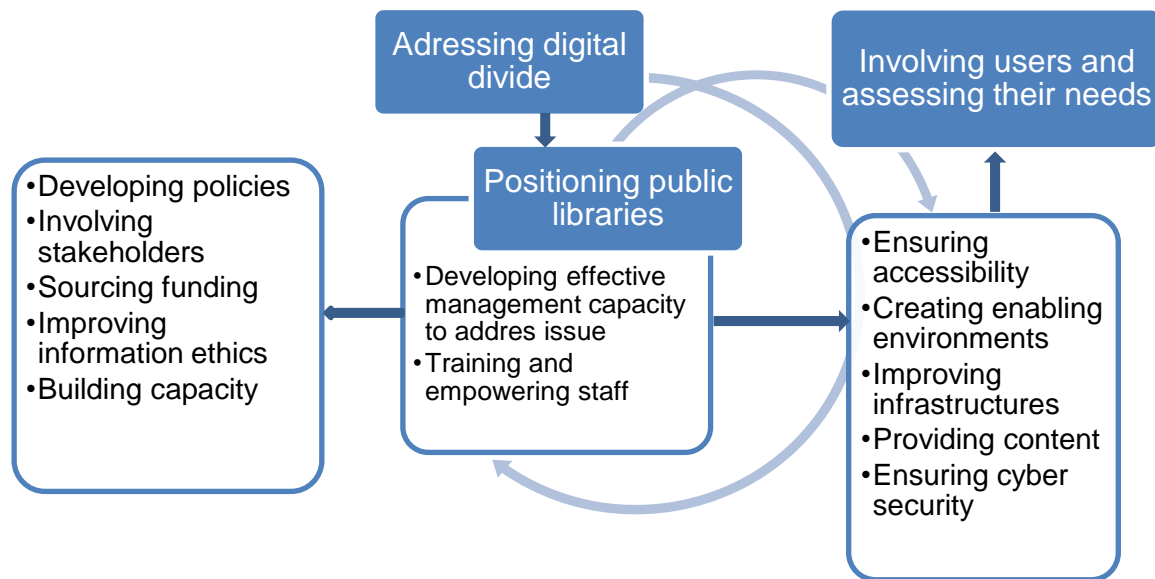


### 7.4.1.1. Positioning public libraries

Public libraries are at the centre of this model. Public libraries as role players include management and staff. In positioning themselves to bridge the digital divide, public libraries need to address all the processes noted in the model, e.g. developing policies and involving stakeholders. They especially need to address the processes of developing effective management capacity to address the issue, and the processes of training and empowering staff. Furthermore, they need to take care of the processes of involving users and assessing their needs.

### 7.4.1.2. Developing effective management capacity to address the issue

Members of management on various levels (public libraries and provincial services) need to be recruited and supported in developing the competencies and capability to respond pragmatically and strategically to issues of the digital divide and its challenges.

### 7.4.1.3. Training and empowering staff

Public library staff need to be provided with tools, training opportunities, resources, encouragement and motivation to play a role in addressing the digital divide.

### 7.4.1.4. Involving users and assessing their needs

It is essential for libraries to involve users in planning and assessing library services and products. This can be done through formal survey instruments or other regular feedback such as putting "suggestion boxes" at the circulation desk in an effort to strive for the best customer satisfaction. Efforts also need to be made to get non-users involved and to determine their needs. Considering the diversity in the South African population and the different provinces, this might require a large-scale grant-funded project.

### 7.4.1.5. Developing appropriate policies

Public libraries should develop their own policies and adhere to the parental organisation's (i.e. provincial library services) policies in addressing the digital divide. Clear policies must be formulated, defining objectives, priorities and services in relation to the local community's needs. Each public library has to be organised effectively and professional standards of operation must be maintained in bridging the digital divide.

### 7.4.1.6. Involvement of stakeholders

The involvement of all possible stakeholders, including the government, private sector, funding agencies and the user community should be sought. This was addressed in more detail in section 7.4.1.4. Section 7.4.2 presents a second model from a stakeholder point of view. Stakeholders can fulfil various roles, as explained in section 7.4.2.

### 7.4.1.7. Sourcing funding

The model proposes sourcing funding as an appropriate process. This should specifically be aimed at public/private investments in ICTs to ensure that libraries providing public access are eligible for affordable connection charges. Public libraries should identify potential donors among aid agencies, governments and private foundations.

### 7.4.1.8. Improving information ethics

The fundamental principle of the public library, that it should be open to all, underpins the strong information ethical stance of library and information professionals who embrace the fundamental values of the information society. As agents of tolerant and inclusive civil societies, public libraries should oppose exploitative, abusive and illegal use of ICTs, but ensure that any regulatory measures should not compromise the precious rights of freedom of information and freedom of expression. This is in line with IFLA's response to the WSIS (2004) on the declaration of principles from the library and information sector.

### 7.4.1.9. Building capacity

Libraries and information services should provide secure, professionally supported environments in which individuals' literacies and community capacities can be developed. Public libraries should recruit and train their staff in the use of ICTs. They should also support and develop skills for members and non-members (i.e. users and non-users) of libraries to ensure effective use of available infrastructure and achievement of empowerment. (These topics are also addressed in sections 7.4.1.2 and 7.4.1.3).

### 7.4.1.10. Improving accessibility

The model proposes improved accessibility. This refers to making personal computers and internet connections accessible to library users via their mobile phones (i.e. smartphones), tablets or laptops. Public libraries should strive to improve such access. By enabling access to information in all formats across frontiers and through time, public libraries create global information commonality, which fosters understanding and communication, creating a globally inclusive information society. The exploration of internet access using mobile technology in this regard is of special importance.

### 7.4.1.11. Creating enabling environments

Public libraries should ensure that all people will be enabled to seek and impart information. At a minimum, access to sufficient affordable bandwidth, up to date and affordable ICTs, unrestricted multilingual access to information and skills

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development programmes are required to enable everyone both to access information and disseminate their own.

### 7.4.1.12. Improving infrastructure

The model proposes that public libraries should improve their infrastructure to facilitate access to information to all people. Public libraries should do this with the assistance of their parent organisations. Infrastructure in this context refers to different types of networks (e.g. Wi-Fi, operating systems), different types of internet access (private or public, paid or free), the purchase and installation of computers, signing of maintenance contracts and the construction of premises for access (e.g. laboratories, kiosks).

### 7.4.1.13. Providing for appropriate content

Public libraries should work in many ways and at many levels to exhibit and support cultural and linguistic identity and diversity. Demonstration of cultural diversity through library holdings and programmes is particularly important to indigenous communities and in societies and nations with rich migrant traditions. In addition, public libraries can lobby for appropriate content available via internet resources.

### 7.4.1.14. Ensuring a trust framework and cyber security

According to IFLA's response to the WSIS in 2004 on the declaration of principles from the library and information sector, public libraries should ensure that there is trust and confidence between them and members of the community and that such trust is maintained in a climate of understanding, which is established through knowledge about others. The 'trust framework' and 'cyber-security' must therefore be firmly based on the principle of ensuring freedom of access to information and freedom of expression.

## 7.4.2. Stakeholder model

The second model reflects the views of the following stakeholders: government, provincial library services, public libraries, advisory committees, community partners and the community of users and non-users. Public libraries are viewed as a key stakeholder in addressing the digital divide. As seen from the study findings, public

libraries cannot function on their own; however, when addressing the digital divide, they should align their role with support from other stakeholders as reflected in the model. The interactions between different stakeholders are indicated with solid and dotted lines. A solid line with arrows on both ends means direct interaction from both parties, while a dotted line implies indirect interaction between parties. Figure 7.2 depicts the key stakeholders featuring in the proposed model, while figure 7.2 depicts the finer detail of the composition and responsibilities of each stakeholder.

**Figure 7.2: Stakeholders in a model to bridge the digital divide**

**Figure 7.3: A proposed stakeholder model for public libraries to address the digital divide**

**Government initiative through department (s)**

### National Government
**Comprising:** government and one or more departments e.g. Department of Arts and Culture, Communications

**Responsibilities:**
Legislation, policies, ICT and other strategies to address the digital divide
Take initiative for advisory committee

### Provincial Library Services
**Comprising**: directors and staff members at the headquarters

**Responsibilities:**
Development strategies to address the digital divide
Providing more funding to libraries
Developing formal policies to address digital divide
Recruiting staff with ICT, information literacy and other related skills
Training and empowering library staff to address the digital divide
Establishing ICT units
Promoting ICT use
Liaising with government, its departments, public libraries and advisory committee
Assessing success

### Advisory Committee
**Comprising:** representatives from libraries, government, user groups e.g. experts on people with disability, ICT and information literacy experts (special needs) and other stakeholders

**Responsibilities:**
Liaising with government, its departments, provincial library services and other stakeholders for their input
Advising the provincial library services on issues pertaining to the digital divide

### Community Partners
**Comprising:** schools, tertiary academic institutions, private, parastal (e.g. Eskom Foundation), non-government organisations and advocacy groups

**Responsibilities**:
Assisting in providing access to funding opportunities
Lobbying for library support in addressing the digital divide
Providing support for library resources/infrastructure
Assisting libraries in reaching new users (especially from schools and tertiary institutions)

### Public Libraries
**Comprising**: public libraries, their heads and staff

**Responsibilities:**
Accept and support provincial library services' strategies
Lobby for more funding through professional bodies e.g. LIASA
Develop sub-strategies for addressing the digital divide
Empower library users and non-users
Offer more ICT and IL training for users and non-users
Increase access to computers and the internet
Establish ICT infrastructure, especially ICT support units
Undertake library promotion and marketing and develop websites
Create a favourable environment for people with special needs
Develop websites

### Community of Library Users and Non-Users
*No assigned responsibilities*
Communicate their expectations and satisfaction/ dissatisfaction to libraries and demonstrate willingness and commitment to learn and try things
Encourage library use within the community

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All components of the proposed model will be discussed in more detail in the next section.

### 7.4.2.1. National government

National government is the highest authority in governing public libraries. It comprises the government and one or more departments to which provincial library services report. The model proposes the following responsibilities of the government: developing legislation, policies, ICT strategies and other strategies to address the digital divide. The government should continue to fund and provide support to public libraries through its departments. In South Africa this will be the Department of Arts and Culture. Other departments might also be involved, for example the Department of Communication to develop policies for ICT adoption, such as a broadband policy. The government should also take the initiative for establishing an advisory committee to provincial library services.

### 7.4.2.2. Provincial library services

Provincial library services are the controlling body of public libraries in South Africa. Their personnel comprise directors and staff members at the headquarters. In South Africa there are nine provinces. The model proposes the following responsibilities of the provincial library services: development of strategies to address the digital divide, provision of more funding to libraries, and development of formal policies to address the digital divide. They should also recruit staff with ICT, information literacy and other related skills. Provincial library services should provide training and empowerment of library staff to address the digital divide. Provincial library services should establish ICT units for technical support and maintenance, promote ICT use, liaise with government, its departments, public libraries and the advisory committee. Finally, they need to develop measures to assess successes.

### 7.4.2.3. Advisory committee

The model proposes the establishment of an advisory committee. It should consist of representatives from libraries, government, user groups, e.g. experts on people with disabilities, ICT experts, information literacy experts (special needs) and other stakeholders. Its responsibilities should be to advise the provincial library services on

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issues pertaining to the digital divide. The committee should liaise with government, its departments, provincial library services and other stakeholders.

### 7.4.2.4. Public libraries

Public libraries are core participants in the study. They encompass public libraries, their heads and staff. The responsibilities of public libraries should be to accept and support provincial library services' strategies, lobby for more funding and support through their line functions and also through professional associations such as the Library and Information Association of South Africa (LIASA), to develop sub-strategies for addressing the digital divide. They should empower library users and non-users, offer more ICT and information literacy training for users and non-users, and improve access to computers and the internet. Libraries should also establish ICT infrastructure, especially ICT support units. Public libraries can organise campaigns aimed at promoting and raising awareness of the use of ICT at libraries and its potential benefits, thus increasing acceptance levels of ICTs, enhancing the use of ICTs, increasing understanding of ICTs and helping build positive attitudes to ICT. This can also help to address the attitudinal factor contributing to the digital divide identified in Chapter 2 (section 2.5). Public libraries should also develop their own websites to ensure that they can provide online library and information services. They should create favourable environments for people with special needs by ensuring that they have assistive technologies and create easy access to their buildings for these groups. It is essential that public libraries have a very clear understanding of what the digital divide is about.

### 7.4.2.5. Community partners

Community partners are schools, tertiary academic institutions, private, parastal (e.g. Eskom Foundation) and non-governmental organisations and advocacy groups. Their responsibilities should be to assist in providing access to funding opportunities, lobby for library support in addressing the digital divide, provide support for library resources/infrastructure and assist libraries in reaching new users (especially from schools and tertiary institutions). It is essential that public libraries strengthen or nurture these partnerships in their effort to address the digital divide. Such partnerships should perhaps be formalised in the form of agreements.

*7.4.2.6. Community of library users and non-users*

This group of users and non-users have no assigned responsibilities; however, they could play a crucial role by communicating their expectations and satisfaction/dissatisfaction to libraries and demonstrate willingness and commitment to learn and do things. They could encourage library use in the community.

## 7.5. STRENGTHENING AND CONTEXTUALISING THE MODEL FROM THEORETICAL PERSPECTIVES

Chapter 2 (section 2.2) noted various theories that have been aligned to studies and attempts to address the digital divide. Such theories might provide researchers with guidance on understanding the implications of the gaps causing the digital divide (Mason & Hacker, 2003) or frameworks to categorise approaches to analyse the nature of the digital divide (Hilbert, 2011). Although acknowledging the importance of such guidance and frameworks (section 6.4), this study opted for a more pragmatic approach to explore diverse issues. Findings on these issues informed the proposed model. The model might, however, be further strengthened and contextualised by showing how such theories can direct further research and interventions such as ICT and information literacy training.

Theories that stood out from a review of the literature include:

- Theories related to communication and adoption of innovations, communication theory, diffusion of innovations theory, network society and consumption theory;
- Theories related to social cognitive issues;
- Theory of information ethics;
- Theory of information poverty;
- Theory of justice;
- Theory of social capital.

Further consideration of these theories might contribute to strengthening the model; the intention here is not to argue any one as more important than others.

In Table 7.2 some key issues noted from the findings of the study are aligned to the theories that might deepen insight into the issue and need to be considered in future work, policies and interventions. This is not intended as a comprehensive list.

**Table 7.2: Issues noted from findings and theories**

| Issues | Theories |
|---|---|
| Dimensions of the digital divide (e.g. digital divide between individual, countries), factors contributing to the digital divide (e.g. income, age etc.) | Diffusion of innovation theory, Information ethics |
| Lack of local content | Information ethics theory |
| Poor access to ICTs | Information poverty theory |
| Lack of funds or budgets cuts, low income level, high level of inequality | Theory of justice |
| Lack of ICT strategies, poor ICT resources and infrastructure | Structuration theory, adaptive structuration theory |
| High cost of connectivity | Consumption theory |
| Lack of training | Self-efficacy theory, Castell's theory of network society, social capital theory |

Each theory or group of theories will be briefly explained in terms of how it can support further work (theoretical as well as practical) on the role of public libraries in addressing the digital divide.

The digital divide is not just about having ICTs and having access, but also about acceptance of ICT. Theories related to communication and the adoption of innovation and the diffusion of innovation are explored in the work of Hilbert (2011), Mason and Hacker (2003) and Zhang (2013). The essence of these theories is that those with more resources adopt technologies first and that new interactive technologies create knowledge gaps. These theories can be used in studying ways in which public libraries can increase access to computers and the internet to further enhance their plans and initiatives and to inform future policies. In addition, Castell's concept of a network society can inform on the crucial nature of IT access and skills

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for participation in the social formations that are rapidly changing from offline to hybrids between offline and online organisation and work (Mason & Hacker, 2003).

Communication and consumption theory has been discussed by Hecht (1993), Hecht, Hecht, Jackson and Ribeau (2003) (as cited in Jung & Hecht, 2004) and Zhang (2013). Communication theory can add value in determining how provincial library services can improve their communication with government departments, public libraries and an advisory board as well as the wider public. The consumption theory as suggested by Hecht (1993) might provide insight into how public libraries can market and promote their product and services and develop a website.

The value of the theory of self-efficacy and structuration theory in addressing the digital divide has been noted by Bandura (1997), Broos and Roe (2006), Compeau *et al*. (1999), Easton and LaRose (2000), Harrison *et al.* (1997), Mason and Hacker (2003), Oppong (2014), Wood and Banfuar (1989). These theories can deepen insight into understanding the necessary training to be provided to library staff on addressing the digital divide.

The information ethics theory as proposed by Luciano Floridi also features in the work of Hongladarom (2004). This theory can shed light on how best provincial library services and public libraries can empower library staff and users. It can also address concerns about the lack of local content and the dimensions of the digital divide.

The information poverty theory of Chatman (1996), as discussed by Hersberger (2002), can sensitise policy makers and the providers of services such as public libraries to develop relevant strategies and policies to address the digital divide.

The theory of justice, as proposed by Rawls, has been noted in the work of Hendrix (2005). This theory can be used to investigate ways in which public libraries can establish ICT support units and provide access to computers and the internet. Lastly, the theory can shed light on how a community of partners can lobby for more funding for public libraries.

The theories of social capital and social and cultural reproduction were noted in the work of Bourdieu (1984), Chen (2013), DiMaggio *et al.* (2001), Fuchs (2008), Kraut *et al.* (2008), Kvasny and Keil (2006). These theories can be used to gain understanding of how a community of library users and non-users can communicate their expectations and satisfaction or dissatisfaction to libraries and demonstrate willingness and commitment to learn and try things and encourage library use in the community.

## 7.6. CONCLUSION

Based on data presented and interpreted in Chapter 5 and other relevant literature presented in chapter 6, this chapter proposed a model for public libraries to bridge the digital divide in South Africa.

The chapter highlighted a number of factor categories contributing to the digital divide and challenges faced by public libraries that need to be considered in the proposed model. The chapter also outlined potential solutions as derived from actions and efforts that have been reported in the literature and the empirical work from this study.

Although the proposed model is based on the South African situation, it can also be adapted and applied by other countries. Most of the factors and challenges noted are similar to what is found in many countries, therefore recommendations from this study can also be considered in other countries.

The next chapter presents the findings and recommendations based on these findings. Some of the essence of the model is also explained in Chapter 7.

# CHAPTER EIGHT: FINDINGS, RECOMMENDATIONS AND FUTURE RESEARCH

## 8.1. INTRODUCTION

This chapter presents the findings and recommendations of this study. The aim of this study was to investigate the role of public libraries in South Africa in bridging the digital divide. The chapter presents a summary of the findings, based on the problem statement and sub-problem outlined in Chapter 1 (section 1.5). It will also cover recommendations of this study, including recommendations for further research.

The central research problem for this study focuses on the question of what role public libraries in South Africa can play in bridging the digital divide and how they can do this. The central research problem was further addressed by asking the following questions:

- What is the scope and implications of the digital divide? (These include the meaning of the concept, the dimensions and the factors leading to the digital divide.)
- What has been reported on the role of libraries (including information services) in bridging the digital divide?
- What have libraries in South Africa done to address the digital divide, and which possibilities are foreseen?
- How should South African libraries be positioned to contribute to bridging the digital divide?

The findings of this study are based on data collected from various sources, including a literature review on the concept of the digital divide (Chapter 2) and on the role of public libraries in bridging the digital divide (Chapter 3). In the South African context, empirical data were collected using:

- Interviews with directors of provincial library services in South Africa;

- A questionnaire sent to a representative staff member of participating public libraries in Gauteng, Limpopo and KwaZulu-Natal (all were invited to participate);
- Interviews with selected heads/representatives of public libraries in Gauteng, Limpopo and KwaZulu-Natal.

Findings for each sub-question are summarised in the following sections.

## 8.2. FINDINGS ON PRINCIPAL AND SUB-QUESTIONS

This section briefly presents the findings of this study in relation to each research sub-question. Each question will be addressed individually, based on the results of this study.

### 8.2.1. Sub-question 1: What is the scope and implications of the digital divide? (These include the meaning of the concept, the dimensions and the factors leading to the digital divide.)

A clarification of the concept of the digital divide and different interpretations were provided. This assisted in understanding the concept and establishing its meaning in terms of this study. This sub-question was answered through a literature review. Authors such as Cullen (2003), Ani, Unchendu and Atsye (2007), Chen and Wellman (2003), Gorski (2001), and Samara (2005) defined the concept of digital divide as a gap that exists between those who have and those who do not have access to ICTs; as a result it creates inequalities in access to ICTs between those two groups.

A number of dimensions were identified. Adeogun (2003), Ani, Uchendu and Atseye (2007), Alsa, Williamson and Mills (2006), Fink and Kenny (2003), Guomundsdottir (2005), Millard (2003), Pigato (2001), Kibaya (2005), Riley (2004) and Sandor (2005) found that there are different dimensions of the concept of the digital divide. These dimensions were discussed in detail in Chapter 2 (section 2.3) as follows: global divide, which refers to disparities in

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access to and use of ICTs between countries, social/domestic divide, which refers to where the connectivity and use of digital technology varies within a nation, grey divide, which refers to the digital divide between the young and elderly people and the democratic divide, which refers to differences within the online community of users who either choose to use technology or not, to engage, mobilise, and participate in public life.

In order to formulate an operational definition for the purposes of the study, key factors contributing to the digital divide noted in the literature review (Chapter 2; section 2.4) were considered, namely inadequate access to computers, the internet and even ICTs such as telephones; inadequate ICT and information skills, including computer and internet skills; low levels of education; poverty; limited skills in the languages in which most information is available; inequalities in access and opportunities based on racial and ethnic profiles; inadequate provision for people with disabilities; lack of content appropriate to people's needs and abilities in terms of language and reading skills.

In this study, the concept of digital divide is thus defined as the gap between people who have access to ICT tools such as computers and the internet and those who do not have access to these and/or do not have the capability and the skill to use such tools. The digital divide can occur between men and women (domestic divide), between the young and the elderly (grey divide) and between different countries/regions (global divide). The digital divide presents different phenomena: first, inequality in computer and internet access, secondly unequal ability to use computers and the internet, thirdly unequal access to information and information-related interaction. This might be due to many factors (such as education, language, income, lack of skills, etc.). The concept highlights the issue that those who do not have access to such technologies, skills and information will be disadvantaged in participating in the knowledge economy.

## 8.2.2. Sub-question 2: What has been reported on the role of libraries (including information services) in bridging the digital divide?

This sub-question was also answered by means of a literature review. Reports noted a number of attempts to bridge the digital divide. Those attempts were made by different countries, *inter alia* Australia, Brazil, China, India, Namibia, Mexico, Slovenia, Egypt, Cyprus, Germany, Italy, Hungary, Lithunia, the Netherlands, Portugal, Slovakia, South Africa, Cape Verde, the United States of America, Botswana, Chile, Poland, Canada, Algeria, Argentina, Columbia, Bangladesh and Malaysia. The literature review found that public libraries can play a role in addressing the digital divide. It was learnt that public libraries are viewed as places and institutions of significant value to their communities (Berryman, 2004; Gomez, 2012; O'Brien, 2010), and are seen as a possible solution to challenges concerning access to information (Gomez, 2012; Rahman, 2007).

It was found from the literature that public libraries have a major role to play in bridging the digital divide (Bishop *et al.,* 1999; Chisenga, 2004; Clark & Gomez, 2012; Ghosh, 2005; Moahi, 2003; O'Brien, 2010; Rahman, 2007; Russel & Huang, 2009; Singh, 2007). Opinions expressed on the role of public libraries in bridging the digital divide include the following:

- **Providing access**: Providing access to ICTs such as computers and the internet for those who do not have such facilities.
- **Offering information literacy and ICT literacy programmes**:Training people to be able to access and use information as well as ICTs.
- **Information provision**: Providing information to all in order to reduce the gap between those who have the facilities to access digital information and those who do not.
- **Acting as gateway to equal access:** Providing communities with equal free access to internet-equipped computers, software, databases and assistance in this regard.

- **Developing outreach programmes:** Reaching out and spreading ICTs to those who may not have online access.

- **Supporting, facilitating and promoting information exchange and communication between citizens and the government**: Public libraries should play a role in providing information services to communities through the use of electronic technologies including computers and the internet, etc.

- **Establishing partnerships and collaboration:** This should involve the private sector, schools, community centres, non-governmental organisations, etc.

- **Implementing digital library services:** Examples are subject gateways, digital reference services, free access to e-journals and e-books in many areas, e-print archives and free digital libraries.

Public libraries, however, face many challenges, namely budget cuts, inadequate funding, staff shortages, lack of training in the use of ICTs and offering information literacy programmes, lack of ICT strategies, inadequate physical space to accommodate users, lack of ICT maintenance support, lack of government support, high cost of connectivity, security (theft of equipment) and lack of skills in using ICTs such as computers and the internet.

## 8.2.3. Sub-question 3: What have libraries in South Africa done to address the digital divide, and which possibilities are foreseen?

This question was answered by the empirical study. The first part of this section will provide findings from the provincial library services and the second part will focus on findings from public libraries.

### 8.2.3.1. Provincial library services

Although provincial library services, which are the controlling bodies of public libraries in South Africa, have documents containing information on their mission and vision, their mission and vision statements do not explicitly address the

digital divide or shed any light in this regard. Their aims are to support public libraries to provide information resources, services to communities and access to information through ICT via targeted fund transfers to municipalities. The provincial library services also facilitate implementation, monitoring and evaluation of policies and guidelines. Although they strive to provide all these services, this does not seem to be sufficient, as most public libraries are still not well equipped with technology and do not have sufficient funds.

The provincial library services participating in the study did not have an explicit policy and strategies aligned to their vision and mission to guide and enable them in addressing the digital divide. This is a serious concern, as most of their initiatives are undertaken on a random or an *ad hoc* basis without any guidelines from the policy or strategic plan. The lack of ICT strategies that are aligned with policy implies that ICT deployment is not formalised. There are no guidelines on the acquisition and deployment of computers at public libraries. As a result, in some provinces public libraries have more ICT resources while others have limited resources. Some provincial library services indicated that they were not aware of any digital divide projects initiated by their public libraries. This illustrates lack of communication between public libraries and their controlling bodies, the provincial library services, and also lack of strategic plans and policies in addressing the digital divide. Provincial library services set no obligation on public libraries to implement their plans.

Strategic documentation such as strategic plans, annual performance plans and annual reports showed a focus on addressing the digital divide, e.g. establishing and maintaining ICTs in public libraries, training librarians on the use of ICTs, providing infrastructure required for public library services (i.e. physical buildings and ICTs), installation of internet services in public libraries, provision of computers, provision of funding for building, ICTs and staff. However, achievement of such plans was still limited at the time of data collection. Furthermore, provincial library services were not addressing all the factors that

influence the digital divide and challenges faced in addressing it. Examples of such factors and challenges that were not addressed are attitudinal barriers, physical disabilities, language, staff shortage and lack of ICT strategies. However, the following factors and challenges were noted and addressed: lack of funds, lack of physical space and lack of training. A lot of work still needs to be done in addressing the digital divide, especially in rural areas.

Although all provincial library services included in the study had access to computer facilities in their headquarters, there are still disparities in the number of computer facilities available. For example, at the time of the study there were provincial library services with only ten computers at their headquarters, while there were others with more than 100 computers available at their headquarters. Internet access is available in all provincial library services, but it is limited to the number of computers connected to network points.

It was also found that none of the provincial library services had its own website at the time of the study. They depended on the websites of their parent organisations. Even when rechecked in June 2015, there is no website. The value that a library website can have in internet based information provision and addressing the digital divide is thus not exploited.

All provincial library services provided ICT training to their staff members at their headquarters. Very few of them provided such training to staff members in public libraries. Information literacy training was also provided by some provincial library services to their staff at headquarters and to staff in public libraries. The training was, however, still patchy and more should be done to improve it. In most cases it appears as if public libraries are left with the responsibility to arrange training with their limited budgets and human capacity. Limited statistics are kept on training programmes provided to staff of public libraries and library users. This raised serious concern, as it was difficult to obtain statistics on the number of ICT users.

The study found that very few provincial library services had IT units/departments charged with the responsibility of taking care of ICT facilities. They depended on external ICT service providers or the IT departments of their parent organisation to maintain the library's ICT infrastructure. This was not efficient, as they had to share their support with other units in their parent department, which might hamper their turnaround time in addressing ICT support issues.

Although future plans, such as providing ICT and information literacy training to their staff and community, continuing to maintain ICT infrastructure in public libraries, procuring more computers and connecting public libraries with the internet, were noted, a concern is the actual implementation, which is hampered by lack of formal policy and formal accountability prescribed by provincial library services. As a result, implementation of the plans is often too slow. Some of the factors contributing to the delay in implementation are budgetary constraints and in a few cases political intervention.

The biggest challenges, apart from lack of policy, include inadequate budgets to fund public libraries in their projects to address the digital divide, slow progress in providing connectivity to public libraries because of high costs involved, theft of computers and other ICT resources, poor staff retention, especially regarding expertise in ICTs, and lack of staff with ICT skills. Lack of ICT and information literacy training programmes for staff and users is another challenge hampering provincial library services.

In follow-up surveys of limited scope with the three key participating provincial library services (Gauteng, KwaZulu-Natal and Limpopo) in October 2015, the directors were asked to comment on the impact of mobile smartphones on their services. It was found that mobile phones had an impact on their services. The provincial library services are thus focusing their services on the youth, providing them with educational support material and services, providing access to the internet, social networking facilities, recreation and a comfortable and safe

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community hub in which to study and socialise. They also indicated that public libraries implemented a number of interventions, such as installing Wi-Fi technologies and introducing some of their services through Apps; however, delays in appointing service providers for the latter often hamper their plans.

*8.2.3.2. Public libraries*

This section summarises findings from public libraries. Provincial library services have an impact on public libraries, as they are the controlling bodies and public libraries depend heavily on resources from provincial library services.

Almost all public libraries that participated in the study do not have a website. The provision of library information services via the Web is thus very limited. In public libraries with their own websites, only their OPAC and facilities for renewing items checked out from the library and facilities for requesting materials on inter-library loan are found on the websites.

Although most public libraries have computers available for use by library staff and the public, this does not apply to all. Some public libraries have only one or two computers available, while others have 30 to 60 computers. This poses a serious disparity in terms of computer availability. Worth noting is that at the time of data collection many participating public libraries had started purchasing computers and had plans to purchase more.

Internet connectivity is available in most public libraries and some are providing internet access to their library users. It must be noted that the availability of computers and access to the internet in some provinces are very limited, leaving great disparities in the level of access to the internet. Although most public libraries have been providing internet access to their staff, library members and non-library members for a period of more than four years, progress with providing access to the internet is still slow. Many public libraries are providing access to the internet free of charge.

A significant number of public library representatives did not understand what the digital divide was about. This made it difficult for them to share their opinion on the matter. Although they had no idea of what the digital divide is, they had intuitively been making some attempts to address the problem, e.g. provision of computers and training on ICTs. Similar to provincial library services, most public libraries do not have an explicit policy on bridging the digital divide. Thus there is nothing to guide and enable them to address the issues of the digital divide.

Many initiatives were noted, e.g. providing internet services, providing access to the internet free of charge, working with local schools and other agencies to bring technology to the people through mobile libraries, training people on how to use computers, the internet and other technologies, purchasing more computers and securing funding to implement other ICT projects. Although public libraries could report initiatives, they are still battling to see these plans through. They especially still need more support and guidance from their controlling bodies, i.e. provincial library services, national government, donors, etc. The achievements of public libraries are more notable in libraries situated in the cities, suburban areas and some townships. There are mostly limited achievements in public libraries that are situated in the rural areas.

Overall, inadequate funding and budgets for ICTs, lack of government support (especially from parent organisations), inadequate physical space to provide facilities for internet access, a shortage of staff with ICT expertise and skills, difficulties in training library staff in appropriate ICT skills, lack of strategies to guide and enable them to implement their plans in addressing the digital divide and lack of ICT strategies to enable them to deploy ICTs in their libraries are major challenges for public libraries in their effort to address the digital divide. As a result of these challenges, many public libraries in South Africa have not taken advantage of opportunities that ICT can offer in addressing the digital divide. Although public libraries in South Africa are benefitting from funding provided by

national, provincial and local governments, such funding does not seem to be sufficient for them to achieve all their objectives. Many are now forced to depend on external funding for their ICT projects.

Most of the public libraries that participated in the study have plans to address the digital divide in the future. Table 8.1 presents a comparison of plans and achievements of provincial library services and public libraries.

**Table 8.1: Comparison of plans and achievements of provincial library services and public libraries**

| Provincial library services | | Public libraries | |
|---|---|---|---|
| **Plans** | **Achievements** | **Plans** | **Achievements** |
| Maintenance of the ICT infrastructure in public libraries. | Ongoing support is provided to public libraries to maintain their ICT resources. This support is provided through minimal funding, which is inadequate. | None noted. | None noted. |
| ICT and information literacy training for the staff and community. | Limited training on ICT and information literacy has been offered to library staff and users. | Providing more training. | Training of people on how to use computers, the internet and other technologies involved. Provision of information literacy training. |
| Procurement of more computers. | Many public libraries have been supplied with computers through various projects e.g. a conditional grant by the Department of Arts and Culture. | Acquiring more computers. | Most public libraries are purchasing more computers. |
| Connecting public libraries with the internet. | Substantial number of public libraries has been connected to the internet. | Connecting library computers to internet. | Most libraries are providing internet access to both staff and users. Some libraries are providing free internet access to library users. |
| Continuous collaboration with the National Library of South Africa on provision of computers to public libraries. | Many public libraries work closely with the National Library of South Africa; this is a continuous relationship. | Collaborating with schools, communities and other stakeholders. | Working with schools and other agencies to bring technology to the people (community). |

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| Introduction of an online public access system that links public libraries and schools and enables scholars to view the contents of the public library system (OPAC). | Most libraries have an OPAC system, but they still do not link to local schools. | Automating libraries. | Most public libraries have introduced an OPAC system. A few still use manual library systems, since they do not have websites. |
|---|---|---|---|
| Allocate more funding to new library buildings, collection development, ICT and staffing of new public libraries. | Funding has been provided to public libraries, but there are not many new buildings for libraries. Most projects are only the refurbishment of existing libraries. Staffing is still an issue; there is still a shortage of staff, especially with ICT skills. Public libraries are purchasing more library materials either in hard copy or electronic format. In some instances this is done through consortiums. | Expanding the library space. | Some libraries succeeded in expanding their spaces and refurbishment has also been done. However, the number of new buildings is relatively low. |
| None noted. | None noted. | Outreach and promotional services. | Most public libraries are providing mobile services to people who are unable to visit the library. Creating public awareness of capabilities and opportunities that can be offered by using ICTs. |
| None noted. | None noted. | Launching more ICT projects. | Very few public libraries have launched ICT projects. |

The study found that some public libraries are making efforts to offer training to library staff, library members and sometimes non-members. Public libraries have good awareness of what needs to be done, but they still struggle to deal with the implementation of training programmes. They consider the following as types of training necessary for library users: internet searching, computer literacy, information literacy, use of social networks, database searching and multimedia tools. Although the training of library staff and library users on how to use ICTs is somewhat patchy, public libraries indicated the following as their training

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initiatives: use of internet facilities, use of library facilities by community members, general computer use, information literacy and use of social network tools.

### 8.2.4. Sub-question 4: How should a theoretical model look for South African libraries to contribute to bridging the digital divide?

Chapter 6 proposed and discussed the models for public libraries to address the digital divide. The proposed model incorporates the initiatives and suggestions found in the literature review, as well as the empirical component of this study. The model also reflects the views of the following stakeholders: government, provincial library services, public libraries, advisory committee, community partners and the community of users and non-users. Public libraries are viewed as key stakeholders in addressing the digital divide. The model further describes the composition of each stakeholder and proposes the responsibilities of each stakeholder.

In order to contextualise findings from the study against theories related to the digital divide, the following theories were discussed in Chapter 2 (section 2.2): theories related to communication and adoption of innovations, communication theory, diffusion of innovations theory, network society and consumption theory, theories related to social cognitive issues, theory of information ethics, theory of information poverty, theory of justice.

### 8.3. RECOMMENDATIONS

The aim of this study was to investigate the role South African libraries can play in bridging the digital divide and to propose the theoretical model for public libraries to address the digital divide. Based on the findings the study makes the following recommendations:

### 8.3.1. Strategy for bridging the digital divide

Given the current status of the digital divide, this study recommends that provincial library services develop a formal strategy for bridging this divide. Such a strategy should receive input from the affiliated libraries and relevant stakeholders such as provincial and national government, marginalised groups such as people with disabilities etc. Moreover, this must have government endorsement and support. The study further recommends that, based on the strategy from the controlling body, public libraries should develop sub-strategies to address the digital divide in South Africa. It would also be essential to have cooperation between all provincial library services. This will reduce working in silos and re-inventing the wheel.

### 8.3.2. Policy for bridging the digital divide

Libraries need strategic plans that align with their policies and they should strive to plan at least three to five years ahead and to set strategic goals and objectives that must be achieved. Taking into account the lack of explicit policy on bridging the digital divide by provincial library services and public libraries in South Africa, this study recommends the development of a policy on bridging this divide. This policy should be in line with the broadband policy that was gazetted by South Africa's Department of Communications on 13 July 2010. For South Africa it is very important to ensure that the policy is in line with global trends to meet the diverse needs of people. An official policy must be at the level of the provincial library services and a sub-level policy tailor-made for individual public libraries. Public libraries should be held accountable for implementing such policies. Some of the theories as noted in Chapter 6 (section 6.5) can assist policy makers to inform future policies.

### 8.3.3. Advisory committee for bridging the digital divide

The study recommends the establishment of an advisory committee focusing on advising provincial library services on issues pertaining to the digital divide. The forum should be composed of public representatives (preferably community

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leaders), marginalised groups such as people with disabilities, partners (i.e. schools, government, non-governmental organisations, private sector) and members of the Systems Librarian Forum operating under the auspices of the Department of Arts and Culture. The reason for including the systems librarians is that their role involves responsibility for managing information technology used in libraries. Their position combines principles of librarianship with computing technology.

### 8.3.4. Collaborative approach to addressing the digital divide

In addition to the advisory committee and taking into account the complexity and dimensions of the digital divide, the study recommends that public libraries collaborate with relevant partners in their effort to address the digital divide. In this instance, public libraries should collaborate with provincial library services, municipalities, private businesses, non-governmental organisations, local communities, other funding agencies, academic institutions and government departments, e.g. the Departments of Information Science and Departments of Education. These institutions can assist in developing coordinated, long-term, effective projects/programmes to reduce the digital divide. They will also have to ensure that their curriculum equips students with skills to provide solutions in addressing the digital divide.

### 8.3.5. Soliciting funding for ICT

Lack of funding has been reported by all provincial library services and public libraries as a major challenge. Though public libraries in South Africa are funded through a conditional grant (this is funding that is provided by the Department of Arts and Culture in collaboration with provincial Departments of Arts and Culture), this funding is not sufficient to enable them to meet their needs. There is a need to increase funding through participation in other opportunities and diversifying sources of funding. There must be more efforts to lobby, and to obtain funding from other resources. They should identify other funding bodies. The concern is that if people are unable to participate in the digital era and global economy, the

digital divide is not addressed and this might have an impact on the economy nationally.

### 8.3.6. Use of the Web

Provincial library services and public libraries must make use of the Web in the provision of information services to their users. This can be done by developing their own library website to provide information and internet-based library and information services, such as online community information resources. A website can also be used to market library services, provide training to library members (training schedules could be reflected in the library website), access to electronic databases, online reservations and renewal of library materials, links to free digital libraries and online reference librarian services (such as "Ask a librarian") etc.

### 8.3.7. Developing and implementing training programmes on ICT

A lack of library staff with ICT skills or expertise has been reported as one of the challenges faced by both provincial library services and public libraries. Intense training should start with library staff in order to transfer skills to the public. Public libraries should therefore develop formal training programmes for library staff and users on the use of ICTs. These training programmes must be developed according to the current needs and trends. Effective implementation of training programmes might ensure that library staff is equipped with appropriate skills to offer online library and information services. Training on teaching skills for librarians is essential in order to ensure that they transfer the skills to library users.

### 8.3.8. Dedicated ICT support

As reported in this study, few provincial library services and public libraries have IT departments or units that can attend to their ICT-related problems. The study recommends the establishment of IT departments/units in public libraries with

support staff dedicated to deal with ICT support issues. If this is not feasible, there should at least be support from headquarters.

### 8.3.9. Promotion and awareness campaigns

Public libraries should exploit opportunities offered by ICTs and identify unique services such as internet-based library and information services that can be marketed to their library users and the general public. If ICT infrastructure and training opportunities can be established as explained in section 8.3.7, public libraries should focus on marketing. The value of marketing the public library is promotion of digital information resources, ensuring optimum use of internet-based library and information services, improving the image and status of the library and attracting people who might not be using libraries. Such marketing plans should focus on services strongly linked to addressing the digital divide.

### 8.3.10. Providing easy access to individuals with disabilities and the elderly

Public libraries should provide a favourable environment for people with physical disabilities/impairments by ensuring that they have programmes and assistive technologies to enable them to access and use the internet and other ICT. Such adaptation should also be extended to elderly people by encouraging and training them to use ICTs in public libraries. Library buildings should be designed in such a manner that they ensure access for people with disabilities and must comply with standards for physical disabilities and other related legislation.

### 8.3.11. Applying theories related to the digital divide

There is a need to consider applying digital divide theories to address the digital divide. Such theories might be applied to the issue of the digital divide in an attempt to provide researchers with a useful guide to understand the implications of the digital divide and to provide possible solutions to address it.

## 8.4. SUGGESTIONS FOR FUTURE RESEARCH

This study aimed at investigating the role of public libraries in bridging the digital divide in South Africa. The study further proposed a model for public libraries to address the digital divide in South Africa. Aspects that have not been addressed in this study require further research regarding the digital divide in South Africa.

- This study did not cover all public libraries in the nine provinces in South Africa (only seven provincial library services participated in the study) and only public libraries from three provinces participated. Therefore, studying the role of public libraries in the other provinces is essential.

- This study only examined the views of directors of provincial library services and heads/representatives of public libraries. It might be insightful to understand the factors that contribute to the digital divide within the community and the role of the public libraries in addressing the digital divide as understood by the community. Views from the community can be used to find further solutions to address the digital divide and the contribution that the community is prepared to offer.

- Although a lot has been reported on the role of the government in helping public libraries to address the digital divide, interest and contributions from the private sector need to be explored. A future study is needed to address this aspect.

- Policies on various levels, starting with national, provincial and local/municipal governments, must be examined. Policies have huge implications for addressing the digital divide. A study must be conducted to investigate the implications of government ICT policies and legislation for public libraries.

- A study on the role of information professionals to increase information literacy and to decrease the digital divide in the communities they serve is required. Such research should also focus on information literacy skills on various levels, e.g. basic reading skills, using digital content, health information literacy, skills in using ICTs as responsible citizens and

workplace information literacy. The researcher should be familiar with theories such as communication and adoption of innovations, communication theory, diffusion of innovations theory, network society and consumption theory and others, as discussed in Chapter 2 (section 2.2) and Chapter 7 (section 7.5).

- A study on the impact of the digital divide on users, non-users and other people is necessary. Such user studies should follow from the different provinces in South Africa with consideration of a full spectrum of users and non-users including those who do not have access to ICT, those who lack skills, and especially elderly and disabled people.

- It will also be essential to conduct a study on the role of government, private/community partners and academia in addressing the digital divide.

## 8.5. CONCLUSIONS

This chapter presented the findings based on the problem statement and sub-problems that were outlined in Chapter 1 (section 1.5). Based on the findings, the chapter also made recommendations that will help public libraries in addressing the digital divide in South Africa. Suggestions for future relevant research were also outlined.

In conclusion it can be said that it is essential for public libraries to have a full understanding of the concept of the digital divide. The study also indicated that it is important to have partners in the effort to address the digital divide rather than working in silos.

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# APPENDIX A: INTERVIEW SCHEDULE FOR DIRECTORS OF PROVINCIAL LIBRARY SERVICES

**Questions for a semi-structured interview with the directors of the provincial library services in order to obtain authentic data from the controlling body of public libraries in each province**

The purpose of the interview is to collect data as part of a study conducted by Mr Hamilton Mphidi for his D Phil degree in Information Science in the Department of Information Science, University of Pretoria. My personal details are: mphidimh@tut.ac.za, Tel: 012 382 4910, Cell: 083 282 1332. My supervisor for this study is Prof Ina Fourie: ina.fourie@up.ac.za, Tel: 012 420 5216, Cell: 082 707 8062. We will greatly appreciate your participation and look forward to sharing the results of the study with you.

*The researcher and possibly an assistant will take brief notes during the interviews.*

## A. General institutional information

1. Province

| Gauteng | Limpopo | North-West | Mpumalanga | Eastern Cape | Western Cape | Northern Cape | Free State | KwaZulu-Natal |
|---------|---------|------------|------------|--------------|--------------|---------------|------------|---------------|
|         |         |            |            |              |              |               |            |               |

2. How many public libraries are affiliated to your provincial library service?

3. Are there any documents that contain information on the vision and mission of the provincial library service? If available, will you share these with us?

4. Are there any documents on the functions of the provincial library service? If available, will you share these with us?

5. Is any statistical information available on the use of the public libraries in the province? If so, will you share this with us?

6. Are there any other documents or information that might shed light on the issue of the digital divide and how it affects the provincial library service? If so, will you share these with us?

**B. ICT infrastructure**

7. How many computers does the provincial library service have for use by the following?

(a) Staff at headquarters

(b) Other (please specify).

8. How many of the computers are connected to the internet?

9. Does the provincial library service have a website?

10. Does the provincial library service provide ICT training to the following?

a) Staff from headquarters

b) Staff from affiliated public libraries

c) Public.

11. Does the provincial library service provide information literacy training to the following?

a) Staff from headquarters

b) Staff from affiliated public libraries

c) Public.

12. Does the provincial library service have its own ICT unit and/or supporting infrastructure?

## C. Provincial library services and the digital divide

13. What is your personal opinion on the digital divide?

14. Does the provincial library service have a policy on bridging the digital divide?

15. Are there any initiatives from headquarters to address the digital divide?

16. Are there any public libraries in your province that are involved with projects on bridging the digital divide? If so, will you please elaborate, with specific reference to the following (for Gauteng, Limpopo and KwaZulu-Natal provinces this will only be considered as a control question)?

a) Nature of the projects

b) Funding of the projects

c) Partnerships formed for these projects (e.g. organisations, societies).

17. Are any future initiatives planned on bridging the digital divide that you are aware of?

a) Headquarters

b) Libraries falling under your jurisdiction

c) Community.

18. What do you think are the challenges affecting provincial library services and public libraries in their effort to bridge the digital divide?

## D. Suggestions

19. What strategies do you think are required for public libraries to contribute effectively to address the digital divide?
20. Are there any other aspects you would like to bring to our attention?

# APPENDIX B: QUESTIONNAIRE FOR HEADS OR REPRESENTATIVES OF PUBLIC LIBRARIES

**Questionnaire for heads or representatives of public libraries in three provinces: Gauteng, Limpopo and KwaZulu-Natal**

The purpose of the questionnaire is to collect data as part of a study conducted by Mr Hamilton Mphidi towards his D Phil degree in Information Science in the Department of Information Science, University of Pretoria. My personal details are: mphidimh@tut.ac.za, Tel: 012 382 4910, Cell: 083 282 1332. My supervisor for this study is Prof Ina Fourie: ina.fourie@up.ac.za, Tel: 012 420 5216, Cell: 082 707 8062. We will greatly appreciate your participation and look forward to sharing the results of the study with you.

**A. Please mark the provincial structure to which your library reports:**

| Gauteng | Limpopo | KwaZulu-Natal |
|---------|---------|---------------|
|         |         |               |

**B. Library statistics**

1. Does your library have statistical information available?

| Yes | No |
|-----|----|
|     |    |

If yes, can you please provide statistics for the issues listed below?

| Issues | Numbers | Not available |
|--------|---------|---------------|
| Number of library staff (including librarians and library assistants) | | |
| Number of registered library members | | |
| Approximate number of visitors per day | | |
| Approximate number of visitors per week | | |
| Are there any other statistics that you think might be of interest for this study? If yes, please add these by using the space provided below or write on a separate sheet. | | |

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## C. Public library and internet access/provision

2. Does your library have a website/page?

| Yes | No |
|-----|----|

(If yes, please provide the universal resource locator)

_____

3. How many computers does your library have for use by the following?

a) Staff _____

b) Public _____

4.  How many of the computers have internet access?

_____

5. How long has the library been providing internet access to the following?

Please note, the public is divided into members and non-members of the library.

| Period of providing internet access | Staff | Members | Non-members |
|--------------------------------------|-------|---------|-------------|
| Not provided | | | |
| Less than a year | | | |
| 1 - 2 years | | | |
| 3 - 4 years | | | |
| More than 4 years (please specify) | | | |

6. Does the library charge for internet access?

| Yes | No |
|-----|----|

If Yes, how much are the users charged?

_____

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### D. Public library and addressing the digital divide

7. What is your personal opinion on the digital divide?

_____

_____

_____

8. Does your library have a policy on bridging the digital divide?

| Yes | No |
|-----|-----|

If Yes, can you please elaborate?

_____

_____

_____

9. Is your library taking any initiatives to bridge the digital divide?

| Yes | No |
|-----|-----|

If Yes, can you please
elaborate?_____

_____

_____

10. What role do you think your own library should play in bridging the digital divide?

_____

_____

_____

_____

11. What initiatives do you think your library could take to bridge the digital divide?_____

_____

_____

_____

12. Please indicate which factors, in your opinion, are affecting your library's ability to play a role in addressing the digital divide. (You may mark more than one option with an X.)

| | |
|---|---|
| Inadequate physical space | |
| Lack of funds | |
| Staff shortage | |
| Lack of staff training | |
| Lack of ICT resources | |
| Lack of government support | |
| Lack of strategies on addressing the digital divide | |
| Lack of ICT strategies | |
| Others (please specify) | |

### E. Education and training

13. Does your library provide training? (The content of training is covered in the next question, and the type of training in question 15.)

| Training for | Yes | No | Comments (if applicable) |
|---|---|---|---|
| Staff | | | |
| Members | | | |
| Non-members | | | |

Please elaborate briefly if necessary:

_____

_____

_____

_____

14. If applicable, please identify the content of the training that your library offers. (You may mark more than one option with an X.)

| Training content | For staff | Members | Non-members |
|---|---|---|---|
| General computer skills (e.g. how to use a mouse or keyboard) | | | |
| General computer software use (e.g. Microsoft Office) | | | |
| General internet use (e.g. setting up email, web browsing, web searching) | | | |
| Information literacy training (which includes many of the other issues mentioned here) | | | |
| Using the library's Online Public Access Catalogue (OPAC) | | | |
| Using online databases | | | |
| Social networking (blogging, social bookmarking, Facebook, etc.) | | | |
| Other (please specify) | | | |

15. Please identify the type of training that your library offers, which is relevant to addressing the digital divide. (You may mark more than one option with an X.)

| Type of training | For staff | Members | Non-members |
|---|---|---|---|
| Formal training classes | | | |
| Informal assistance | | | |
| One-on-one training sessions by appointment with library staff | | | |
| Online training material (e.g. web-based tutorials, web-based presentations, etc.) | | | |
| Other (please specify) | | | |

## F. Public library involvement with community services and plans for future

16. Is your library working with partners in the community in an effort to address the digital divide?

| Yes | No |
|---|---|

If yes, please explain briefly and mention partners if possible.

_____

_____

_____

17. Is your library planning any initiatives for the near future (e.g. next year or two) to address the digital divide?

| Yes | No |
|---|---|

If Yes, please explain briefly.

_____

_____

_____

18. Who, in your opinion, should take responsibility for addressing the digital divide?

_____

_____

_____

19. It will be appreciated if you will bring to our attention any other issues of importance that could shed light on how public libraries could help to bridge the digital divide

_____

_____

_____

_____

**Thank you for taking time to complete this questionnaire.**

# APPENDIX C: INTERVIEW SCHEDULE FOR HEADS OR REPRESENTATIVES OF PUBLIC LIBRARIES

**Questions for semi-structured interviews with the heads or representatives of public libraries**

The purpose of the interview is to collect data as part of a study conducted by Mr Hamilton Mphidi for his D Phil degree in Information Science in the Department of Information Science, University of Pretoria. My personal details are: mphidimh@tut.ac.za, Tel: 012 382 4910, Cell: 083 282 1332. My supervisor for this study is Prof Ina Fourie: ina.fourie@up.ac.za, Tel: 012 420 5216, Cell: 082 707 8062. We would greatly appreciate your participation and look forward to sharing the results of the study with you.

*The researcher and possibly an assistant will take brief notes during interviews.*

**Name of the province**

| Gauteng | Limpopo | KwaZulu-Natal |
|---------|---------|---------------|

### A. ICT infrastructure and services

1. Can you comment on the suitability of your ICT infrastructure (e.g. computers, internet access, budget, etc.) and the impact it has on bridging the digital divide (e.g. the availability of ICT to staff and the public)?

### B. Public library and the digital divide

2. What is your opinion on the digital divide?

3. Can you please explain what role you think public libraries can and should play in bridging the digital divide, as well as the reasons for your point of view? Please refer specifically to the following:

a) Public libraries in general

b) Your public library.

4. Is your library involved in any initiatives in an attempt to address the digital divide? If so, will you please elaborate?

5. Who should take responsibility for bridging the digital divide?

6. Do you think that the public library staff is sufficiently prepared and supported in addressing the digital divide? Will you please elaborate?

7. What do you think about partnerships with community members in bridging the digital divide?

8. What challenges are you encountering in efforts to address the digital divide?

9. What are your views on addressing such challenges?

## C. Training of staff and users

10. What training do you think is necessary to bridge the digital divide? (Please comment on the focus and type of training, e.g. computer literacy training, information literacy training, internet searching.)
a) Staff
b) Public: library members
c) Public: non-library members

11. Is your library involved in any training initiatives? Is yes, will you please explain?

12. Is ICT training explicitly linked to bridging the digital divide? If so, will you please elaborate?

**D. Future plans or opportunities**

13. Do you have any plans in the near future to address the digital divide (e.g. within the next year or two)?

14. What strategies do you think are required for public libraries to contribute effectively to addressing the digital divide?

15. Are there any other issues you think we should note?

**Thank you for your participation.**

**APPENDIX D: Questions for follow-up interviews with directors of the provincial library services that participated in the 2011/2012 data collection:**

1) Gauteng Provincial Library Service
2) KwaZulu-Natal Provincial Library Service
3) Limpopo Provincial Library Service

The purpose of the follow-up interviews is to gather more data on the progress made and new developments from the time of data collection in 2011/2012 and to obtain more data as suggested by one of the international examiners. The interviews will be conducted with directors of provincial library services or their representatives. The interviews will be conducted either face-to-face or through Skype. Issues that will feature in the questions to be asked include availability of policy to bridge the digital divide, new initiatives to address the digital divide, statistics on how computers are used and what they are used for, perceptions of the reliability of internet connections, surveys to determine user needs, perceptions on support to users, marketing of services and impact of mobile phones on information provision or other services. (These questions all build on the original questions as well as suggestions by one of the international examiners.)

1. Did the Provincial Library Service adopt a policy on bridging the digital divide since 2011, and if so what does it addresses?

2. Are there any initiatives from the Provincial Library Service to bridge the digital divide since data collection in 2011 e.g. installing more computers, more internet access, training of staff, training of users, specific projects, partnerships, and fundraising/obtaining grants?

3. Do you have or expect the public libraries to keep statistics on how the existing computers are used in libraries and what they are being used for?

4. What are your perceptions on the reliability of internet connections in the public libraries – who are your service provider(s)?

5. Have you used any surveys or other means of data collection to determine the (1) needs of the users; (2) the staff; (3) the wider community?

6. What is your perception on how well you support users in terms of access to information, ICT and gaining the skills to use these?

7. How do you market your services to the users, public library staff, and wider community and how do you encourage them to use ICT?

8. What impact do you think mobile phones (i.e. smart phones) have on your services?

9. Opportunity for them to make further comments.

## APPENDIX E: INFORMED CONSENT FORM (Form for research subject's permission)

(Must be signed by each research subject, and must be kept on record by the researcher)

1       Title of research project: **Strategy for South African public libraries to bridge the digital divide**

2       I ………………………………………… hereby voluntarily grant my permission for participation in the project as explained to me by …………………………………………………………………………………..

3       The nature, objective, possible safety and health implications have been explained to me and I understand them.

4       I understand my right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for the purposes of publication.

6       I understand that upon signature of this form, I will be provided with a copy.


Signed:        _____       Date: _____

Witness:       _____       Date: _____

Researcher: _____       Date: _____