

**THE ACCESS, INTERACTION, USE AND IMPACT OF INFORMATION
AND COMMUNICATION TECHNOLOGIES AMONG CIVIL SERVANTS
IN THE UMHLATUZE AREA: A SOCIAL INFORMATICS STUDY**

BY

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Master of Library and Information Science (MLIS) in the
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DECLARATION

I, Mduduzi Aubrey Ntetha declare that this thesis is my original work except where proper referencing is made in the text. The thesis has not been submitted for the award of any degree to any other University.

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DEDICATION

This work is dedicated to the following people:

My Mother Florence, for her love and financial support over the years since I started my first degree at Zululand University. My sisters Zama and Nothando for believing in me and encouraging me all the time. My two daughters, Sibahle and Luyanda for their trust in me. My loving Nephews (Nduduzo and Nhlanhla) and Nieces (Nonhle and Andiswa) for their love.

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ABSTRACT

Social Informatics is the field of study concentrating on the social aspects of Information and Communication Technologies (ICT) utilisation with researchers in the field concentrating on aspects such as human interaction with ICTs, the effect of certain hardware and software on utilisation and the impact that the use of ICTs have on the daily lives of people in society. One of the areas where the use of ICTs can have a huge influence is on governmental service delivery, where these tools can be used to speed up processes, beef up security, provide access to, and disseminate information, and be used in virtually all government departments to provide a more effective and efficient service to all its people.

The aim of the study was to examine the use, impact and interaction of ICTs for service delivery among Civil Servants in the uMhlatuze area. The study was carried out using both qualitative and quantitative methods through survey research. The objectives of the study were: to determine the nature of the services rendered in the three targeted Departments (Education, Health and Social Development), to establish the types of ICTs currently in use by Civil Servants in uMhlatuze area, to explore how the Civil Servants interact with ICTs in the municipality, to explore the impact of the Civil Servants' interaction with ICTs, to determine the training needs of the Civil Servants, in so far as effective ICT utilisation is concerned, to determine users level of satisfaction with the standard of service delivery, to outline the challenges faced in the service provision.

Data was collected via questionnaires that were submitted to the three departments by the researcher. Interviews were also conducted with both civil servants and their clients. The aim of the interviews was to get their personal opinions on problems facing service provision. The number of responses from the distributed questionnaires varied: Education (21), Health (9) and Social Development (5). Managers from the three departments were interviewed with an aim of understanding types of services they offer to clients, clients satisfaction with service offered to them, the use of computers in providing services, the level of computer literacy among staff (Civil Servants),

difficulties experienced when providing services to clients, and the effect of the availability of computers in providing service delivery.

The study revealed that not all ICT tools are generally available and/or used by civil servants in the uMhlatuze Municipality. It was also found that most new technologies were neither used, nor available, or could not be accessed by civil servants in the departments, e.g. the Internet, laptop computers, databases, video cameras, video recorders, sound/tape recorders, overhead projectors, and information systems. The government also does not appear to make much use of radio and television, which are mediums that are often used in this country for communication. The researcher recommended that the government should ensure that each civil servant has a computer linked to the Internet on his or her table. All available ICT tools should also be provided to the different departments because they deal with different social needs everyday that may require different solutions. A lack of skills to operate a number of ICTs, especially the computers was identified as a serious impediment to effective service delivery. Therefore it was recommended that the Departments of Education, Health and Social Development send their staff for training on the efficient utilization of ICT tools, specifically computer related training. It was further recommended that computer literacy courses and refresher courses be offered on a continual basis in order to elevate the level of computer literacy among the civil servants, especially for programmes such as Word processing, Excel and PowerPoint which are used almost daily in the public service.

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GLOSSARY OF TERMS

Civil servant - A person employed by the government.

Civil service - It is a government department in a country (Hornby, 2000).

Demarcation – the location in a facility where the network service provider supplies the point of connectivity for internal wiring and end user equipment

Department – a section of a large organisation such as a government, business, or university (Hornby, 2005).

Government – the organisation that is the governing authority of a political unit.

ICTs – An acronym that stands for Information and Communication Technologies. It is an electronic means of capturing, processing, storing, and communicating information.

IT - Information Technology

Social informatics – the systematic, interdisciplinary study of the design, uses, impact and consequences of information technologies (IT) that takes into account their interaction with institutional and cultural contexts (Kling, 1999).

Welfare – practical or financial help that is provided, often by the government, for people or animals (Hornby, 2005).

LIST OF ABBREVIATIONS

ADSL	-	Asymmetric Digital Subscriber Lines
AIDS	-	Acquired Immunodeficiency Syndrome
AMR	-	Automated Meter Reading
BCM	-	Business Continuity Management
BNS	-	Backbone Network Services
CEO	-	Chief Executive Officer
CSCW	-	Computer Supported Co-operative Work
EIU	-	Economist Intelligence Unit
FET	-	Further Education and Training
G2G	-	Government to Government
GCIS	-	Government Communication and Information Systems
GPRS	-	General Packet Radio Services
HANIS	-	Home Affairs National Information System
HDTV	-	High Definition Television
HIV	-	Human Immunodeficiency Syndrome
HOD	-	Head of the Department
HSDPA	-	High-speed Downlink Packet Access
HSGIC	-	Heads of State and Government Implementing Committee
ICDL	-	International Computer Drivers Licence
ICT	-	Information and Communication Technologies
IDABC	-	Interoperable Delivery of European e-government Services to the Public Administrations, Businesses and Citizens
IPv4	-	Internet Protocol Version 4
Ipv6	-	Internet Protocol Version 6
IT	-	Information Technology
KZN	-	Kwa-Zulu Natal
LAN	-	Local Area Network
MACIS	-	Mamelodi Community Information Services
MCA	-	MultiChoice Africa

MEC	-	Member of the Executive Committee
MNP	-	Mobile Number Portability
NEPAD	-	New Partnership for Africa's Development
NGO	-	Non-governmental organisation
NRI	-	Networked Readiness Index
OS	-	Open Source
PC	-	Personal Computer
PORTAL	-	Portsmouth Online Real Time Traveller
POTS	-	Plan Old Telephone Service
RAM	-	Random Access Memory
RSA	-	Republic of South Africa
SABC	-	South African Broadcasting Corporation
SAGS	-	South African Government Services
SAQA	-	South African Qualifications Authority
SASSA	-	South African Social Security Agency
SDTV	-	Standard Definition Television
SI	-	Social Informatics
SITA	-	State Information Technology Agency
SMB	-	Small and Medium Businesses
SMS	-	Short Message Services
SPSS	-	Statistical Package for Social Sciences
TCC	-	Traffic Control Centre
TCP	-	Transport Control Protocol
UK	-	United Kingdom
USA	-	Universal Service Agency
USAASA	-	Universal Services and Access Agency of South Africa
VPN	-	Virtual Private Network
VSAT	-	Very Small Aperture Terminal
VTC	-	Video-Teleconferencing

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CHAPTER 1

BACKGROUND OF THE STUDY

1.1 Introduction

The term “Social Informatics” or “sosioinformatikk” originated in the early 1980s from Stein Braten a Norwegian Sociologist in Oslo (Rosenbaum, 2000:6). In 1996 Rob Kling together with a group of researchers who had an interest in advancing critical scholarship about the social aspects of computerisation, met to discuss this relatively new field of study (Agre, 1996; Kling, 1999). During the discussions, it was agreed that the dispersion of related research in a wide range of journals and the use of different terminologies was hindering both research on the topic and the abilities of “research consumers” to find important work on this topic (Kling, 2000). From debates in published [sources](#) as to what this “new” research field should be called, general consensus was eventually reached that a common name for the field would be helpful, and after significant deliberation, the term “social informatics” was adopted.

Over the ensuing years, a number of definitions and descriptions as to what exactly is meant by “social informatics” have been offered. Rosenbaum and Sawyer (n.d.) found that researchers from fields as varied as Computer Science, Information Science, Communications, Sociology, Anthropology, Information Systems, Management Science, Education and Library Science have all been investigating the ways in which Information and Communication Technologies (ICTs) and the people who design, manage and use them shape and influence each other in different social contexts. A solid working definition was offered at a workshop held at the Indiana University in 1997 by Kling (1999:n.p.): “Social informatics refers to the interdisciplinary study of the design, uses and consequences of ICTs that takes into account their interaction with institutional and cultural contexts”. According to Kling, SI can, therefore, be seen as the study of the social aspects of computers, telecommunications, and all related technologies.

Pigg in Kling (1999: n.p.) describes SI as the study of the role of information technology in social and organisational changes and vice versa. This concerns the ways in which the social organization of IT is influenced by social forces and practices.

At a seminar focusing on the field in Indiana, SI was defined as the study of the relationship between social systems and ICTs (Kling, 1999: n.p.)

Kling (2000: n.p) suggests that the cultural and institutional contexts in which ICTs are embedded influence the ways in which they are developed, the kinds of workable configurations that are proposed, how they are implemented and used, and the range of consequences that they have for organisations and other social groupings. In this sense, ICTs can most usefully be conceptualised as “socio-technical systems”, meaning that they are composed of an interrelated and interdependent mix of people, their social and work practices, the norms of use, hardware and software, the support systems that aid users, and the maintenance systems that keep the ICTs operating.

According to Kling (2000:n.p.) ICTs are sometimes referred to as “technologies of freedom” because of how they extend the capabilities of people and organisations. It is common for many technology-centered accounts of new ICTs to emphasise the ways in which they enable new kinds of actions that were previously more costly, difficult or impossible, e.g. access to more data, instant communication, etc. Organisational informatics researchers have found that ICTs can restructure workplaces through the ways in which they are incorporated into the everyday lives of those who use them. ICTs enable people and organisations to reduce some of the communicational restrictions of space and time in ways that were incomprehensible in the not too distant past.

Almost all the above definitions see Social Informatics as the study of the use of ICT/IT technologies to support ways in which the society and businesses do their daily tasks. The inclusion of ICT in the way people do their business is to make sure that the product at the end is of good quality and that work can be done in an easy way, yet at a cheaper rate, for example, the Internet has changed the way communication is done in businesses and within the society at large where a person in Europe can communicate via email to someone in South Africa in seconds. All definitions above are in agreement that Social Informatics is ICT/IT versus Society and organisations.

From the descriptions above and based on the perspectives on offer from different disciplines, the study of social informatics may include the following:

a) Infrastructure.

This includes telecommunications, telecentres, hardware (computers, telephones, fax machines, etc.) and software (e.g. Windows XP and Microsoft Office). The term “telecommunications” refers to the exchange of information over significant distances via electronic means (Telecommunications, 2008:1). Telecenters are public places where people can access computers, the Internet, and other digital technologies that enable people to gather information and create, learn and communicate with others while they develop essential 21st-century digital skills (Fillip and Foote, 2007: v). The primary goal of a telecenter is to provide the public with tools that enhance communication and the sharing of information. A number of administrative and operational arrangements are possible; hence it should be pointed out that community telecentres differ from organisational franchises or private cybercafés. Whatever the management model, there is general consensus that the telecenter concept is a valid development tool (Etta, 2003).

b) Human factors such as acceptance, attitudes, skills, training, awareness and the use and adoption of ICTs.

While IT has made all sorts of new activities possible and either completely transformed or added new features to old activities, people do not easily shed their old habits and practices with the every newly introduced technology (Borgman, 2000). Many factors influence the process of adoption, such as household-specific characteristics, community-level factors, and institutional arrangements and policies. These factors must be taken into account when attempting to persuade people to adopt any product. Further complications arise when different cultures are involved, since each set of factors for each culture will probably differ as well. For example, Europe and North America are the strongest countries in the field of technology. They are at a high level in terms of the general public’s rate of adoption and acceptance; people have had many years to get used to new technologies, which comfortably fit into their lives. Most people in developing countries are still struggling to adopt and accept IT (computers and Internet) because of traditional ways of living.

The new breach in the storage capacity and speed of communications capability of digital information devices have had far reaching and sometimes unnoticed effects on families, communities, institutions and democratic processes. It is, therefore, not surprising that, with the speed of their development, cultures in developing countries have problems adapting to these technologies (Cultural Background and Technology Acceptance: Evaluation of ICT projects that bridge the digital divide, n.d). Generally speaking, people in developing countries are using ICTs, and many ICT projects are in place, but despite all the new initiatives, there is still a lack of skills when it comes to use and poor awareness of such initiatives. Other common problems experienced include insufficient telecommunications infrastructure and Internet connectivity, expensive Internet access, absence of adequate legal and regulatory frameworks, and a shortage of requisite human capacity (Cultural Background and Technology Acceptance: Evaluation of ICT projects that bridge the digital divide, 2005).

Benton (2007:2) believes that the managers and director-generals in the governments' various departments should not and cannot be ignorant of the IT systems that are available to run their departments effectively. Mlambo-Nguka, the previous Deputy President of South Africa, warned that senior managers across a range of levels in government cannot be expected to widen or transfer knowledge of ICTs if they themselves are not aware or trained to use such tools and services (Benton, 2007:2).

c) Policy and legal framework, which constitutes the implementation of an ICT policy, e-governance and universal access.

The main function of e-government is to allow government to provide the public in general and business in particular with electronic access to its services and policies. Universal access in South Africa is promoted by the Universal Service and Access Agency of South Africa (USSASA), which function in terms of the regulatory policy framework. USAASA is mandated to promote and create an environment wherein people are aware of the uses of ICT tools and how to use such services/tools, and to intervene where necessary so that marginalised people are able to gain access to ICTs (SA Yearbook, 2008:114). Telecenters, for example, help meet the goal of 'universal access' by providing community-based access to technology (Cisler, 1998:1). An ICT framework within South Africa is intended to help the country achieve its economic,

social upliftment, and empowerment goals. The aim of this and other initiatives is for South Africa to become a key player on the global ICT arena (Herselman, 2003).

d) Support – maintenance, sustainability and management.

To maintain and sustain ICTs in organisations (to foresee that the tools function for a long time), someone has to take responsibility for their proper functioning by screening them for any errors that may occur or disturb their intended purpose. The management of ICTs includes measures for their repairs in case they are rendered inoperable, how they are maintained in terms of day-to-day functioning, and their maintenance in supporting employees in executing their tasks at work (Herselman 2003.)

e) Impact.

This refers to the speed with which the computers can do their work the quality of the work produced by the ICTs, the sharing of resources (data, printers, fax machines, etc.), and accountability (Herselman: 2003.).

1.1.1 Purpose and application of social informatics

A major aim of the field is identifying the role of ICTs in the social context in the society at large, or in more specific and intimate settings (Cole, 2006:1). According to Fillip and Foote (2007:v), social informatics is concerned with the use of digital technologies to support community, economic, educational, and social development by reducing isolation, bridging the digital divide, promoting health issues, creating economic opportunities, and reaching out to youth. Social informatics aims to ensure that technical research agendas and system designs are relevant to people's lives (Kling, 2008:n.p.).

Additionally for a government, Chadwick and May (n.d., n.p.) suggest that IT can have the following uses:

IT makes it easier for businesses and individuals to deal with the government,

- Enables the government to offer services and information through new media like the Internet or interactive TV;

- Improves communications between different parts of government so that people do not have to be asked repeatedly for the same information by different service providers;
- Gives staff at call centers and other offices better access to information so that they can deal with members of the public more efficiently and more helpfully;
- Makes it much easier for different levels of government to work together, e.g. central government with local authorities or the voluntary sector, or government with third party delivery channels such as post offices or private sector companies and
- Helps government to function like a learning organisation by improving access to and the organization of information (Chadwick and May. n.d.:n.p).

1.1.2 The establishment and development of South African ICT application initiatives

Several initiatives have been introduced in the country to provide/develop the necessary infrastructure through which the government can supply services or e-government to the public. These include:

- **SITA (State Information Technology Agency).**

This was established in 1999 to consolidate and co-ordinate South Africa's' IT resources to achieve savings through scale, increase delivery capabilities, and enhance interoperability. SITA focuses on providing effective and efficient ICT products and services across the three spheres of government, i.e. National, Provincial and Local government (SITA, 2008:1).

- **Govtech.**

Following its motto. "collaborate, innovate and deliver", Govtech aims to promote knowledge sharing and foster dialogue among various ICT role players who share a common interest in transforming government (Govtech, 2008:1),

- **Arivia.kom.**

Arivia.kom is a leading South African IT solutions company and service provider. It focuses on high-end business-technology solutions that support the public sector and

large private sector corporate that are primarily situated within Africa. IT infrastructure solutions implemented include for example:

- Spoornet (IT infrastructure Outsource)
 - Eskom (Full IT outsource)
 - Natref (Local Area Network LAN upgrade)
 - Capital Alliance (Business Continuity Management – BCM – implementation with Comparex Africa)
 - Department of Water Affairs and Forestry (Applications and IT infrastructure support outsource agreement)
 - The State Information Technology Agency (Virtual Private Network –VPN – enabled government core network, with technology supplied by Nortel Networks)
 - Botswana Ministry of Agriculture (IT infrastructure implementation), (Arivia.kom, 2008:n.p.)
- Universal Service Agency

The Universal Service Agency (USA) in South Africa is an official body set up by the Telecommunications Act of 1996 to promote the attainment of universal service by encouraging, facilitating and offering guidance with respect to any scheme that provides universal access or universal service (Benjamin, 2000).

- **Acacia.**

The Acacia initiative is an international program designed to empower sub-Saharan communities by giving them the opportunity to use/apply ICTs for their own social and economic development. This initiative is an integrated programme of research, development and demonstration projects that address issues of applications, technology, infrastructure, policy and governance (Etta, 2003).

- **Savant.**

The South African Technology Vanguard (Savant) is a public-private partnership between the government and several key players in the South African technology industry. Savant promises to accelerate the development of the country's growing

information, communications and electronics sectors and promote the country's innovations abroad (Savant to promote SA technology, 2003).

- **Infraco.**

Infraco's objective is to act as a provider of broadband capacity through fibre-optic cables to other operators like Neotel (Benton, 2007:1).

1.1.3 Information and Communication Infrastructure in South Africa

According to Kling (1999:n.d.), South Africa has the most developed IT infrastructure in Africa. ICT infrastructure is the backbone of ICT applications, and encompasses all equipment, carrier technology, functionality, accessibility, and operating systems or software (Kling 1999: n.p.).

ICT infrastructure in South Africa can be categorised under the following:

- **Cellular or Mobile industry.**

Over the years, South Africa has witnessed tremendous growth in the country's cellular phone industry. South Africa has four operators, namely Vodacom, MTN, Cell C and Virgin Mobile. In July 2007, Telkom estimated that the Sim card penetration of the cellular industry in South Africa stood at an estimated 89% of the population. In February 2007, Vodacom deployed more than 90 000 community-service telephones to South Africa's under-serviced areas. Vodacom's community phone services have become invaluable sources of entrepreneurial activity for hundreds of community phone-shop operators. Since its launch in 1994, the Community Phone Shop concept has expanded into communication centres where budding entrepreneurs, job seekers and school children access essential business communication services, such as faxes, e-mails and the Internet, daily (SA yearbook, 2008:116).

- **Community radio and TV.**

Today, the South African Broadcasting Corporation's (SABC) national television network consists of three full-spectrum free-to-air channels and one satellite pay-TV channel aimed at audiences in Africa. Combined, the free-to-air sound broadcasting stations reach a daily adult audience of almost 20 million people via the terrestrial signal distribution network and a satellite signal. South Africa has more than four million licensed television households. Between 50% and 60% of all programmes transmitted are produced in South Africa. Locally produced television programmes are augmented by programmes purchased abroad, and by co-productions undertaken with other television programming organizations. In 2007, the SABC's national radio network consisted of 15 public broadcast-service radio stations and three commercial radio stations, both broadcasting in 11 languages, as well as an external radio service in four languages that reached an average daily adult audience of 19 million South Africans (SA yearbook, 2008:120).

- **Internet.**

South Africa's online audience has grown by over 12.1% over the past two years, particularly as high broadband prices have slowly started to decrease (SA yearbook, 2008:115)

- **GCIS (Government Communication and Information System).**

GCIS was established under the terms of Section 7 (Subsection 2 and 3) of the [Public Service Act \(1994\)](#) and officially launched on the 18th of May, 1998. GCIS's vision is to help meet the communication and information needs of the government and the public in order to ensure a better life for all. GCIS's mission is to provide leadership in government communication and to ensure that the public is informed of the government's implementation of its mandate. The system is located in The Presidency and is behind the launch of the new Government Communication System. The CEO of GCIS is the official spokesperson for the government, and attends and services the Cabinet. A high premium is placed on development communication that emphasises direct dialogue, especially with people in disadvantaged areas. GCIS is involved in drafting communication strategies and programmes for the whole of government at

national level, and integrating the communication operations of all government departments (SA yearbook, 2008:1).

1.1.4 Governmental service delivery

The Republic of South Africa (RSA) is a constitutional democracy that is overseen by three structures of government, namely the National, Provincial and Local governments. It is divided into nine provinces, each with its own provincial legislature. All these governmental structures derive their powers and functions from the Constitution of the RSA (Cape Gateway, 2009: n.p.).

According to Kate (2003:n.d.), e-governance is a set of technology-mediated processes that are changing both the delivery of public services and the broader interactions between citizens and government.

According to Environmental Service Delivery in South Africa (n.d.), service is defined as an activity or action that satisfies the needs of a person. In other words, it is the manner in which a customer's needs are met. The government of South Africa is responsible for rendering the following services to the South African public:

- **Birth** – services relating to pregnancy, child care, modification of birth details, and counseling
- **Parenting** – child benefits, child documents, child abuse, adopting a child and maintenance
- **Education and training** – schools, tertiary institutions, education, SETA, and further education and training
- **Youth services** – sex and relationships, drug and alcohol abuse, and voting
- **Relationships** – marriage and domestic violence
- **Living with a disability** – providing benefits and health services for disabled persons
- **The world of work** – setting up and running your own business, government employment, employer and employee rights, safety at the work place, accident compensation, taxation, unemployment insurance fund, and SETA
- **Social benefits** – social services and banking

- **A place to live** – housing subsidies, deeds registry, land invasion, postal services and shelter homes
- **Transport** – driving and learning to drive, motor vehicle registration, and testing of a motor vehicle
- **Travel outside South Africa** – passports, foreign services and foreign citizenship
- **Sports and recreation** – leisure, sports and recreation
- **Citizenship** – personal identification and voting
- **Dealing with the law** – reporting crime, suing, being arrested, obtaining legal representation, maintenance, estate of the deceased, police administration, firearms, complaints, prison administration
- **Retirement and old age** – financial needs and grants
- **Death** – registration of death and estate of the deceased (South African Government Services, 2008)

Other than e-governance, the South African government has also initiated two other service delivery initiatives, namely Vision 2014 and Batho Pele.

Vision 2014 was introduced to attempt to achieve the following:

- to reduce unemployment by half
- to reduce poverty by half
- to provide the skills required by the economy
- to ensure that all South Africans are able to fully exercise their constitutional rights and enjoy the full dignity of freedom and
- to provide a compassionate government service to the people (Health Summit, 2000)

Not all the Vision 2014 principles are directly ICT related but the principles: “*To provide a compassionate government service to the people*” and “*To ensure that all South Africans are able to fully exercise their constitutional rights and enjoy the full dignity of freedom*” requires a civil service geared to disseminate information to the people and provide fast,

efficient and effective service delivery programmes, thus implying the use of ICT as far as practically possible.

Batho Pele (a Sotho translation for “People First”) is an initiative that aims to:

- encourage service orientation among public servants;
- fight for outstanding service delivery; and
- Commit to the constant improvement of service delivery.

Batho Pele is a mechanism that encourages citizens to hold public servants accountable for the level of service delivery that they receive. Using the 8 principles of Batho Pele, i.e. consultation, setting service standards, increasing access, ensuring courtesy, providing information, openness and transparency, redress, value for money the government aims to introduce a improved service delivery agenda (Batho Pele, 2003). Undoubtedly, ICT need to play a major role especially in terms of access to information, providing information and openness and transparency.

1.2 Contextual Setting

The City of uMhlatuze is situated on the north-east coast of KwaZulu-Natal, South Africa. It is a progressive city striving to achieve a successful balance and synergy between industry, the region’s rich environmental assets progressive heavy industries (Mondi paper, Richards Bay Minerals, Transnet, BHPBilliton, and Foskor) and the community (uMhlatuze News, 2005).

UMhlatuze municipality was established on the 5th of December, 2000, following the demarcation process and the local government elections. It encompasses the towns of Empangeni, Richards Bay, Esikhawini, Ngwelezane, Nseleni, Vulindlela and Felixton, as well as the rural areas under Amakhosi Dube, Mkhwanazi, Khoza, Mbuyazi and Zungu [these areas are rural areas surrounding the uMhlatuze Municipality which are ruled by traditional leaders called Amakhosi. (uMhlatuze News, 2005).

Richards Bay is considered to be the region’s industrial and tourism hub, Empangeni the commercial hub, and Esikhawini the largest suburb. A variety of government departments are scattered throughout the various towns comprising uMhlatuze City, such as the

Departments of Education, Health, Social Welfare and Population Development, Home Affairs, and Arts and Culture.

The Department of Education has a regional office in Empangeni. The department caters for teachers'/educators' problems, employment opportunities, salary/fees problems, and all other issues concerning the daily running of schools in the area. To assist with their daily activities, the department uses variety of ICT tools. The researcher observed ICT tools such as computers, telephones, fax machines, the Internet, e-mail, a television and video machine. Records containing their client's profiles are stored on computer databases, thus necessitating access to computers. The local Department of Education offers the following services:

- education and training – services involving schools, tertiary institutions, education, SETA, and further education and training;
- schools – admission to a public school, the re-issuance of matric certificates, home schooling, registration as a teacher and
- tertiary institutions – national student financial aid scheme (NSFAS), registration with a higher education institution, evaluation of foreign qualifications, verification of qualification achievements, national automated archival information retrieval, registration as a forensic scientist, special registration as a professional scientist, registration as an environmental scientist, registration as a professional natural scientist, appealing against the refusal of registration, and private higher education.

The Department of Health is concerned with serving the needs of clinics and hospitals in the region, as well as the staff servicing these institutions. The department is also responsible for supplying the general public with information on health issues. The ICT tools observed in their offices include computers, fax machines, Internet services, and a television and video machine. The Department of Health offers the following services:

- health services to the local municipalities (i.e. clinics and hospitals), non-governmental organizations and traditional healers;
- health services to the local municipalities (i.e. clinics and hospitals), non-governmental organizations and traditional healers;
- health care services to all the above areas;
- the formulation of policies and legislations, norms and standards for health care;
- ensures the appropriate use of health care resources;

- coordinates information systems and monitors national health goals;
- regulates the public and private health care sectors;
- ensures access to cost-effective and appropriate health commodities and
- liaises with health departments in other international agencies and countries (South African Yearbook, 2008:2).

The Department of Social Welfare and Population Development has regional offices in all the townships within the uMhlatuze city's boundaries, as well as in Richards Bay itself. Observations by the researcher showed that the ICT tools in the department include computers (for access to their client database), telephones, televisions, fax machines, and e-mailing facilities. The Department of Social Development offers the following services:

- child adoption. Adoption is the final resort when all attempts at reuniting a child with its biological family have failed. The Registrar of Adoptions has to keep an accurate register of all the adoptions that take place in the country;
- early childhood development. Permission to establish and register an early childhood development centre or when applying for changes to an existing registration certificate, by a person, organisation or community must be obtained from the Department of Social Development nearest to the proposed centre. Registration of the proposed centre is liaised by the Department with the local authority and the Minister concerned. The Department is also responsible for monitoring the required standards of service delivery by the centres;
- care dependency grant. A care dependency grant (grant for caring for a disabled child) is a monthly payment from the government to people who care for children with severe disabilities and/or who are in need of full-time and special care. These people could be parents, foster parents, or those who have been appointed as caregivers by the court Care dependency grant (as of April 2009) is R960;
- child support grant. A child support grant is money paid to the primary care giver of a child to cater for the child's basic needs. The child support grant (as of April 2009) is R240;
- disability grant. A disability grant is an income given to people who are physically or mentally disabled, unfit to work or unable to support themselves. A person can get a permanent disability grant if disability will continue for more than a year and a

temporary disability grant if his/her disability will continue for a period of not less than six months or for a period of not more than twelve months. The maximum grant (as of April 2009) is R1010 per month;

- foster care grant. Foster care is an essential family and child welfare service for children and families who have to live apart for a certain period of time. Placement of affected children and the eventual re-uniting with their families is the responsibility of the Department. The grant (as of April 2009) is R680;
- grant in aid. A grant in aid is an additional grant awarded to persons who are in receipt of an old age grant, disability grant or war veteran's grant, and who need fulltime care from another party. A grant in aid cannot stand alone. The grant amount (from April 2009) is R240;
- pensions or old age grant. An old age grant is a monthly income provided by the South African Social Security Agency to older people. The grant is only paid out to people whose financial income is below a certain level. The income and assets of the applicant and their spouse are also assessed by the Department to find out if they qualify and what their entitlement is. The old age grant (from April 2009) is R1010 per month;
- social relief of distress grant. Social relief of distress is the temporary provision of assistance intended for persons who are in such a dire state, that they are unable to meet their families' most basic needs;
- non-profit organisation registration. The NGO Directorate within the Department of Social Development registers organisations under the Non profit Organisations Act, No.71 of 1997. The primary purpose of this Act is to encourage and support organisations in a wide range of work by creating an enabling environment for NGOs to flourish; in other words setting and maintaining adequate standards of governance, accountability and transparency and
- substance abuse treatment. Substance abuse is a person's overindulgence in and dependence on an addictive substance, especially alcohol or drugs. Prevention and rehabilitation programmes are initiated within communities and schools to make learners aware of the harmful effects of substance abuse and how to prevent them (South African Social Security Agency: 2009).

The Department of Home Affairs Department houses regional offices in the cities of Richards Bay and Empangeni and the surrounding townships. These offices are equipped with computers, fax machines, and telephones for communicating with clients and Head Offices. The Department of Home Affairs offers the following services to the public:

- identity – initial issue and reissue of temporary identity documents;
- travel documents - tourist passports, temporary passports, child passports, documents for travel purposes, emergency travel certificates, maxi passports, official passports, crew member certificates, replacement of new format South African tourist passports (for example, tourists who run out of blank visa), replacement of lost/stolen tourist passports, replacement of lost/stolen child passports, replacement of lost/stolen travel documents and the replacement of a lost or stolen maxi passport;
- citizenship - registration of foreign birth, application for naturalisation, application for retention of citizenship, application for exemption from loss of citizenship, application for resumption of citizenship, application for renunciation of citizenship, determination of citizenship status, 'To whom it may concern' letters, and duplicate copies of naturalisation certificates;
- birth – registration of a birth (within 30 days of birth); registration of a birth (late registrations) - after 30 days, after one year, or after 15 years; registration of a birth outside South Africa, and application for a birth certificate;
- adoption – record adoption;
- marriage – registration of marriage, application for a marriage certificate (abridged and unabridged), consent to marriage of a minor, letter of confirmation of marital status and online verification of marital status;
- death – registration of death, application for a death certificate, registration of a death outside South Africa and
- amendments - [re-registration of a child born out of wedlock](#), [placement of a biological father's particulars in the birth registration of his child registered as born out of wedlock](#), [placement of a forename or surname in a birth registration of a person registered without a forename or surname](#), [change forename\(s\)](#), change surname of a minor, change surname of majors, change gender and correction of error(s) (The Department of Home Affairs, 2009:n.p.).

When using the address www.gov.za all the services of government can be obtained and different forms to apply for services are available to those that can access internet. Internet is growing and community telecenters are progressing and reaching remote areas these days.

1.3 Statement of the problem

Since the advent of democracy in 1994, the South African government has pledged to improve the government services rendered to the entire South African population. To reach this goal, the government has implemented a number of initiatives and programmes (such as Vision 2014 and Batho Pele) to enhance service delivery. In order to help attain these ideals, the government has introduced ICTs to most of their departments.

While there is extensive ICT infrastructure (e.g. telecenters, telecommunication systems, computer networks, Internet services, the cellular/mobile industry, GCIS, etc.) in place to improve service delivery to the people, there are still constant complaints from across South Africa, from all the population groups, about weak service delivery.

In response to these complaints, the government conducted a survey within different government clusters, such as the governance and administration cluster; the social, economic, justice, crime prevention, security, and international relations clusters; to determine why complaints continue to persist. The survey revealed that skills, staff capacities and the budget allocated for human resources were the greatest obstacles to the use of ICTs for effective service delivery in the country (Appel, 2007:n.p).

Other problems cited included the fragmentation of services (where people have to visit many offices and departments to satisfy their service needs), inferior turnaround time (government departments were very slow to react to service requests), and the lack of consistent electrical power to deliver efficient services (Gosebo, 2008).

The study, therefore, probed the availability, utilisation and impact that the introduced technologies have made on service delivery, and whether it has brought about any changes in the way that civil servants deliver services to their customers.

1.4 Aim of the study

This study examined the use, availability, interaction and impact of ICTs in three government Departments within the uMhlatuze Municipality, in the context of service delivery.

1.5 Objectives of the study

The objectives of the study included the following:

- to determine the nature of the services rendered;
- to establish the types of ICTs currently in use by the civil servants in uMhlatuze municipality;
- to explore how the civil servants interact with ICTs in the municipality;
- to explore the impact of the civil servants' interaction with ICTs;
- to determine the training needs of the civil servants, in so far as effective ICT utilisation is concerned;
- to determine users level of satisfaction with standard of service delivery and
- to outline the challenges faced in service provision.

1.6 Research Questions

The above objectives were achieved by posing the following research questions:

- What is the nature of the services rendered by uMhlatuze municipality?
- What ICTs are found and utilised in the public sector in uMhlatuze municipality?
- How do civil servants interact with ICTs in these departments?
- What is the impact of ICTs on the departments?
- What are the ICT training needs of the civil servants in uMhlatuze government departments?
- Are users/clients satisfied with the level of service delivery offered to them by uMhlatuze civil servants?
- What challenges are experienced by both civil servants and clients or users in the utilisation of ICTs in civil service in uMhlatuze government departments?

1.7 Significance of the study

The government of South Africa has many issues that still need to be addressed concerning the effective use of ICTs by government departments. For the government to be able to improve on (its) service delivery promises, it needs to be aware of the current status of the

use of ICTs in service delivery. The study would therefore provide government officials with an insight into the current levels of utilization of ICTs and the problems, if any, associated with their use (planning and policy formulation).

Scholars may also find this study of interest, as it could provide them with a good indication of the efficiency of ICTs in service delivery, and how (efficient or inefficient use) can impact on the end-users or recipients of the service. This, in turn, could lead to new research in the field of social informatics.

Although this study was carried out as a requirement towards a Masters Degree in Information Sciences, it has helped the researcher gain extensive knowledge on social informatics, and will be used as a stepping stone towards achieving what the researcher has always envisaged - a Doctor of Philosophy in Information Sciences.

1.8 Scope and limitations

Due to time constraints and the large number of civil servants working for the government departments in uMhlatuze, the researcher limited the study to 3 public sectors, namely the Departments of Education, Health, and Social Welfare, focusing on all the levels of management (i.e. top, middle and lower management) within the selected departments.

Although it would have been interesting to cover all the public sector departments in uMhlatuze, such a project would required more time and resources, which the researcher did not have. Funding constraints also limited the researcher's scope.

1.9 Dissemination of information

According to Blurtit (2006:n.p), dissemination of information is defined as the process of making information available to the general public. The findings from this study are intended to reach as many readers as possible. To do this, several methods will be used, i.e.: Presenting the results at conferences, through seminars and workshops, publication of the findings in refereed journals and providing the university library with copies of the dissertation.

1.10 Dissertation Layout

Chapter 1: The chapter consist of the introduction and background (of the study) – Contextual setting, statement of the problem, aim and objectives of the study, research questions, significance of the study, scope and limitations of the study, dissemination of information, chapter layout, glossary and definition of terms.

Chapter 2: Literature review – The literature review explores research already done by knowledgeable researchers (empirical studies) and academics in the field of social informatics and ICTs.

Chapter 3: Methodology – A detailed description and explanation of the research design and methods, target population, research instruments, sampling, data collection procedures and problems experienced during the study.

Chapter 4: Data Presentation and Analysis – The chapter reports on the data using tabulations, graphs, charts, tables, figures and descriptions.

Chapter 5: Discussion of results – The chapter discusses the salient issues arising out of the findings.

Chapter 6: The concluding chapter provides a summary and then makes recommendations on the study.

References

Appendices

1.11 Summary

The South African government has invested substantially towards making technological infrastructure available for both their own departments and the public to use. From the overview it was clear that a number of services that the departments under study are providing are already using ICT tools like computers and telephones to enhance service delivery. In addition the South African government has introduced ICT initiatives to take the country forward in terms of service delivery.

The next chapter will present the literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

What comprises the literature review for the study are books, journals, conference papers, research publications and to a lesser extent official government publications (which are not academic, essentially). These were all read and consulted to give an integrated review of literature on the study. Busha & Harter (1980:70) define a literature review as “an in-depth analysis, synthesis and evaluation of information sources to gain insight and understanding of the problem under investigation,” According to Neuman (2000:445), this in-depth analysis is based on the assumption that knowledge accumulates, and that we learn from and build on what others have done.

According to Kling (2000:n.p.) ICTs are now so advanced that it is possible for a person to be at the highest point on Earth - Mount Everest - and make a satellite telephone call to anyone in the world. The ICT industry continues to grow at an exponential rate, branching into a wide array of specialties. Key among these, are software engineering, hardware development, networking, telecommunications and Artificial Intelligence (Kling, 1999:n.p.). As each of these branches develops more enhanced products and services, every discipline (particularly science, business and health) finds itself constantly re-examining its ICT needs and (re)adapting ICT tools that are more relevant to its purposes. Kling (1999:n.p.) believes that using ICTs in organisations and society can greatly improve the way we do things. This view is shared by Becta (2003:n.p.) and Veron (2001:n.p.) who see the assimilation of ICT in organisations and society improving the way work and communication is done on a day-to-day basis.

The way in which businesses and governments electronically store, access, and deliver information is critical in shaping the effectiveness of these organisations. To use technologies effectively and efficiently, organisations such as the government need to develop an overall framework and strategy for their application, and have an organisational structure in place to manage the development of the strategies and oversee their implementation. This is particularly necessary given the rapid rate at which these technologies are evolving (Becta, 2003:n.p; Veron, 2001:n.p.).

According to Souter (1999:n.p.) as early as the turn of the last century the influence of ICTs on the daily lives of people can be seen as follow:

- human beings communicate every day of their lives, at work, home, church, in school, etc. currently, ICTs are making this communication easier and significantly faster, for example, in an office environment there is no need to physically go to other offices to talk to a colleague. One simply phones or e-mails the said person and waits for their response through a telephone or computer system.
- ICT is a technology that allows many things to be done in seconds, very cheaply and affordably. Fax and e-mail, for example, are cheaper, more reliable and quicker than alternatives such as post and courier services.
- the speed of evolution makes technology grow very cheap within a short space of time, for example, Personal computer (PCs) are now old technology compared to laptop technology.

According to Spears, Postmes, and Wolbert (2000:n.p.) in organisational applications, the advantages of new communications technology become more evident, particularly in terms of how they improve performances and in their potential to increase productivity. Organizations generally use ICT for three functions:

- as a tool for teamwork;
- as a vehicle for organisational communication and
- as a tool to aid decision making process

Teamwork is one of ICTs' main growth areas, often referred to as CSCW (Computer-supported Co-operative Work). The idea is that technology can make communication very possible for people living in completely remote areas through e-mail and SMSs (Short Message Services). This involves "virtual teams", which often lead to the development of networked organisations. Communication is very significant in all organisations. Without communication, an organisation is "dead" and seriously jeopardised in terms of its productivity (Spears, Postmes, and Wolbert 2000:n.p.).

One can say when combining the above definitions that the term ICT, works around the concepts growth, improvement, communication speed and productivity in as far as technology is concerned. The researcher sees ICTs as tools that organisations use to improve

their growth, increase communication within the society and organizations at a very high speed while doing their business yet cheaper. With ICTs these days information can be shared, and distributed very easily, but it can be highlighted that trained staff are needed to use such technologies.

In this chapter, the concept of IT and ICT, and the historical development of ICTs are reviewed. Attention is also given to the global, African and specifically the South African ICT infrastructure. E-government initiatives in Africa and nationally are also discussed to illustrate the impact of ICTs on governmental service delivery. Lastly, the challenges and opportunities of implementing ICTs in governments for service delivery and communication on a national and international scale are discussed.

2.2 IT and ICT: conceptual analysis

According to De Sutter, (2003:n.p.) Information Technology (IT) is not only about computers, software or services, but about a combination of all these elements, capped with a vision of how technology can help an organisation achieve its goals. When using IT, departments have to do more with less. This unfortunately depends on the skills of the personnel working in the departments, because doing a lot with less (with IT) requires very skilled personnel. Information and Communication Technologies (ICT) have come to play a fundamental role in the daily lives of citizens, revolutionising work and leisure and changing the rules of doing business. To create an associated society would mean utilising technology to delivery public information, services and transactions in a well-organised manner for the convenience of citizens and business organisations (Averweg, n.d.).

According to ITU (2007:11) Information and Communication Technology is a term used to express the convergence of information technology, broadcasting and communications (e.g. the Internet). ICTs are enablers of communication - regionally, nationally and internationally - and of information sharing, knowledge and development (ITU, 2007:11). According to De Sutter (2003:n.p.) ICTs are a compound of various sets of goods, applications and services used for producing, distributing, processing and transforming information.

Holistically, ICTs thus enhance many aspects of the daily lives of a society, for example, patients in hospitals can now get their HIV/AIDS results within an hour, instead of days,

because of the technologies that have been implemented in hospitals. An individual can withdraw money in seconds from a computerised Automated Teller Machine without having to stand in queues waiting for assistance from the banker/teller, and matriculants do not have to wait for newspapers to see their results. If they have their cell phones they just SMS their examination numbers and their results are sent to them.

2.2.1 ICT uses and benefits

ICT applications are useful in facilitating the development of various aspects of society. They can be used in fields like public administration where they enhance the social, economic and political developments of the citizenry in general. They can also be used for rural and urban development; the establishment of telecentres in rural communities, for example, facilitates economic empowerment, while mobile telephony improves communications, enabling rural entrepreneurs to keep tabs with markets that are outside their communities. ICT applications are also useful in the field of transport where they improve road, air and rail transportation. They are especially invaluable in air transport control and the monitoring of freight and day-to-day transport systems. In this category, smart cards in developed countries help facilitate the smooth operation of the transport system (payment for parking meters, identification of authorised parking space occupants, etc.) (Mansel and When, 1998).

Day and Grewan (2003:5) posit that ICTs can also be used to deliver instructions interactively to people with input-processing-output capabilities, which can be used to improve computer tutorials that support the reading and understanding of text. They further state that in Africa, there are ICT technologies emerging, such as human language technology, which use speech recognition software that can process input from different users with very little training. Other technologies, such as text-to-speech technology, can read text from emails, web pages or typed text (Day and Grewan, 2003:5).

Megan (n.d.:n.p.) lists a few uses of ICTs in society as follows:

- **Delivering services:** Services that are currently delivered by ICTs are much improved. For instance, many library users can now renew their books and pay their fines online or over the telephone. Hence ICTs facilitate access to services, allowing, for example, Internet users to search for jobs on the Internet.

- **Sharing innovation:** Through the Internet, users are able to share and exchange information free of charge. Most of this is due to the open source (OS) platform, which allows organisations to get information and mix and expand it so that it can meet the needs of their clients or users. Good and bad practices are therefore shared, preventing organisations from using resources to ‘reinvent the wheel.’
- **Back office processes:** Mobile technologies, such as mobile phones and laptops, can be used to deliver services in remote areas through mobile workers who stay in contact with the main office and allow staff to access and record information when needed
- **Collaborative working:** In order for any organisation to be successful, there must be collaboration between and within various departments or sections within an organisation for efficiency and joint services. ICTs can play a big role in making the communication and sharing of information possible, not just between public service providers, but also with users.
- **Reaching users:** It is the right of every citizen to receive proper public services. The Internet provides access to ‘hard to reach’ individuals by transgressing geographical boundaries to bring together individuals with niche interests, thus giving them a stronger voice. With the usage of ICTs a lot could be done much easier than it has been the case in the old days for example, long time ago it took 3-4 months to communicate with a person abroad, but now with the introduction of emails it can only take seconds to communicate with that person (Megan n.d:n.p).

According to Sopchokchai (2004:n.p.) ICT benefits may include:

- convenience: improved access, less time consuming interaction;
- customization: service offerings tailored to suit citizens` specific needs;
- improving transparency and built trust;
- more active citizen interaction and democratic participation in decision-making process and
- improved public service

Both authors thus agree that ICTs are improving the way business is done specifically in terms of terms of access, delivery and saving of time.

2.2.2 IT uses or benefits

According to Borade (2009:1) the following may be seen as IT benefits:

- **globalization** – interdependent system has made sharing of information universally to be easy and has ended linguistic problems in different continents. Through IT communication is not cheaper but is available 24/7.
- **computerised Internet business** – IT has made a lot of businesses to go to the Internet for their own productivity and to increase their number of clients, since using/surfing the Net is much easier and cheaper. Even people in isolated (remote) areas are able to get into Internet and do business.
- **communication revolution** – IT has made specialist from different field of work to be able to expand their system, programs, and businesses at the same time through the use of IT which they can use at any time.
- **low cost business options** – the use of emails, telephones, cell phones etc has made communication to be easy. When organisations do business they communicate via emails in seconds and the business is done.

2.3 Background to ICT development

2.3.1 Computing History

“A computer is an electronic device, operating under the control of instructions stored in its own memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use” (Cashman, Shelly and Vermaat, 2007:6).

Mechanical relays were the switching units that were utilised in 1940s in Computers. They work in such a way that they were opening and closing while doing the calculations. It is said that Mechanical Relays were used in Zuses machines of 1930s. History tells us that around 1950s the Vacuum Tubes took over from Mechanical Relays. The Vacuum Tubes were used in Atanasoff-Berry Computer (ABC) as its switching units instead of relays. This was a very huge technological advance since vacuum tubes could perform calculations significantly and more proficient than relay machines. Unfortunately, this technology could not last long because they could not be made smaller than the way they were made and they had to be put closer to each other because of their heat generation. The transistor came into the picture as

was highly recognised as a revolutionary development. The development of this device was seen as a result of series of developments in the applications of physics by many authors from “Fire in the Valley,” Transistors changed computers from being a big machine into a commodity like a Television set, thanks to the three scientists: John Bardeen, Walter Brattain and William Schockley (Muganda, 2001:2).

The integrated circuit, which was invented and introduced in the 60’s, is a very small silicon computer chip made up of even smaller transistors, diodes and resistors (Sexton, 2007:n.p.). The microprocessor differed from its predecessors because thousands of smaller integrated circuits could now fit onto a single silicon chip. This progress led to the eventual development of a mouse and keyboard. The chips also paved the way for the development of RAM (Random Access Memory), which allows data to be stored and updated on a chip (Sexton,2007:n.p.). Various other technological developments have since seen microprocessor technology evolved to the point where we witnessed the birth of the new HP touch smart PCs in the year 2008 (E-week channel Insider, 2008:n.d.). This system gives users access to information by tapping or sweeping their fingers across a screen, providing consumers with special features for music, photos, and web access e.g. the iphone.

2.3.2 Telecommunications history

Telecommunication is the exchange of information over significant distances via electronic means (Telecommunications, 2008:1). The history of the development of telecommunication dates back to 1700, when Claude Chappes invented the Semaphore - a windmill-like structure that enables people to relay messages at distances of up to 20 miles (Tyco telecommunications, 2006: n.p). The extraordinary technological advances of the 19th century brought about sweeping changes, many of which were made possible by the introduction of mechanically generated electricity in 1832. With this ability (i.e. to flow electrons down copper wire), European inventors Wheatstone and Cooke, and right behind them, Morse and Vail in the United States, developed the telegraph. And so the telecommunications industry was born (Tyco telecommunications, 2006: n.p.).

Developments and new initiatives in telecommunications have experienced phenomenal growth over the last few decades, from 56-kbps modems which are now available for high-speed communication over standard telephone lines to the development of Virtual Private Networks (VPNs) based on L2TP and IP security techniques. There is also the Backbone

Network Service (vBNS), which implements connectivity for the next-generation Internet using IP-over-ATM and runs on a SONET 622.08-Mbps platform, and the growing maturity of desktop video-teleconferencing (VTC) and cable modems that could exploit cable television connectivity (Benato, n.d.). Other significant developments have been the establishment of Internet Protocol version 4 (IPv4) for reliable transmission over the Internet in conjunction with the Transport Control Protocol (TCP), and the standardisation of Asymmetric Digital Subscriber Lines (ADSL) using discrete multi-tone techniques to allow greater services to be provided over the Plain Old Telephone Service (POTS) (Tyco telecommunications, 2006: n.p.).

ADSL is a high-speed communication technology that allows one client modem, like that at a remote terminal (RT), to be connected at one central office (CO) modem through one twisted pair telephone line forming a loop. ADSL modems transmit digital data at a high rate over existing twisted pair telephone lines that unite customers to digital networks. Duplexed ADSL modem transmits in one frequency band and receives in a second, disjoint frequency band. ADSL modems can use two competing modulation schemes: discrete multi-tone (DMT) and carrier less amplitude or phase modulation (CAP). Discrete multitone (DMT) is a modulation technique commonly employed in various digital subscriber line (xDSL) communication systems (Electronics information online, 2007:1). According to Helmig (2001:2) there is a difference when downloading a file using ADSL and V.90 modems: when using V.90 modem it can approximately be 5.7 Kilobyte/sec, while with ADSL approximately it can take 90-100 Kilobyte/sec. this proves that ADSL is very fast in terms of speed.

In 1998, Ericsson, IBM, Intel, Nokia, and Toshiba announced joint operations to develop Bluetooth, which now allows wireless data exchange between handheld computers or cellular phones and stationary computers; in the same year, 1000BASE-T standardisation for 1 Gigabits per second (Gbps) Ethernet was initiated (Benato:n.p). Present day developments in telecommunications are unabashedly moving forward, and in the process radically influencing the way people communicate and send information locally, nationally and across borders (Benato:n.p).

IPv4 technology is now replaced by the Internet Protocol, version 6 (IPv6) which is believed to be the future of Internet. The impetus for the creation of IPv6 was because of the following problems encountered when using IPv4 technology:

- the exhaustion of the IPv4 address space;
- the exhaustion of the capacity for global routing tables;
- complexities in configurations;
- poor security at the IP level and
- poor delivery of real-time data (Kumar 2006:1).

The IPv6 creation will thus aims at the elimination of all the above mentioned problems, especially since The IPv6 technology increased the number of bits for addressing. It uses 128-bit addressing expressed in hexadecimal format, as opposed to IPv4 which used 32-bits. The advantages of using IPv6 are as follows:

- efficient management of address space;
- enhanced security support;
- easy maintenance of administration TCP/IP;
- elimination of the network address translation (NAT) role and
- better mobility support (Kumar, 2006:1).

2.4 Global ICT infrastructure

According to Kling (1999: n.p) ICT infrastructure is the backbone of all ICT applications. Adequate ICT infrastructure should contain, on average, most of the following:

- equipment, which may include stand alone and/or networked computer hardware, modems, local area networks, etc;
- intranets or a campus wide backbone connecting LANs (local area network) and multi-organization networks;
- operating systems;
- accessibility;
- carrier Technology, e.g. satellites technology such as VSATs (Very Small Aperture Terminal) and wireless radio and television;
- fiber-optic technology, unshielded twisted pair, and coaxial technology;
- sufficient bandwidth and routers availability are important in ensuring that all information products can be accessed efficiently; and
- functionality, i.e. email, Internet access, conferencing tools, multimedia tools, etc. (Kling, 1999: n.p.)

Huge investments in ICT infrastructure in mainly developed countries have contributed to great advancements in the utilisation of ICTs, both for business and service delivery purposes, and for private utilisation.

According to Pavlotsky (2008:n.p) Russia spent over 10 billion on ICT products in 2008. Russian small and medium businesses (SMBs) have also invested heavily in highly technological computer systems. Consequently, Russia has proved to be the highest spending ICT country in the region.

According to Mait (2008:n.p.), the ICT industry in Japan has extended its focus far beyond the manufacturing of equipment to furthering maintenance and management services and creating audio, video, print and digital content. These new developments are going to boost the ICT market in Japan. Japan is ranked 2nd in the world (with 72.7%) by the ICT Industry Competitive Index. Japan's ICT infrastructure has been developing at a rapid rate over the past few years. It has featured the fastest broadband connection speeds and highest Internet penetration rates globally. Owing to these developments, the country has witnessed the very quick assimilation of multi-function mobile telephones, which contain cameras, barcode readers, music players and contact-less payment functions, and has seen an exponential growth in the number of people using the Internet (Mait, 2008:n.p.).

Japan has over 100 million mobile phones subscribers, which is nearly 80% of its population, and is leading the way in third-generation (or 3G) mobile telephony. Japan has introduced the Mobile Number Portability (MNP), which allows customers to keep their new number when switching to a new carrier. The country is also rising in video conferencing and other means of visual communication. A lot of companies and organisations are opting for video conferencing to do their operations and improve internal communications (Mait, 2008:n.p.).

Nielsen (2007:n.p) posits that the United States is still the world's technological powerhouse, confirmed by the results of the Networked Readiness Index (NRI). The US is said to be a Global leader in the ICT industry because of the quality of its market environment for ICT. The country has improved a lot in its ICT infrastructure, ICT penetration and the use of e-government.

According to the United Kingdom (UK) Trade and Investment Services (2008:n.p), the UK is another example of a global leader, with stronger ICT infrastructure than countries like Germany, France, Italy and Spain. In the UK, the privatisation of major ICT service providers led to greater competition and lower prices. This has strengthened the ICT infrastructure that is necessary for companies to prosper, such as e-business, availability of broadband, availability of Wi-Fi, and the provision of secure servers.

The E-readiness Rankings placed the UK among the top 10 countries in the world based on the results compiled by the Economist Intelligence Unit (EIU). These rankings measure economic, technological, political, infrastructural and social factors that relate to the development of e-business. The UK has a 24.9% penetration rate of broadband technology, which is the highest percentage compared to the European Union average of 20%. Broadband subscribers in the UK enjoy the second highest number of verified Wi-Fi hotspots globally behind the US. The UK also has the highest number of secure servers in Europe, and is 3rd globally behind the USA and Japan (UK trade and investment services, 2008:n.p.).

2.5 ICT infrastructure in Africa

According to Mutula and Van Brakel (2007:231) ICT, mostly the Internet, has a very important role on the operations of businesses and is declared to be vital for the survival and economic escalation of many countries. Looking at ICT usage in Africa it can be noted that there are barriers that hinder the use of ICT in the continent, for example: Rizk in Mutula and Van Brakel (2007:236), in the study of e-readiness of the business sector in Egypt, established that the reason for the poor usage of ICTs were unqualified personnel and the lack of awareness on ICT usage or technology. They further state that for that reason the government of Egypt has included computer learning in many schools and universities in the country, so as to build a skilled based society.

ICTs are a powerful way to boost economic growth and initiate poverty reduction in Africa. ICTs increase efficiency, provide access to new markets and services, create new opportunities for income generation, and improve governance by giving a voice to the poor (Lisham, 2008:1).

According to Lisham (2008:1), the current spread and use of ICT in Africa depends on a number of factors, namely:

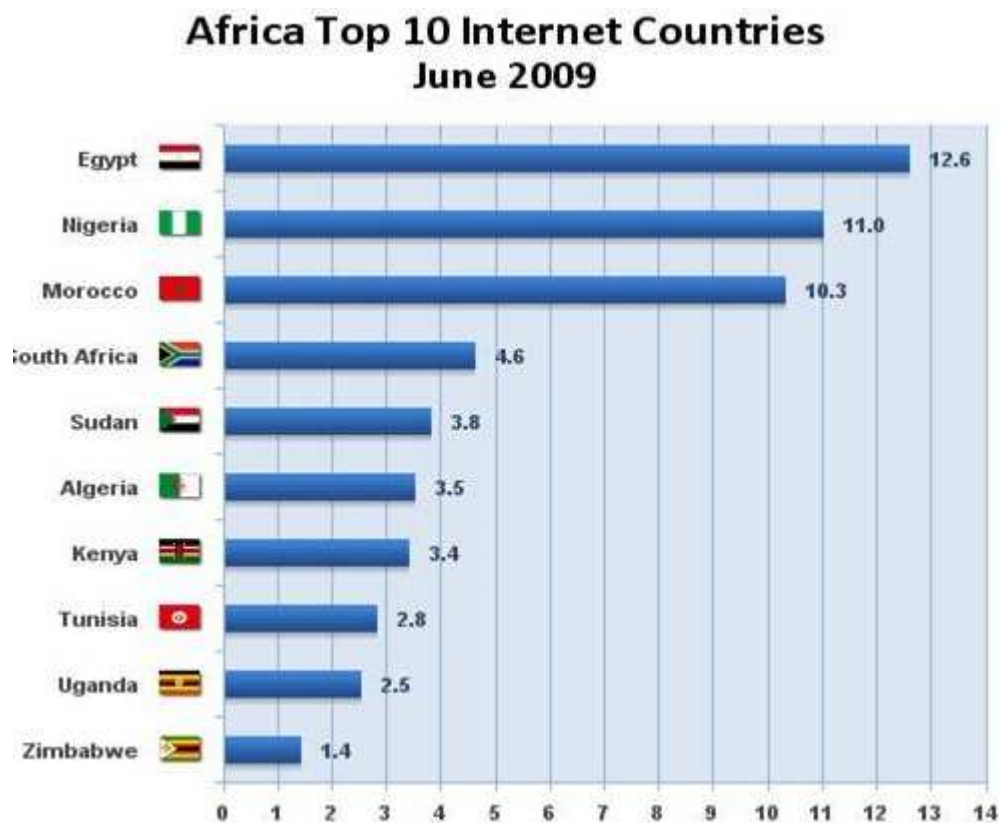
- **infrastructure** – its availability, operation and maintenance. This includes not only ICT infrastructure, but also transport and electricity.
- **access** – characterised by public access facilities, the existence of relevant content, adequate capacity at different levels, and promising experiences with respect to mobile telephony.
- **supportive enabling environments** - includes specific regulatory frameworks and an overall policy framework that promotes sound economic and political governance (Lisham 2008:1).

For governments to utilise ICTs for their own administrative functions, as well as, for service delivery and information dissemination purposes, these tools (Intranets, databases (online), telephone, mobile phones, television, radio, video cameras, video recorders, sound or tape recorders, overhead projectors, fax machines, digital cameras, printers, scanners, data projectors, diskettes, copy machines, etc.) need to be available to the government workers as well as to the citizenry in general (Van Brakel and Chisenga, 2003:n.p.).

Africa has many different types of modern ICT infrastructure available, such as satellite-based telephony, mobile cellular phone services, digital satellite television, computers, facsimile services, satellite radio services, and many more (Van Brakel and Chisenga, 2003:n.p.). However, Africa is still behind compared to the rest of the world in terms of ICT infrastructure and development, as explained below.

Although Africa has shown major improvements in ICT technology due to the arrival of mobile telephony, it is still behind the rest of the world. Tanzania, in East Africa has made major improvements in ICT development, especially in mobile telephony, and the reason behind its success was the regulatory policies and governance. Although Tanzania is one of the small countries in Africa, but it was seen as the Pioneer in the Sub-Saharan Africa because of the good governance and regulatory policies in as far as ICT market development is concerned (Maitland and Van Gorp, 2008:64). The figure below indicates how Africa is seen in as far as Internet usage is concerned. Although South Africa is regarded as the top country in terms of infrastructure, the latest Internet stats indicate that it is number 4 on the list.

Figure 1: Internet usage by top 10 African countries



2.5.1 Telecommunication facilities

According to NEPAD's ICT infrastructure programme (n.d), a number of factors hinder the economic participation of Africa in the world, and these include:

- the high cost of access for end-users to foreign-owned satellite telecommunication providers for cross border, regional and international telecommunications ;
- high internet costs;
- low bandwidth;
- poor ICT infrastructure and
- unreliable communication facilities.

NEPAD, through its Heads of State and Government Implementing Committee (HSGIC), introduced measures to try and improve the way ICTs are functioning. The NEPAD ICT infrastructure programme was introduced to oversee the completion of a fibre optic ring around Africa, connecting all African countries and the world at large through submarine cable systems (NEPAD ICT infrastructure programme, n.d.). The key features of the NEPAD ICT infrastructure programme are:

- the establishment of a submarine cable for East Africa (EASSy). This cable will complete the fibre optic ring around the African coastline in conjunction with other similar submarine cable systems and
- the rationalization and development of the ICT Broadband Network for East and Southern Africa, as well as for Central, West and Northern Africa - connecting these countries with their neighbors, ensuring that each land-locked country is connected to at least two cable landing stations (NEPAD ICT infrastructure programme, n.d.).

2.5.2 Desktop Computers

Many people around the globe have PCs in their homes and in their work places, but this is not the case in Africa. In fact, the availability of desktop computers in Africa is the lowest compared to the rest of the world. Statistics provided by the International Telecommunications Union (ITU) indicate that in 2002, Africa had 1.23 desktop computers per 100 inhabitants (Van Brakel and Chisenga, 2003). This is in sharp contrast to 3.95 for Asia, 20.01 for Europe, 27.49 for the Americas, and 38.94 for Oceania. This dismal number can be attributed to the high cost and low earnings of most people on the continent. Another reason for the inability of African organisations to afford computers is that the import rates and sales tax imposed on computers is very high; computer prices in the developed world have gone down, but not in African countries (Van Brakel and Chisenga, 2003).

2.5.3 Telephone Facilities

Currently Africa has poor fixed-line infrastructure, and this has resulted in a high growth in mobile penetration (Africa - Pan-African Operators: 2008). In fact, Africa's telecoms future is predicted to be bright, with opportunities for service providers, equipment vendors and investors. For example, in early 2007, Africa experienced a growth of 90 percent in telephone subscriptions, resulting in over 35 million fixed lines available for use by the end of that year ITU (2007:n.p), Despite this growth, wireless solutions are increasingly used to serve as substitutes for the inadequacy of fixed-line infrastructure (Gray 2008:7; Paul Budde Communications, 2007:n.p). According to ITU (2007:n.p), 93.3% of telephone owners are mobile telephone consumers, and 1.7% are fixed-line telephone users. Communication at the work place is now mainly being performed through the use of cellular phones. The use of

mobile phone services has also become more attractive to most people because of their value added services, e.g. data transmission, short message sending (SMS), WAP-based internet access, and even financial transactions (Jensen in van Brakel and Chisenga, 2003).

2.6 ICT infrastructure in South Africa

2.6.1 ICT policies

The South African government's policies in relation to ICT are founded on two major pillars:

- the first is that ICTs are there to make sure that services to the people of South Africa are delivered faster, cheaper, better and in a sustainable manner to all its citizens; and
- the government's policy is that ICT tools and information are key drivers of economic and societal development. This simply means that ICTs should create a better life for the people of South Africa (The Presidency, 2007:1).

2.6.2 Mobile or cellular telephony

The cellular industry in South Africa has witnessed tremendous growth over the years, and currently there are four mobile operators, namely: Vodacom, MTN, Cell C, and Virgin Mobile. All the operators have experienced tremendous growth over the past few years. Table: 1 shows the number of subscribers registered with each operator.

Table 1: Cellular subscribers

Cell C	MTN	Vodacom	Virgin Mobile
6.4 million	90.7 million	39.6 million	603.000

Sources: Mochiko (2008), SA yearbook (2009/10:113), Webb (2009), Wireless Federation (2009)

2.6.3 Broadcasting (RADIO AND TV)

2.6.3.1 Radio

The South African Broadcasting Corporation SABC, the country's first public broadcaster, had its first news broadcast on the 17th of July 1950. The daily news bulletin at the time was only in English, Afrikaans Radio. Ten years later, on the 1st of June 1960, Radio Zulu, Radio Xhosa and Radio Sesotho were added to its repertoire. In 2007, the SABC's national radio

network consisted of 15 public broadcast-service radio stations and three commercial radio stations, broadcasting in 11 languages; as well as an external radio service in four languages that reached an average daily adult audience of 19 million. SABC News provides news and current affairs services to both SABC radio and television. There is a public broadcasting-service radio station for each language group (SA yearbook, 2008:120).

2.6.3.2 Television

On the 5th of January, 1976, a single channel television service was initiated in South Africa. Today, the SABC television network consists of three full-spectrum free-to-air channels and one satellite pay-TV channel aimed at audiences in Africa. A daily adult audience of almost 20 million people is reached via the terrestrial signal distribution network and a satellite signal. 2008 recorded four million licensed television households in South Africa (SA yearbook, 2008:121).

More than 60% of the programmes transmitted via the SABC are produced in South Africa. Television news is supplied by SABC news teams which report from all parts of the country using modern portable electronic cameras and line-feed equipment through more than 220 television transmitters. 18% - 20% of the SABC's terrestrial television channels' airtime is donated (during prime time) to news and news-related programmes (SA yearbook, 2008:121).

MultiChoice launched high definition television (HDTV) in the South African market, the first of its kind in Africa. HDTV has a resolution of 1280 x 720 or more, which is almost the double of standard TV. The two types of HDTVs are LCD and plasma (Da Silva, 2008).

2.6.3.2.1 E-TV

E-TV is South Africa's second-biggest privately-owned television channel, with an average viewership of 10 665 000. The channel appeals to viewers of either gender (54.1% male and 45.9% female) across all races and income and age groups (SA yearbook, 2008:122).

2.6.3.2.2 M-Net

M-Net was launched in 1986 and is South Africa's first private subscription television service. M-Net channels are delivered through analogue terrestrial and digital satellite

distribution, and offer movies, sport, children's programmes, international and local series, and local reality shows.

MultiChoice Africa (MCA) was formed in 1995 to manage the subscriber services of its sister company, M-Net, and became the first company on the continent to offer digital satellite broadcasting. Operations include subscriber-management services and digital satellite television platforms, which broadcast 55 video and 48 audio channels, 24 hours daily (GCIS in Kwake, 2007:62).

2.6.4 The Internet

The Internet has become a mainstream form of media and an integral part of modern life. The Internet market research company, Nielsen//Net, has noticed that the number of South African citizens registered online has grown by up to 121% over the last few years. In May 2007, some 3, 9 million active unique browsers were registered in South Africa, representing a 121% increase on the number in May 2005 (SA yearbook, 2008:115). By the end of 2007, South Africa had registered at least 7.8 million users, which is an increase of about 163 percent (Finn, 2008:n.p.).

In South Africa, men constitute the majority of Internet users at approximately 54% (2.15 million) of the total Internet population. In terms of age, the 25 - 34 year-old group dominates, constituting around 36% (1.42 million users) of the online population. The second largest group, the 35- to 49-year olds, amount to a further 35% (1.37). The majority of the Internet population speaks English and most of the online content is in English (SA yearbook, 2008:115).

According to ITU (2008:n.p), South Africa has exceeded the 1 million broadband subscriber mark. Telkom has 415 000 ADSL subscribers, Vodacom has 360 000 3G/ HSDPA data card users, while MTN has 120 000 3G/HSDPA data card users on the South African network. The total number of ADSL and HSDPA subscribers amounts to 895 000.

2.6.5 Telecommunications Context

South Africa is a leader in ICT development in Africa, and the 20th-largest consumer of IT products and services in the world. The country has a network that is 99% digital, and includes the latest in fixed-line, wireless and satellite communications. As such, it has the

most developed telecommunications network on the continent. Several international corporations, recognized as leaders in the IT sector, operate subsidiaries from South Africa (SA yearbook, 2008:112).

2.6.5.1 Telecentres

Telecenters have been praised as part of the solution to development problems around the world because of their ability to provide access to ICTs. A large number of telecenters have been introduced and implemented by different governments and organisations around the globe. One category of telecenters are referred to Multipurpose Community Telecenters, which provide public access to a variety of communication and information services. These centers are especially seen as narrowing the “digital divide” in remote, rural and disadvantaged communities (Dymond and Oestmann, n.d; Cole and Roma (2001:2).

Examples of a few South African Telecenters include:

- **Gaseleka Telecentre.** This was the first telecenter to be established by the South African Universal Service Agency (USA) in 1998. Gaseleka started out by only offering access to equipment. It has since branched into various other services according to need and opportunity. Most people come for phone calls, sending and receiving faxes, and photocopying. Schools in the area use it to bulk-copy question papers and reports and/or type curricula, reports and schedules on computers. Computer training is a major service provided by the Gaseleka telecenter (Benjamin, n.d).
- **Wudinna Telecenter.** This service center caters for the Central/Northern Eyre Peninsula. It was started as a small office that introduced modern technology to rural people, and this remains the main focus of the center. It offers services such as printing and teaching computer literacy to the local community (Parker, 2004:1).
- **Mamelodi Telecenter.** This centre is situated in the Mamelodi Township in Pretoria, also known as the Mamelodi Community Information Services (MACIS). The centre trains the community and facilitates training (and enjoys good community networks. The greatest challenge the centre faces is that illiterate people (the ‘target’ community) do not visit the centre because they are not skilled enough to use the technologies available in the centre (Cole and Roman, 2001:57).

In contrast, public ICT access centers are very diverse, varying in the clientele they serve and the services they provide. Some are for-profit, such as private-sector cyber cafés. These cater for those who are able to pay for the time spent online and are fairly popular with the youth, who play computer games, Net surf or chat online (Fontaine, n.d).

2.7 ICT infrastructure in uMhlatuze Municipality

Umhlatuze municipality has relatively well developed ICT infrastructure, supported by the general ICT infrastructure available in South Africa. The ICT infrastructure found in the uMhlatuze municipality includes the following:

- computers in virtually all businesses and offices;
- telephones lines;
- fax machines;
- copy machines;
- internet connection lines/points provided by Telkom;
- mobile phone technology and cell phones are available either on contract or as a pre-paid option and
- a number of shops selling or maintaining ICTs.

2.8 E-government

E-government refers to government agencies' utilisation of ICTs that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends, e.g. better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. Possible net benefits include less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions (The World Bank, 2008:n.p.). UNESCO (2008: n.p) confirms this, by describing e-governance as the public sector's use of ICTs to improve information and service delivery, encourage citizen participation in decision-making processes, and make governments more accountable, transparent and effective.

Government departments should be able to service people efficiently. Since they are the biggest service provider in a country, the government should ensure that all people,

irrespective of race, religion and/or education, receive equal treatment, services, and access to information. The ICT tools used in e-government should, therefore, be able to reach all people, even in remote areas. ICT tools provide citizens with a platform to voice their complaints and concerns, even when they are not able to contact government offices directly. Citizens should, for example, have access to the telephone numbers of the various departments, and their e-mail addresses and cell phone numbers, so that they can communicate with civil servants at any time (Royal Government of Bhutan, 2006:n.p).

According to van Jaarsveldt and van Rooyen (n.d.), when a government decides to introduce e-government into its service delivery systems, it should first ensure that the general mindset of the public servants is fine with the changes, because people normally fear change, especially with new technologies. The government should also engage with the public to inform and convince them about the importance and advantages of e-governance and the ICTs that enable it.

In order for e-government to make an impact on service delivery, there needs to be collaboration and partnerships between all parties involved, i.e. customers, the government, private organisations, businesses, and so on. Farelo and Morris (2006.) view e-governance as a participatory process that requires continuous input and feedback from the customers (the public, businesses and officials who use e-government services), who voice their ideas for the improvement of services.

According to IDABC European e-government services (2007:3), the vision for e-government should address three main domains:

- E-government : the application of IT intra-governmental operations (government to government or G2G);
- E-service : the application of IT to transform the delivery of public services (government to citizens or G2C) and
- E-business : the application of IT to operations performed by government in the manner of G2B transactions (e.g. procurement).

2.8.1 E-government applications

IDABC (Interoperable Delivery of European e-government Services to public Administrations, Businesses and Citizens) European e-government services (2007:10) defines an e-government application as any interactive public service that is delivered electronically and offered either entirely or partly by public administration or with the authorisation of public administration for the mutual benefit of the end user (which may include citizens, legal persons and/or other administrations) and the public administration. Any form of electronic service, including stand-alone software, web applications, and proprietary interfaces offered locally (e.g. at a local office counter using an electronic device), can be considered to be an e-government application, provided that a certain degree of interactivity is involved.

According to Link Centre (n.d.), the following types of e-government applications can be found in any government structure in the country:

- electronic administration – strengthens government to government (G2G) interactions for more efficient internal processes;
- electronic services – strengthens the delivery of public services to citizens and the business community;
- electronic business – strengthens the business interactions between the government and the business community (G2B);
- electronic citizen – strengthens the interaction between the government and the citizens (G2C), thus permitting citizens more active participation in governance and democratic processes and
- electronic society – strengthens interaction between government and the civil society, thus ensuring more efficient and effective partnerships in service delivery and democratic governance.

Doorgapersad (n.d) believes that e-government applications can help fight corruption and bribery, improve citizen empowerment and participation, enhance accountability, and increase service delivery.

Different countries and governments have engaged themselves in different e-government initiatives and examples therefore abound. Some examples are briefly presented below to illustrate how e-governance is applied in various countries and cities:

- **South Africa.** In South Africa, e-government projects like the Gateway portal, one-stop shops, etc, enhance service delivery and reduce red tape. Through these projects, citizens are able to interact with the government without untimely restrictions (Doorgapersad,n.d). According to IDABC European e-government services (2007:4), the South African Department of Home Affairs also wishes to re-define the relationship between the government and SA's citizens. A smartcard-ID that automates fingerprints is under development, and the development of an electronic Population Registry is also under way. Through its Home Affairs National Information System (HANIS) project, citizens can access birth and death registration forms online. For the country, the extent to which transparency, accountability and predictability (of rules and procedures) are made priorities will determine how much e-government will work against corruption.
- **England (the Portsmouth intelligent transportation).** The city of Portsmouth in England started its PORTAL (Portsmouth Online Real Time Traveller) in 2004. The aim of the project was to improve the public transportation services to its bus users, estimated at 41 000. The PORTAL uses a wireless broadband (Wi-Fi) network that transfers information and Internet services to bus shelters equipped with displays and touch screens. Data is collected from On-Board Units (OBUs) from 300 buses, and is then wirelessly transmitted to central servers at the Portsmouth City Council Traffic Control Centre (TCC). The information is then transmitted to bus shelters providing the users with a range of services, including bus arrival times, timetables, free e-mails and a wide range of travel and information services. The network is said to be less expensive to operate than using GPRS technology (Matson, 2006: n.p.).
- **Canada (the Tillsonburg innovative service delivery).** The town of Tillsonburg in the city of Ontario in Canada improved its operations and delivery of services through its broadband network initiative. This town received an award for being the best in providing e-government services to its community. The e-government initiative was introduced because the town's internal communications and non-

integrated financial and management systems were paper-based, which led to delays in the delivery of internal and external services. Factors that led to the systems' success were connectivity, leadership, training, IT planning, and speed of operations (Matson, 2006: n.p.).

- **Texas (Corpus Christi).** The city of Corpus Christi in Texas has introduced its own network to computerise municipally owned utility services to reduce costs and achieve improved operating competences. The Automated Meter Reading (AMR) system and wide broadband network were introduced by the Northrop Grumman Corporation to the city. The network was introduced for general purposes and public safety. The network equips the city with the AMR system, collecting water meter data from residential properties and businesses. The network transmits data over the city's wireless network to the customer information and billing system. The city is expected to save significantly through this network because field personnel will no longer be required to manually read meters every month (Matson, 2006: n.p.).

2.8.2 E-government – challenges and opportunities

According to Coleman (n.d.), e-governance offers opportunities for at least ten major administrative and democratic improvements, i.e.:

- cheaper and more effective management and processing of information;
- the free flow of information across departments, agencies and layers within government;
- more professional administrators, supported by standardized, electronically-embedded decision-making systems;
- the routine provision of services according to impersonal rules, as opposed to client's arrangements;
- transparency, particularly in relation to the procurement of government services;
- opportunities to work in partnership with the private sector in modernizing governmental processes;
- the free flow of information between government and citizens;
- the strengthening of intermediary democratic institutions, such as parliaments, local government, civil society organizations, and the independent media;
- opportunities for citizens to participate more directly in policy development and

- opportunities to combine traditional and modern methods of accountability (Coleman, n.d.).

According to the EDC Center for Media and Community and the NYS Forum (n.d.), the challenges facing the proper implementation of e-government in society are as follows:

- **A ‘disconnect’ in e-government and digital divide policies.** There should be a study to check the needs of the underserved or marginalised communities concerning the need for e-government, since the lack thereof could lead to failure or improper implementation. A strategy should also be in place to try and close the digital divide between government and under serviced communities.
- **Unnecessary bells and whistles.** Government online services should be designed such that they are easy to access; user-unfriendly services tend to discriminate against physically disabled people, people with limited bandwidth, and people with poor IT skills.
- **Lack of accessible standards.** The formats that are implemented by policy makers in government documents should be easy to access.
- **Insensitivity to readability levels.** When creating documents for the public, the government should ensure that they (the documents) are in a readable format that is appropriate to the targeted public.
- **Linguistic barriers.** The government should see to it that the documents created for public use are in a language that every citizen of the country can understand, irrespective of whether they are a majority or minority in terms of the population.
- **E-government facility user-unfriendliness.** The government should ensure that e-government facilities are as user friendly as possible to avoid confusion on the side of the user.
- **Obsolescence of equipment.** The government should move to new technologies once they are available, as by doing so, effectiveness and accuracy are improved.
- **Funding challenges.** Technology is expensive and needs to be maintained at all times; hence government should make sure that there is funding in place for e-government facilities.
- **Non- engagement of the private sector and civil society.** The government cannot afford all the costs alone, especially since technology requires some expertise that

the government might not have. Support from the private sector and non-governmental organisations are therefore essential.

- **Lack of public engagement.** The general public tends to avoid dabbling in government activities, so failure to encourage public participation in e-government programs could lead to a widening of the digital divide that exists between the government and the public it is serving (EDC Center for Media and Community and the NYS Forum n.d.)

According to Gosebo (2008:n.d.), while the South African government has implemented a number of e-government initiatives, there are still some additional challenges that hinder the proper implementation of e-governance within the governmental context, such as:

- **A fragmented government service.** An example would be when a person wants to register a company and does not know which department to go to, since two or three different departments is allegedly involved. Once located, lack of knowledge about the processes and procedures of that department make it very difficult to quickly complete the process.
- **Poor turnaround times.** Theoretically, many documents can and should be ready in a short space of time, only to find that it takes weeks or months for the documents to be processed. For instance, when applying for an identity document, in theory it should take hours, but practically it takes one to 3 months.
- **Access.** – There is a big problem with access, for not all citizens or government officials have access to ICT tools or know how to operate them efficiently.
- **Power failures.** The manufacturers of ICT tools assume that everybody in South Africa has full access to power. However, interruptions to the electricity supply create huge problems for businesses and individuals reliant on ICTs for service delivery and communication. Large communities are also still generally facing problems with lack of electricity and can therefore simply not fully utilise ICT tools.

2.9 Government and service delivery

The Environmental Service Delivery in South Africa (n.d.) defines a service as an activity or action that satisfies a person's needs. Public service delivery is there to improve the lives of the public in matters of policy, for which a particular public service organisation (e.g. municipality) is officially responsible. Electronic Service Delivery (ESD) is a method used to

deliver services and conduct business with customers, suppliers and stakeholders to achieve local government developmental goals of improved customer services and business efficiency in a sustainable way (Averweg, n.d).

The use of ICTs has been an instrumental factor in changing and renovating public administration, particularly because ICTs provide it with a faster means to access accurate information. New technologies, therefore, pave the way for a different type of governance. Electronic governance has as its goal the improvement of internal administration processes, the rendering of better public services, and diminishing the gap that separates government from society (Dmochowski, 1996). This requires civil servants to adapt and be able to utilise ICTs effectively in their service delivery to the general public, although some ICT tools are not always user friendly (fax machines, for example).

In terms of IT, Dmochowski (1996) argues that it is very important to differentiate between the availability of information, accessibility thereof, and the ability to utilise it. Civil servants cannot only focus on new IT to transfer data in the line of 'state-to-citizen', because they should be aware that groups of citizens might be curtailed by low literacy levels, weak telecommunications infrastructure, cost, etc. Civil servants therefore must not provide citizens with too many forms of e-government, e.g. online chat forums, meetings, voting, debates, petitions, and so on; because potential users may experience problems in identifying their required services and subsequently become very discouraged (Dmochowski, 1996).

2.10 Government and service delivery in South Africa

The Environmental service delivery in South Africa (n.d.) notes that the constitution of South Africa goes further than other countries' constitutions in guaranteeing the right to basic services for all South Africans. Every individual has the right to have access to health care, sufficient food and water, sanitation services, electricity and social security. These services are the responsibilities of the local sphere of government. The provincial sphere of government has the primary responsibility of social service delivery.

Social service delivery involves, for example, the provision of health services, education, housing and social development. The provincial government therefore plans, budgets for, and implements programmes aimed at delivering a broad range of services directly to people.

On a much broader scale, there is the national sphere of government, which is responsible for functions that affect the whole country or that require uniformity. This sphere's responsibilities include foreign affairs, safety and security, defense and home affairs. The national sphere of government develops policies that guide service delivery in the provincial and local spheres (such as broad education policies). The national government then monitors and supports the implementation of these policies. It is also bound to deal with issues that arise between the provinces (Environmental service delivery in South Africa: n.d.).

2.11 Training needs for effective ICT use and effective service delivery

For civil servants to effectively use ICTs to deliver services to the public, and for the public to benefit from these services and be able to use e-governance, skills that allow both parties to use the available ICTs are necessary. According to South Australia Government (2006:n.d), ICT training is very important, especially in remote areas where there is a great need to increase the acceptance of online information and services. Training and skills development should therefore certainly include Internet and computer training.

The Presidential National Commission on Information Society and Development (2008:n.d.) points out that South Africa is in dire need of e-skills development for service delivery and developmental purposes. The commission suggested 3 categories of e-skills that should be mastered:

- ICT skills for modern life outside the workplace, i.e. digital literacy/e-literacy.
- ICT skills in the work place to respond to changes in business processes and industry structures, i.e. e-skills.
- Technical skills for the specialists required for ICT and related industries.

Mbola (2008:n.d) suggests that South Africa is trying to improve the skills of the public through ICT training. The country has inaugurated an e-skills Academy of South Africa with the aim of increasing the countries' ICT systems. The academy will also improve the development of professional qualifications in the ICT industry. The former president of South Africa, Thabo Mbeki, stated that it is very important to train a large number of people, so that if any emigrate to other countries, South Africa will still be left with enough skilled workers to maintain competition (Mbola, 2008:n.d).

2.12 Challenges and opportunities for implementing ICT as service delivery instruments in South Africa

Since 1997, there has been a significant shortage of skilled personnel in SA, which remains a threat to the successful service delivery initiatives of government. This skills shortage has had a negative effect on the lives of ordinary people in the country (Mkhize, 2007:n.p.). Although South Africa's government has invested heavily in the acquisition of computers for all government departments, civil servants still struggle to use the machines effectively, as computer literacy remains a problem.

Benton (2007:n.d.) confirms that managers within government departments are not skilled in the use of technology. As a result, they cannot make use of newly introduced technological resources that the government has put in place to enhance service delivery to the public. It is very difficult for unskilled managers to assess the way in which ICT tools are used by civil servants.

Other challenges cited by the Leadership and vision for ICT in Parliament (n.d.:n.p.) include:

- high bandwidth costs;
- limited access to the Internet and technology – many people in South Africa, especially those in rural areas, do not have access to ICT facilities. High illiteracy rates also influence people's ability to use these facilities when available;
- resistance to organisational change - as organisations change the way they provide services and do their work, employees also need to adapt to these changes. However, in most cases, employees resist changes to old working methods, which makes the implementation of ICTs as working tools very difficult;
- computer literacy – many organisations have computer systems in offices, but they are not used by staff due to their inability to use them and
- lack of knowledge and information management competencies – there is very little that a person can do without knowledge (or know-how). Knowledge is power, and a staff member with little or no knowledge (of ICTs) will never perform as well as someone who knows all about ICTs.

2.13 Summary

This chapter has discussed ideas and opinions about the use and history of ICTs in general, before focusing on discussions surrounding the use of ICTs in government departments to improve service delivery, also known as e-governance. The literature review has brought to light that the social aspects of computers, telecommunications and related technologies are crucial in shaping organisational and social relations and in enhancing the ways in which social settings influence the use and design of ICTs. Organisational informatics researchers have found that ICTs can restructure workplaces based on how they are incorporated into the everyday lives of those who use them. ICT exploitation in organisational and societal contexts in Africa faces many challenges, most of them stemming from Africa's problems with ICT use and connectivity. Major challenges include lack of expertise, inadequate infrastructure, and poor funding. South Africa has already implemented several e-governance programmes; some have met with success and some less so. Nonetheless, many problems still hinder the full implementation and acceptance of these programmes, stemming from both civil servants themselves and the public in general.

The research methodology will be discussed in the next chapter (Chapter 3).

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sets out or describe the research methodology used, the target population, the sampling process and sample size, research instruments, data collection procedure, data analysis and problems experienced in the field.

3.2 Research Methodology

Sarantakos (2007:32) defines methodology as the theoretical principles and framework that underpin how research is done from within the context of a particular paradigm. In other words, methodology translates the principles of a paradigm into the language of research and shows how the world can be explained, handled, approached or studied. Greaves, Kirby and Reid (2006:97) define methodology as a step-by-step plan of what data gathering instruments the researcher will use, how the population will be selected, how data management strategies are likely to be utilised as well as ethical strategies.

Methodology depends on the research model employed by a researcher in a given project, and includes basic knowledge related to the subject, the research methods in question, and the framework employed in a particular context. Essentially, every investigation has its own distinct methodology and every researcher employs his or her own methodology, which may vary from study to study (Sarantakos, 2007:33).

According to Neuman (2006:79) research methodology is what makes social science scientific. Research methodology is concerned with a particular method of inquiry that provides answers to questions like:

What are researchers trying to do when they conduct research?

How do researchers conduct research?

Methodology is divided into two paradigms, i.e. quantitative and qualitative research, and while Neuman (2006:151) asserts that they differ in many ways, he also explains that they complement each other as well.

Qualitative research method - With this method, data is presented in the form of words and images from documents, observations and transcripts. According to Neuman (2006:151), qualitative research relies on interpretive or critical social science. Qualitative studies apply logic in practice (the logic of how research is actually carried out) and follow a non-linear research path. Qualitative researchers interpret the world through cases and contexts. Their emphasis lies on conducting detailed examinations of cases that arise in the natural flow of social life. Qualitative researchers try to present authentic interpretations that are sensitive to specific social-historical contexts. Dooley (1995:259) defines qualitative research as social research based on field observations analysed without statistics.

It is open and flexible in virtually all respects, primarily because the research process is influenced by the respondent. In qualitative research, the researcher maintains direct or close contact with the respondent and uses a dynamic approach while investigating phenomena. Qualitative research is holistic (studies the whole unit) and places priority on studying similarities (Sarantakos 2007:55).

Quantitative research method – Data in quantitative research is presented as numbers garnered from precise measurement. Most quantitative researchers rely on a positivist approach to social science. They apply reconstructed logic (the logic of how to do research that is highly organised and restated in an idealised, formal, and systematic language), and follow a non-linear research path. Quantitative researchers speak the language of variables and hypotheses. Their focus lies in precisely measuring variables and testing hypotheses that are linked to general causal explanations (Neuman, 2006:151).

According to Sarantakos (2007:55) the purpose of quantitative research is to explain social life. It is nomothetic (interested in establishing law-like statements, causes, consequences, etc) and its primary function is to test theories. Quantitative research employs an objective approach and is etiologically interested (interested in why things happen) and ahistorical (interested in explanations over space and time). It is a closed approach (i.e. strictly planned) and the research process is predetermined. In quantitative research, the researcher maintains a distance from the respondent. The approach is static and rigid and employs an inflexible process. A lot of priority is placed on studying differences (Sarantakos 2007:55).

3.3 Method and Research Design

Methods are tools for data generation and analysis. Practically, methods are the main tools of social scientists and are chosen on the basis of criteria related to or even dictated by the major elements of the methodology in which they are embedded, such as perception of reality, definition of science, perception of human beings, purpose of research, and type of research units (Sarantakos, 2007:34).

This study used both qualitative and quantitative approaches in a survey research method. Survey research samples a number of respondents who all have to answer the same questions. Through a survey, researchers can measure many variables, test multiple hypotheses, and infer temporal order from questions about past behaviour, experiences or characteristics (Neuman, 2003:276).

The study used mixed methods because the researcher wanted to get the different viewpoints of its target population. The researcher felt that the qualitative method would provide detailed data which is relevant when soliciting various views from respondents, while also using quantitative method may solicit information that may have not been covered by another method. Furthermore, adopting both approaches ensured reliability in the study. The two methods may counter check each other.

According to Neuman (2003:276) survey research enables a researcher to gather information about their target population without undertaking a complete enumeration (details). This study undertook the same approach; only a sample of the population was studied and the results from this group were used to generalize ideas about the entire population in question.

Bierkens, Brus, Gruijter and Knotters (2006:1) define survey as collecting information on an object with a spatial scope through observation, to such an extent that potential changes of the object during the observation are minor.

Ocholla (n.d.) explains that survey research is undertaken either with questions in a written questionnaire (mailed or handed out to people) or during an interview, when respondents' answers are recorded. The researcher does not manipulate the situation or condition (as in an experiment) - people simply answer questions. A survey researcher often uses a sample or a

smaller group of selected people (e.g. 150 students) and then generalizes the results onto a larger group (e.g. 5,000 students) from which the smaller group was chosen.

3.4 Population

Neuman (2006:224) defines a population as a large pool of cases or elements, such as persons, groups of people, organisations, written documents, symbolic messages, or even the social actions under investigation. He further defines a population as the abstract idea of a large group of many cases from which a researcher draws a sample and onto which results from a sample are ultimately generalised. In fact the term universe is sometimes used interchangeably with population (Neuman, 2006:224). Dooley (1995: 133) sees a population as the process whereby researchers generalise from their sample all potential elements.

The target population is a concretely specified large group of many cases from which a researcher draws a sample and onto which results from a sample are generalised (Neuman, 2006:224).

This study targeted civil servants in the uMhlatuze Municipality from the Departments of Education, Health and Social Development as well as the clients seeking service from the above mentioned departments. For the purposes of this study, only three Departments were selected, i.e. the Department of Education, the Department of Health, and the Department of Social Development, because of logistical, financial and time constraints. It was also assumed that findings of these three departments would provide enough insight to generalise about the situation in all government departments situated within the area of study.

The three departments were specifically selected because they are responsible for the delivery of a number of services that directly affect the daily lives of most of the country's population. It was consequently assumed that these departments would be at the forefront of ICT utilisation in order to streamline their service delivery to the public. However, it was also hypothesised that this may not (always) be the case from observing people often having to queue for many hours or being frustrated with officials who are ineffective and cumbersome in their dealings with their problems. The study, therefore, chose the three departments as its population (Education, Health and Social Development departments) because it was thought that they would give a very good indication of whether or not ICTs are used, and their effectiveness with regard to service delivery.

3.5 Sampling

Sampling enables the researcher to study a relatively small number of units in place of the target population, and in doing so, obtain data that is representative of the whole target population. Sampling is, therefore, the process of choosing the units of the target population that are to be included in a study (Sarantakos, 2007:139). For the purposes of this study, sampling was used to select the limited number of respondents from the entire population so that they can represent the whole population. According to Sarantakos (2007:141), sampling is generally divided into two approaches, namely probability and non-probability sampling.

3.5.1 Non-probability sampling

This method is less strict and makes no claim for representativeness. It is generally left up to the researcher or the interviewer to decide which sample units should be chosen, and is employed in exploratory, observational and/or qualitative research (Sarantakos, 2007:141). Non-probability sampling is further sub-divided into different types, i.e.; haphazard (accidental or convenience sampling), quota sampling, purposive or judgemental, snowball sampling, deviant case sampling, sequential sampling, and theoretical sampling. Dooley (1995: 135) defines non-probability sampling as any method in which the elements have unequal chances of being selected. Jackson (2006:84) further explains that non-probability sampling is likely used because it is less expensive and much easier to generate samples.

Non-probability sampling was used in this study, specifically the judgemental or purposive sampling technique, to select the departments in uMhlatuze city. Purposive sampling is an acceptable kind of sampling for special situations (Neuman, 2006:222). In judgemental sampling, the researcher gets all possible cases that fit particular criteria, using various methods (Neuman, 2006:220). Neuman (2006:222) asserts that in purposive sampling, researchers purposely select subjects who or which, in their, opinion, are thought to be relevant to the research topic. The researcher may use purposive sampling to select members of a difficult-to-reach, specialised population. Purposive sampling is appropriate for the selection of unique cases that are especially informative (Neuman, 2006:222).

Once the departments were selected, a sample was selected from all the civil servants working in the Departments of Education, Health and Social Welfare in the uMhlatuze municipality. The following sample sizes were selected:

Table 2: Sampling frame and sampling size

Departments	Total of Employees	Sample size
Education	132	33
Health	103	20
Social Development- Esikhaleni	12	12
Social-Development Ngwelezane	13	13
Social Development Richards Bay	06	06
Total	266	84

The sample sizes for each department were calculated at 3% for Education, 5% for Health, and 100% for Welfare (Esikhaleni, Ngwelezane and Richards Bay). A sample of 3% was opted for from the Department of Education because civil servants from this department (all 132 of them) are employed throughout the district, which geographically speaking, covers up to Nkandla and Eshowe. For convenience purposes, only employees from the Department of Education's head office based in the uMhlatuze Municipality (in Empangeni) were targeted, as it was assumed that their answers would be representative of the situation in all the other regional offices. A sample of 5% was selected from the Department of Health because there were (at the time of writing) 103 employees working in the Umfolozi district, which covers an area that extends beyond the boundaries of the uMhlatuze Municipality. This percentage was also chosen because some of the Department of Health's employees are not office-based, which makes them difficult to trace. Their selection would have made it difficult for the researcher to distribute and retrieve questionnaires; hence the decision was made to concentrate only on the office-based staff. Since this made the population size much smaller, the percentage was raised to at least get viable input.

All the civil servants from the Department of Social Development were selected because the social workers employed at these offices (Esikhawini, Ngwelezane and Richards Bay) were very small in number. There was no reason to sample them when all of them (100%) could participate.

Generally, it was observed that employees from these departments do not all work in offices (office-based); some work in the surrounding communities, for example a few employees

from the Department Education (circuit inspectors) go to schools for evaluation and supervision; the Department of Health has inspectors that go to clinics and hospitals to check and evaluate their work and progress; and the Department of Social Development has social workers that go out and visit old-aged people in their respective homes or care centres, or go to courts to listen to maintenance cases or assist people with other social ills that generally afflict society.

Once the sample sizes were determined, questionnaires were randomly distributed within each targeted departmental office because office staff are often busy with visits to other offices in the area. These employees come to the district office only when there are special meetings, otherwise they are out in the community working, for example in mobile clinics. The questionnaires were distributed to those staff members who were available and in their offices during the distribution of the questionnaires. For the managerial interviews, a sample of managers was also selected. To select this sample, the purposive sampling method was used, as each department has one manager responsible for the services of that department or office, and these formed the population (3) required for the interviews. The study also sampled clients that were coming to make use of the services offered by the three departments. The researcher conducted interviews with clients that were haphazardly selected from the departments' premises. Only 4 clients from the Department of Education and 4 from the Department of Social Development were selected and interviewed, as no clients visited the Department of Health.

3.6 Research Instruments

The most common types of research instruments in social or survey research are interviews, observation and questionnaires.

3.6.1 Interviews

The goal of survey research interviews is to obtain accurate information from other persons. The interview is a short-term, secondary social interaction between two strangers with the explicit purpose of one (the interviewer) obtaining specific information from the other [the interviewee] (Neuman, 2006:304). The main advantage of the interview schedule is that the

respondents get time to face the researcher, and thus more in-depth information is likely to be received.

In a survey interview, the interviewer asks questions. The respondents share their feelings and opinions to the interviewer. The interviewer is non-judgemental and does not try to change the respondent's opinions or beliefs, although he or she does try to obtain direct answers to specific questions. The interviewer avoids making ritual responses that may influence a respondent and makes every attempt to seek genuine answers. The respondent provides almost all the information. The interviewer controls the topic, direction, and pace by keeping the respondent "on task" and containing irrelevant diversions. The interviewer attempts to maintain a consistently warm, but serious and objective tone throughout. Respondents should not evade questions and are expected to provide trustful, thoughtful answers (Neuman, 2006:305). Interviews can either be conducted face-to-face, telephonically or via email (Neuman, 2006:300).

Interviews were conducted with managers and clients in each of the departmental offices.

The interview schedule asked (civil servants) were questions concerning:

- services rendered to the public;
- the public's level of satisfaction with service delivery;
- use of computers for service delivery;
- the impact of computers on service delivery;
- the challenges faced in service delivery and
- how computers can be used to improve services.

The interview schedule for clients (public) consisted of nine questions, i.e.:

- services required by the clients;
- frequency of visits to departmental offices;
- satisfaction with service delivery;
- problems faced when seeking assistance;
- opinion on the use of computers to improve service delivery;
- utilization of computers if available to obtain services;
- improvement of services and
- access to ICTs at home.

3.6.2 Questionnaires

A questionnaire is an instrument used to provide the researcher with the information they need to formulate data for a study (Sarantakos, 2007:244). The researcher weaves questions together so that they flow smoothly. The questionnaire asked both closed and open ended type of questions.

The use of questionnaires is very common in the social sciences. In most cases, questionnaires are employed as the only method of data collection. In other cases they are combined with other methods. In either case they are administered to the respondents by mail or personally by the researcher. The main characteristic of this method is that data is offered by the respondents with limited interference on the part of research personnel (Sarantakos, 2007:223).

For the purposes of this study, a questionnaire was used to collect data from the civil servants in the three selected departments. The questionnaire was opted for because questionnaires are less expensive, produce quick results, can be completed at the respondent's convenience, offer greater assurance of anonymity, and the questions themselves are stable, consistent and in uniform measure (i.e. without variation).

The researcher administered the questionnaires himself to the departments in question, i.e. Education, Health and Social Development, and on the agreed dates, they were collected again. The questionnaire consisted of six parts:

- Part one – **Personal information** (job titles, gender and level of education)
- Part two – **ICT accessibility** (of access to ICT tools like computers, internet services, etc.)
- Part three – **Types of ICT applications and services** (ICT tools available and used in the department, problems experienced when using ICT tools, use of ICT tools in the office or when servicing the public)
- Part four – **The level and range of use/interaction with ICTs** (level of ICT use by staff, time spent using ICT tools, how ICTs are used by staff, etc.)
- Part five – **Impact of ICTs tools and services** (which ICT tools are considered effective for office use)
- Part six – **Training needs** (where ICT training is required)

3.7 Procedure of Data Collection

Prior to the field study, the departments were visited by the researcher to seek permission to conduct research. In each case, a letter written by the Library and Information Science Department was presented, outlining the study and introducing the researcher. Unfortunately, the managers of the three departments had no right to authorise the study. The researcher was advised to write to the cluster managers in Ulundi, who, as it turned out, also had no right to grant permission. Eventually the researcher was advised to write to the Head of the Department in Pietermaritzburg for permission, after which the field study could proceed. This process was completed over a two month period.

The departments responded positively - Table 2 shows the distribution and response rate. The questionnaires were returned via the receptionist in each department. The respondents were asked to place the completed questionnaires in a box that was placed by the researcher in the reception area, from where they were collected on the agreed dates.

Table 3: Questionnaire Responses (Procedure of Data Collection)

Departments	Handed Out	Received Back	Percentage
Education	33	21	64
Health	20	09	45
Social Development - (Esikhawini)	12	05	42
Social Development (Ngwelezane)	13	07	62
Social Development (Richards Bay)	6	6	100
Total	84	48	58

The reason for the low response rate was that during the time of distribution it was late November when a number of civil servants were on leave. Some of them did not return the questionnaires to the agreed upon collection point. To extract the largest number of responses possible the researcher gave the respondents until January/February to return the questionnaires, but still there were not a huge return rate, and some have mislaid the questionnaire. Due to time constraints the researcher was forced to continue with the responses he got. It was also reasoned that a 58% return rate was big enough to make general assumptions about the situation in the Departments under study.

3.8 Data Analysis and Presentation

Once data is collected, it is essential that it is organised in such a way that conclusions may be drawn. According to Sarantakos (2007:313) the process of data processing and of converting raw data into meaningful statements is otherwise known as the analysis and interpretation of data. According to Neuman (2003:156), data analysis is a technique used to gather and analyse the content of text. Content refers to words, meanings and pictures, symbols, ideas, themes or messages that can be communicated. In this study, the data was analysed manually, and tables and descriptions were used to present the results.

3.9 Constraints

The whole research exercise was eventually successful. However, the researcher encountered a few problems before, during, and after the field study.

3.9.1 Before going on to the field

The nature of this study necessitated funding from external sources, in this particular case, the university. The process of getting funds was complicated, with a lot of procedures that had to be followed before funds could be secured. It took more than two months to obtain the funds that enabled the researcher to distribute the questionnaires. The Faculty Research Committee first had to review the research proposal before it could be approved. The project then had to be registered with the research committee, and only after this was done could the researcher apply for research funds, which had to go via a committee for approval as well. All of this proved time-consuming.

As already mentioned, the researcher also had to ask for permission to conduct research at the targeted departments (Education, Health and Social Development), a process that took more than 2 months to complete.

3.9.2 Conducting the field study

The researcher encountered a few problems while conducting the field study. For one, some staff members did not honour their appointments when the researcher set out to receive questionnaires or provide clarity on some sections of the questionnaires that were deemed unclear by the staff. The researcher often arrived early, only to find that there was a meeting

at the same time as the scheduled appointments, or that staff members were not present at work and had not informed [the researcher] of their absence. Another problem was that on occasion, the researcher missed appointments or arrived late at the various departments because of the lateness of staff visited prior to other scheduled appointments. Further problems encountered in each department are discussed below.

3.9.2.1 The Department of Education

By the time the researcher was granted permission, it was already November, thus many employees were at marking centres where they were in charge of supervising the marking process of the 2007 Grade 12 papers. The researcher decided to return in February to distribute the questionnaires. This worked well as by then, all the staff members were back from their holidays, and the questionnaires were completed and returned as agreed.

3.9.2.2 The Department of Health

In November 2007, 20 questionnaires were given to the Manager of Human Resources who promised to distribute them to the department's employees. However, because the majority of staff members were on leave at the time, the Human Resources Manager misplaced the questionnaires and then requested the researcher to rather return in February to administer them again. This was done, and the completed questionnaires were submitted on the agreed date.

3.9.2.3 The Department of Social Development

The employees targeted in this department were mainly social workers, seeing as administration clerks and administrators are no longer working for the Department of Social Development (they now belong to the SASSA - South African Social Security Agency). The social workers were found to be very busy people. In most cases they were not available in their offices because of their busy schedules. Thus, often when the time came to collect the questionnaires, it was found the social workers did not have sufficient time to address them. The researcher kept checking for the outstanding questionnaires until he was satisfied of the responses.

It was also difficult to trace clients who used the department for interviews, as most of the clients who were on the premises at the time were old people who could not understand

English. The researcher was forced to translate the questions into isiZulu so that they could understand. At a later stage, the answers were translated back into English. Four clients were eventually interviewed.

3.9.3 After conducting the field study

A lot of time was wasted due to the problems encountered before the field work could commence. The study work plan was totally disrupted, resulting in late nights and a working holiday. There was also a problem encountered during the analysis of the collected data. Since the researcher had planned to use the Statistical Package for Social Sciences (SPSS), of which he is not an expert, an analyst was arranged. He was, however, not available during the time scheduled for the analysis, forcing the researcher to wait until he had returned. This also took up too much time, eventually resulting in the (researcher's own) manual analysis of the data. Manual analysis is when a researcher uses no scientific method but count with his or her own hands.

3.10 Summary

This chapter has discussed the methods used to gather data for the study. The population of this study consisted of three departments (Education, Health and Social Development) from the uMhlatuze Municipality. The study used purposive sampling for the general respondents. The study also used the interview schedule to interview managers and a few clients who were on the premises of the various departments, using haphazard sampling to select the respondents.

The next chapter presents the data analysis. (Chapter 4)

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

Chapter four presents the data and analyses the data according to the objectives and items in both the questionnaire and the interview schedules. The questionnaires gathered data pertaining to personal information, ICT accessibility, types of ICT applications and services, the level and range of use or interaction with ICTs, the impact of ICT tools and services, and the training needs of the civil servants. The sampled staff members from the Departments of Education, Health and Social Development were given the same questionnaire to complete and the results were analysed separately for each department to draw a comparison in the ways they each use ICT tools and services to render services to the public.

As noted earlier, the researcher also interviewed various employees and clients from the three departments. One manager from each office was interviewed, and four clients from each of the Departments of Education and Social Development were approached. Clients from the Department of Health were not interviewed because they primarily consist of traditional healers, Non-Governmental Organisations (NGOs) and municipalities who generally do not visit the department's premises for service delivery.

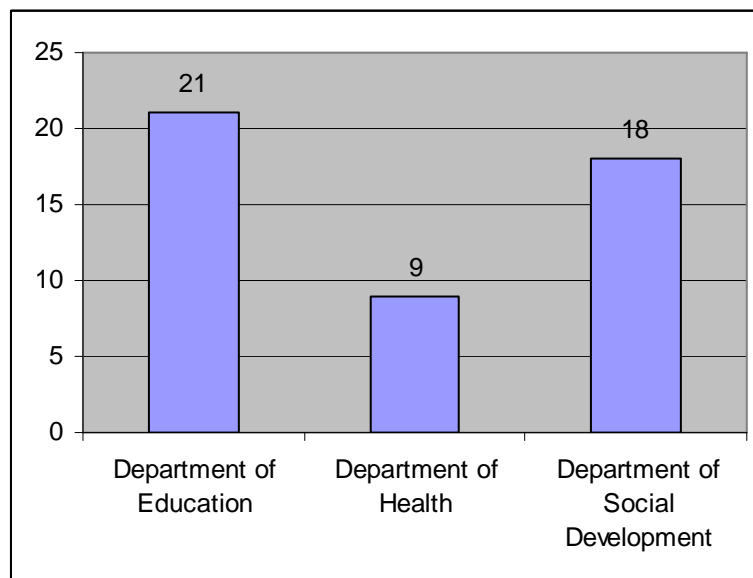
The responses were analysed manually. The analysis of the questionnaires is presented first, followed by the interview results.

4.2 Profile of respondents

4.2.1 Departmental representation (N=48)

The Department of Education produced the highest number of responses (21; 44%) followed by the Department of Social Development (18; 38%) and lastly the Department of Health (9; 19%), as shown in Figure 1 below.

Fig 2: Department representation



4.2.2 Personal Information

4.2.2.1 Current Job Titles

This question sought to ensure that a wide spectrum of staff members were included in the analysis. It was noted that in all three departments, the respondents were from all sectors, i.e. administration (clerks), office (subject advisors, social workers, health promoters) and management (deputy chief director, environmental health practitioner, development practitioner).

The results presented in Table five suggest that most of the respondents were administration clerks - a job that was common across all the three departments - followed by deputy directors (the public servants mandated to deal with the general public on a daily basis).

Table 5: Job title (N=48)

Education (N=21)			Health (N=9)			Social Development (N=18)		
Staff Job Title			Staff Job Title			Staff Job Title		
Description	Number	%	Description	Number	%	Description	Number	%
Office based Educator	2	10	Environmental Health Practitioner	1	11	Clerk	2	11
Deputy Chief Education Specialist	1	5	Health Promoter	1	11	Development practitioner	3	17
Educator	2	10	Administration Clerk	1	11	Social worker	8	44
Subject Advisor	3	14	Nurse	4	45	Administration support head	1	6
None	3	14	Secretary	1	11	Supervisor -Social worker	1	6
Curriculum Specialist	1	5	No response	1	11	Typist	1	6
Assistant director	1	5				Office manager	2	11
Personnel officer	1	5				Administration clerk	1	6
FES-Office based educator	1	5						
Senior education specialist	1	5						
Co-coordinator	1	5						
Senior administration clerk	1	5						
Administration clerk	1	5						
Secretary	1	5						
Deputy chief director	1	5						

4.2.2.2 Qualification levels of the Civil Servants

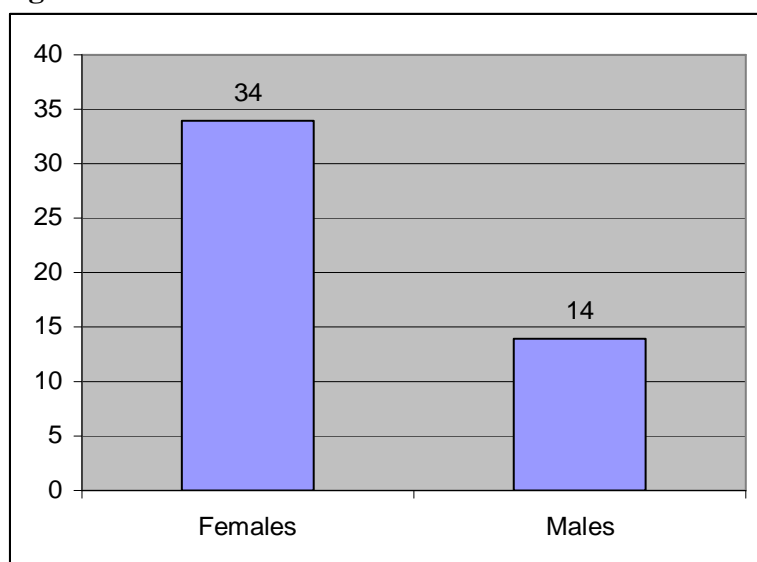
Table 6 indicates that most of the respondents had attained a Bachelors Degree. A number of respondents from the Department of Education had attained further qualifications, such as Masters degrees (4) and other post-graduate qualifications (10). Most of the staff members, therefore, generally appear well educated. The Department of Social Development possessed 10 respondents with Bachelors Degrees, 3 with post-graduate qualifications, and one with a Masters Degree. Most respondents from the Department of Health had Diplomas (4), with 1 Masters and 1 Bachelors Degree, and 2 post-graduate Diplomas.

Table 6: Level of Qualification (N=48)

Education (N=21)			Health (N=9)			Social Development (N=18)		
Qualification	Response	%	Qualification	Responses	%	Qualification	Responses	%
Bachelors Degree	3	14	Diploma	4	45	Diploma	2	11
Post-graduate Diploma	9	43	Certificate	2	22	Certificate	3	17
Masters Degree	4	19	Post-graduate Diploma	1	11	Masters Degree	1	6
Certificate	4	19	Masters Degree	1	11	Bachelors Degree	10	55
Honors Degree	1	5	Bachelors Degree	1	11	Post-graduate Diploma	2	11

4.2.3 Gender distribution

Figure 2 shows that there were more female (34; 71%) respondents than male (14, 29%) in the surveyed departments. The nature of the work done in and by the departments – stereotypically is in favor of females - is possibly behind this. This is particularly the case in the Departments of Social Development and Health, where most of the social workers were female.

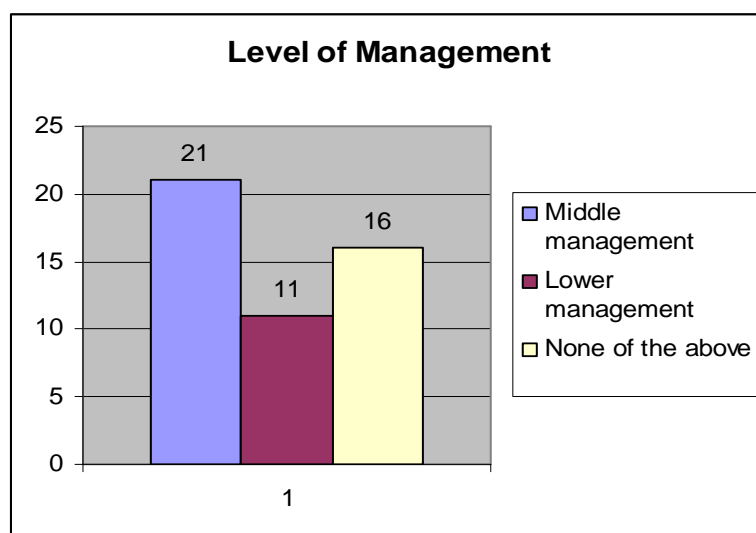
Fig 3: Gender distribution

4.2.3.1 The management level of the respondents

There were no responses from the top management cadre, even though questionnaires were also distributed to this group. Managers are busy people and, therefore, do not always have the time to complete surveys. Most of the responses received were from middle management,

i.e. deputy directors and middle managers. The second largest group of respondents consisted of ordinary staff members who were not involved in any managerial or senior positions. Lower management includes supervisors and deputy managers. The results are summarised in Figure 3.

Fig 4: Level of management



4.2.3.2 Access to ICT tools

The civil servants were required to indicate whether they had access to ICTs. The results in Table 4 illustrate that tools like computers (18; 100%), fax machines (18; 100%), copy machines (18; 100%), printers (18; 100%), overhead projectors, Intranets (11; 52%), mobile phones (14; 67%), diskettes and telephones (18; 100%) get used frequently, particularly in the Department of Education and the Department of Health. Video cameras (4; 44%), video recorders (4; 44%), the Internet (3; 33%), scanners, radio, data projectors, and databases recorded seldom use in the departments. The Department of Social Development recorded the lowest amount of access, particularly to mobile phones, television, radio, video cameras, video recorders, sound/tape recorders, overhead projectors, the Internet, and data projectors. The Internet is a modern way of providing access to information, but Table 7 suggests that there does not really seem to be abundant access to it in any of the departments.

Table 7: Access to ICT tools (N=48)**A=Accessible****NA=Not Accessible**

ICT tools and Services	Education (N=21)				Health (N=9)				Social Development (N=18)			
	A	%	NA	%	A	%	NA	%	A	%	NA	%
Computer, i.e. PC	18	86	3	14	8	89	0	0	18	100	1	6
Laptop Computer	8	38	11	52	2	22	5	56	4	22	9	50
Internet	3	14	18	86	3	33	4	44	2	12	10	56
Intranets	11	52	9	43	7	78	1	11	4	22	9	50
Databases (online)	2	10	15	71	3	33	5	56	3	17	9	50
Telephone	19	90	2	10	7	78	0	0	18	100	0	0
Mobile phones	14	67	5	24	3	33	3	33	2	12	12	67
Television	5	24	13	61	3	33	4	44	0	0	12	67
Radio	3	14	15	71	1	11	5	56	0	0	12	67
Video Cameras	3	14	16	76	3	33	4	44	0	0	12	67
Video Recorders	1	5	18	86	1	11	4	44	0	0	12	67
Sound/tape recorders	3	14	14	67	1	11	5	56	0	0	12	67
Overhead projector	15	71	4	19	4	44	4	44	0	0	12	67
Fax machines	19	90	2	10	8	89	0	0	18	100	0	0
Digital camera	2	10	14	67	4	44	3	33	0	0	12	67
Printer	17	81	3	14	8	89	0	0	18	100	1	6
Scanners	5	24	13	61	3	33	4	44	3	17	7	39
Data projector	4	19	14	67	7	78	1	11	0	0	11	61
Diskette	16	76	3	14	8	89	0	0	6	33	8	44
Copy machines	19	90	2	10	8	89	0	0	18	100	0	0

4.2.4 Civil servants' level of access to a computer for work purposes or service delivery

Civil servants were asked whether they have access to a computer system where they work or in their offices where they assist the public. The results in Table 8 below indicate that computers are now generally available in Public Servants' Office. A number of respondents indicated that they could access computers in their offices and even at home.

Table 8: Access to a Computer (N=48)

Descriptions	Education (N=21)		Health (N=9)		Social Development (N=18)	
	Number	%	Number	%	Number	%
Share in Office	2	10	1	11	5	28
At home	4	19	1	11	0	0
In Office	5	24	4	44	6	33
Laptop	6	29	1	11	1	6
Both at home and Office	5	24	3	33	4	22
No response	2	10			2	11

4.2.5 Access to Internet Services

The results in Table 9 below indicate that in most cases, the Internet is not available for use by the departments to deliver services to the public or to do their daily work. Across all the departments, there was generally no access to the Internet. Where it exists, Internet access is shared, which is a problem because one cannot effectively surf the Internet and produce good results when one is expected to share with others. Internet can be used to download important documents or forms that people need on daily basis in government departments. E-mails can be sent to enquire some applications that were made to head offices.

Table 9: Access to Internet Services (N=48)

Education (N=21)			Health (N=9)			Social Development (N=18)		
Description	Number	%	Description	Number	%	Description	Number	%
No access	10	48	No access	3	33	No access	13	72
Share in Office	1	5	Via Laptop and Mobile phone	2	22	At home	2	11
Via Laptop	5	24	In Office	2	22	At PC where I assist public	1	6
Both at home and office	1	5	Share in Office	2	22	Share in Office	3	17
In Office	2	10						
At home	5	24						

4.2.6 Availability of ICT applications for office use or public service

In order to be able to deliver services quickly and efficiently, civil servants need to have ICTs physically available. With this question, the researcher wished to determine whether or not civil servants have access to ICT tools that would enable them to improve service delivery.

Table 10 below indicates that availability is a problem with regard to certain ICT tools in government departments. The only ICT tools that are generally available, even then mostly for office use, are tools such as telephones, computers, copy machines, printers, fax machines and (on occasion) Intranets. Tools that are somehow unavailable include: laptop, television, radio, digital camera, databases (online) and video cameras. The results clearly show that ICT tools are more readily available for office use than for public service delivery. The Department of Education reportedly has computers (14; 66% each), Intranets (13; 62% each), telephones (12; 57% each), printers (14; 66% each) and copy machines (12; 57% each). The Department of Health has computers (8; 89% each), Intranets (7; 78% each), telephones (8; 89% each), mobile phones (5; 56% each) and fax machines (7; 78% each), and printers, data projectors, diskettes and copy machines (8; 89% each). The Department of Social Development has a large number of computers and telephones (17; 94% each), and also fax machines (15; 83% each), printers (12; 67% each) and copy machines (14; 78% each).

Table 10: Availability of ICT applications (N=48) OU=Office Use PS=Public Service

ICT tools and Applications	Education (N=21)				Health (N=9)				Social Development (N=18)			
	OU	%	PS	%	OU	%	PS	%	OU	%	PS	%
PC	14	66	3	14	8	89	1	11	17	94	4	22
Laptop Computer	6	29	3	14	2	22	3	33	5	28	0	0
Internet	2	10	0	0	3	33	1	11	3	17	0	0
Intranets	13	62	0	0	7	78	1	11	5	28	2	11
Databases (Online)	0	0	1	5	4	44	1	11	3	17	0	0
Telephone	12	57	3	14	8	89	3	33	17	94	5	28
Mobile Phones	7	33	2	10	5	56	3	33	0	0	1	6
Television	2	10	0	0	2	22	2	22	0	0	1	6
Radio	2	10	0	0	0	0	1	11	0	0	1	6
Video Cameras	1	5	3	14	3	33	4	44	0	0	1	6
Video Recorders	0	0	3	14	1	11	3	33	0	0	1	6
Sound/Tape recorders	3	14	1	5	1	11	2	22	0	0	1	6
Overhead projector	8	38	4	19	3	33	3	33	0	0	1	6
Fax machines	10	48	2	10	7	78	2	22	15	83	4	22
Digital camera	0	0	1	5	3	33	4	44	0	0	1	6
Printer	14	66	1	5	8	89	2	22	12	67	4	22
Scanners	6	29	0	0	4	44	3	33	3	17	1	6
Data projector	4	19	0	0	8	89	2	22	0	0	1	6
Diskette	8	38	1	5	8	89	1	11	3	17	1	6
Copy machines	12	57	3	14	8	89	2	22	14	78	5	28

4.2.7 Problems encountered when using ICT tools

The use of ICTs can pose many problems to its users. These problems can quite often inhibit users of ICTs from working efficiently, or they can lead users to rather opt for paper-based or manual analyses. This question, therefore, sought to identify the problems that civil servants face when using ICT tools for work purposes or during the service delivery process.

Table 11 shows that ICT skills' shortages are problematic especially among civil servants in the Department of Health, while lesser so among the other two departments. According to the respondents, a number of services cannot be used due to the lack of proper training, creating problems for those wishing to connect PCs to networks, send e-mails, use PowerPoint, operate data projectors, use the spreadsheet, work with databases, surf/use the Internet, or simply set up computers. The printer is the only tool that all the respondents had no problem using, as the results illustrate. Employees from the Department of Health did not have problems with file management facilities, the Windows Operating System, and keyboard functions; major problems reported by the department's employees were in using computers for accounting in spreadsheets (56% each), maintaining PCs (56% each), operating video cameras (67% each) and operating scanners (56% each). A small number of respondents from the Department of Education reported very few problems in using certain ICT tools, for instance connecting to networks in PCs and troubleshooting (38% each), and setting up PCs, operating video cameras, and operating scanners (33% each). Very few respondents from the Department of Social Development indicated problems, but those that did cited troubleshooting (44% each); operating data projectors using PowerPoint, sending e-mails and setting up PCs (39% each); and operating video cameras, using the Internet, and connecting networks to PCs (33% each).

Table 11: Problems experienced when using ICT tools and Services (N=48)

Problems	Education (N=21)	%	Health (N=9)	%	Social Development (N=18)	%
Cannot use file management facility on PC	5	24	0	0	3	17
Cannot use Windows Operating System effectively	2	10	0	0	1	6
Do not have effective keyboarding skills	3	14	0	0	3	17
Cannot use word processing facility in the PC	2	10	2	22	0	0
Cannot use PC for accounting in a spreadsheet	6	29	5	56	5	28
Cannot use Databases	6	29	3	33	5	28
Cannot use presentations programmes i.e. PowerPoint	2	10	1	11	7	39
Cannot send an e-mail	1	5	1	11	7	39
Do not know how to use Internet	2	10	1	11	6	33
Do not know how to connect Network into PC	8	38	4	44	6	33
Cannot set up PC	7	33	2	22	7	39
Cannot maintain PC	4	19	5	56	4	22
Cannot solve troubleshooting problems	8	38	4	44	8	44
No ICT support team in the Department	4	19	4	44	1	6
Cannot operate tools such as the video camera	7	33	6	67	6	33
Cannot operate tools such as the data projector	2	10	3	33	7	39
Cannot operate tools such as the scanner	7	33	5	56	5	28
Cannot operate tools such as the printer	0	0	0	0	0	0

4.2.8 ICTs utilised for work or service delivery purposes

ICT tools can be used for various purposes depending on the work environment and what output is expected from their users. This question sought to establish what ICTs are used by the civil servants for specific work-related purposes. The respondents indicated (see Table 12) that all of the mentioned ICT tools are used in the departments, albeit mostly for the same work. Respondents from the Department of Education noted that tools such as the telephone, fax, PCs and e-mail are frequently used. The PC is the most used tool in the Department of Education. Responses indicate that employees from the Department of Social Development used ICT tools less than the other departments; for example, the Internet is only used for research purposes and PowerPoint for presentations. PowerPoint can also be used for graphic design. Other departments also made use of projectors and PCs. The Department of Health is the only department that organised educational talks when generally assisting the public, which is very impressive because talking to people is always better than communicating with them via computers and telephones. Intranets were only used by the Department of Education for both educational and research purposes.

Table 12: ICT tools used for work (N=48)

Work Done	Education	Health	Social Development
To collaborate with Civil Servants	Internet, Telephone, e-mail, Cell phone	Telephone, Cell phone, Fax, e-mail, PC	Fax, Telephone, Cell phone
To communicate with colleagues world-wide	Internet, Fax, Cell phone, e-mail, Telephone	Telephone, Cell phone, Fax, e-mail, PC	Internet, Telephone, Fax, e-mail
To disseminate departmental information	Fax, Internet, e-mail,	Telephone, Cell phone, Fax, e-mail, PC, Pamphlets	Fax, Telephone, e-mail
For research purposes	Intranets, Internet, PC, Telephone	Telephone, Cell phone, Fax, e-mail	Internet
For educational purposes	Fax, PC, Intranets, Internet, Telephone	Overhead projector, Video recorders, Telephone, Cell phone, Fax, e-mail	Radio, TV, Video recorders
For word processing	PC	PC	Word processing, PC
For Internet access	Cell, PC, Internet	PC	Internet, laptop, PC
To create/access a spreadsheet	PC	PC	Excel, PC
For records management	Telephone, PC, electronic filing	PC	Electronic filing, PC
For presentations	PC, Data projector, Overhead projector, PowerPoint	Laptop, PC, Data projector	PowerPoint
For database searching	Cell phone, PC	PC	Internet, Online databases
For information retrieval	Disks, PC	Internet, PC	Disks, PC, Internet
For printing	Printer	Photo copier, printer,	Photo copier, Printer
To assist the general public	Telephone, PC, Fax	Educational talk, Telephone	TV, Radio

4.2.9 Frequency of use or interaction with ICT applications

This question aimed to determine the level of use of ICT tools by civil servants in the service delivery process. The results in Table 13 indicate that computers, telephones, fax machines, printers, and copy machines are generally used frequently by civil servants, while sound/tape recorders and Intranets are seldom used. In the Department of Education, respondents indicated that they frequently made use of computers, fax machines and printers (17; 81% each), telephones (18; 86% each), copy machines (15; 71% each), mobile phones (14; 67% each), and diskettes (11; 52% each). There are some tools that had never been used by most of the respondents in the Department of Education, such as decision support systems (14; 67% each), and databases, video cameras and management information systems (12; 57% each). The Department of Health's respondents frequently used tools like overhead projectors, digital cameras and copy machines (7; 78% each), and computers and Intranets (6; 67% each). Video cameras and video recorders (6; 67% each) were virtually never used in this department. Respondents from the Department of Social Development frequently used the printer (18; 100% each), fax machines and computers (17; 94% each), copy machines (15; 83% each), and telephones (14; 78% each). Tools that are virtually never used by employees from the Department of Social Development include the Internet, radio, video recorders, overhead projector, data projectors, and management information systems (6; 33% each).

Table 13: Level of use of ICT Applications (N=48) O=Often S=Seldom N=Never

ICT tools and Services	Education (N=21)						Health (N=9)						Social Development (N=18)					
	O	%	S	%	N	%	O	%	S	%	N	%	O	%	S	%	N	%
PC	17	81	2	10	2	10	6	67	2	22	0	0	17	94	1	6	0	0
Laptop Computer	6	29	5	24	10	48	1	11	2	22	4	44	1	6	3	17	5	28
Internet	3	14	8	38	10	48	2	22	1	11	4	44	2	11	3	17	6	33
Intranets	5	24	9	43	7	33	6	67	1	11	1	11	1	6	2	11	5	28
Databases (Online)	0	0	4	19	12	57	1	11	2	22	4	44	1	6	0	0	5	28
Telephone	18	86	2	10	0	0	7	78	1	11	0	0	14	78	1	6	1	6
Mobile phones	14	67	0	0	3	14	4	44	0	0	3	33	6	33	1	6	5	28
Television	6	29	4	19	10	48	2	22	2	22	4	44	6	33	0	0	3	17
Radio	5	24	4	19	11	52	2	22	1	11	4	44	6	33	0	0	3	17
Video cameras	1	5	6	29	12	57	1	11	1	11	6	67	0	0	2	11	6	33
Video recorders	0	0	6	29	11	52	1	11	1	11	6	67	1	6	2	11	6	33
Sound/tape recorders	0	0	11	52	7	33	1	11	3	33	4	44	1	6	3	17	4	22
Overhead projector	7	33	8	38	5	24	7	78	1	11	0	0	0	0	1	6	6	33
Fax machines	17	81	3	14	0	0	1	11	1	11	4	44	17	94	1	6	0	0
Digital camera	2	10	7	33	11	52	7	78	1	11	0	0	1	6	3	17	4	22
Printer	17	81	1	5	1	5	2	22	1	11	3	33	18	100	0	0	0	0
Scanners	1	5	10	48	9	43	1	11	4	44	2	22	1	6	2	11	5	28
Data projector	0	0	9	43	8	38	2	22	3	33	2	22	0	0	1	6	6	33
Diskette	11	52	5	24	2	10	1	11	0	0	3	33	2	11	3	17	5	28
Management Information Systems	1	5	4	19	12	57	1	11	1	11	3	33	1	6	0	0	6	33
Information systems	3	14	4	19	11	52	1	11	1	11	4	44	1	6	0	0	5	28
Decision support systems	1	5	2	10	14	67	1	11	1	11	0	0	0	0	1	6	5	28
Copy machines	15	71	5	24	1	5	7	78	0	0	0	0	15	83	1	6	1	6

4.2.10 Time spent per day when using ICTs for office or public service

This question sought to gain an insight into the amount of time that civil servants spend per day using the different ICT tools that are available to them to service the public and do other office-related work. Table 14 Indicates that a number of ICT tools are not used at all, for example video cameras, video recorders, sound or tape recorders, scanners databases, laptops, and the Internet. Respondents from both the Department of Education (8) and the Department of Health (7) indicated that they used computers at least 6-10 hours a day for their work. Fax machines are used more often by all the departments, but only for less than an hour a day. Possibly, this is because the fax machine is used a lot to communicate with the Head Offices whenever something is needed or when correspondence is to be received from other Offices or the Head Office. The telephone is also used frequently - between 1-5 hours - although more respondents from the Department of Health used it (for 6-10 hours per day).

In most cases, respondents use the telephone to communicate with anyone that might need assistance. Other respondents indicated that they used mobile phone for more than 16 hours for both public (where the public can phone and enquire about certain services) and office use (where civil servants uses phone to communicate with each other within the department or to communicate with head office). Employees may opt for this when the telephone lines in their offices do not function, and in any case, private calls are not allowed in most offices. All the departments' employees indicated that they mostly used ICTs for office-related work as opposed to public service. The respondents also indicated that they generally did not spend more than 10 hours per day using ICTs.

Five civil servants from the Department of Education used mobile phones for office use between 11-15 hours per day. Civil servants from the Department of Social Development seem to use less ICT tools for both office and public work. They mentioned that they use computers (13) between 1-5 hours per day; they also indicated that they use fax machines (10) and printers (7) for less than an hour. Telephones (7) were used by the respondents between 1-5 hours per day (for office use, not public service), while copy machines (9) were used for less than an hour per day and for office use only. Respondents from the Department of Health used few ICT tools for less than an hour everyday; the latter include fax machines (5), printers (4) and copy machines (5). All these tools are used for office work only. Respondents from the Department of Education used a number of ICT tools for less than an hour per day, including Intranets (7), overhead projectors (7), fax machines (8), copy machines (8), printers

and data projectors (5). PCs (8) and telephones are used by respondents from that department between 6-10 hours per day. Generally, the results in Table 14 indicate that there is a significant problem in the way that ICT tools are used by civil servants because it demonstrates that there is no interaction between them and the public communicating or performing their functions using ICT tools. Very few respondents indicated they used ICT tools to interact with the public.

Table 14: Time spent per day using ICTs for office or public service (N=48)

O=Office P=Public

ICT	Education (N=21)												Health (N=9)												Social Development (N=18)																	
	Less than 1 hour		1-5 hours		6-10 hours		11-15 hours		More than 16 hours		None		Less than 1 hour		1-5 hours		6-10 hours		11-15 hours		More than 16 hours		None		Less than 1 hour		1-5 hours		6-10 hours		11-15 hours		More than 16 hours		None							
	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P						
PC	1	2	6	0	8	4	2	0	1	0	2	1	2	1	0	0	7	1	0	0	0	0	0	0	2	0	13	3	3	0	0	0	0	0	0	0						
Laptop	2	0	3	1	4	1	0	0	0	0	8	2	2	0	0	1	0	1	0	0	0	0	0	5	1	0	0	2	0	0	0	0	0	0	0	1	0					
Internet	5	2	1	2	1	0	0	0	0	0	8	1	1	0	0	0	2	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	3	0						
Intranets	7	1	3	2	0	0	0	0	0	0	8	2	1	0	1	0	6	0	0	0	0	0	3	0	2	0	0	0	1	0	0	0	0	0	1	0						
Database	2	0	0	1	0	0	0	0	0	0	10	4	1	0	1	0	0	1	0	0	0	0	4	0	1	1	1	0	1	0	0	0	0	0	2	0						
Telephone	4	0	6	3	5	2	3	3	1	0	1	1	1	0	2	0	5	1	0	0	0	0	0	0	6	2	7	0	2	0	0	0	0	0	0	0						
Mobile Phone	3	1	3	1	2	0	5	3	1	1	3	1	0	0	1	1	0	0	0	1	0	0	3	0	0	0	2	0	1	0	0	0	0	0	0	0						
Television	1	1	2	3	2	0	0	0	1	0	8	3	0	0	1	0	0	2	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	3	0						
Radio	0	1	3	2	1	0	0	0	1	0	7	2	0	0	0	1	0	1	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	2	0						
Video Camera	3	0	0	2	0	1	0	0	0	0	13	4	1	0	0	0	1	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	3	0						
Video Recorder	1	0	0	2	1	1	0	0	0	0	11	4	1	0	0	0	1	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	2	0						
Sound/ Tape Recorder	3	1	0	3	1	0	0	0	0	0	11	4	1	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	3	0						
Overhead Projector	7	1	7	1	0	0	1	0	1	0	5	1	1	0	0	0	1	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	3	0							
Fax	8	0	5	2	0	0	1	3	2	0	4	1	1	0	5	0	1	2	0	0	0	0	2	0	10	2	4	0	1	0	0	0	0	0	1	0						
Digital Camera	1	0	1	2	1	1	0	0	0	0	8	4	1	0	1	1	1	1	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	2	0							
Printer	5	1	6	1	0	0	1	1	1	0	4	1	1	0	4	0	2	2	0	0	0	0	1	0	7	0	6	1	1	0	0	0	0	0	0							
Scanner	4	1	1	0	2	0	0	0	0	0	10	5	1	0	2	0	1	1	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	2	0							
Data Projector	5	1	4	0	0	0	0	0	0	0	7	2	4	0	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0							
Diskette	5	0	2	1	3	0	0	0	0	0	3	1	1	0	2	0	1	0	0	0	0	0	3	0	1	0	0	0	1	0	0	0	0	2	0							
Copy Machine	8	0	4	0	2	2	2	0	1	0	2	1	1	0	5	0	1	2	0	0	0	0	0	0	9	0	5	1	2	0	0	0	0	1	0							

4.2.11 Period of availability or use of ICT tools

This question sought to determine the amount of time civil servants already used ICT tools for work purposes and/or service delivery. The results (provided in Table 15 on the next page) show that quite a number of ICT tools have (thus far) never been used to provide services by the Department of Education, for instance: databases (15), video cameras and decision support systems (14), video recorders and management information systems (13), information systems and sound/tape recorders (12), laptops and scanners (11), the Internet (10), and data projectors (9). On the other hand, there are those ICT tools that have been available in the department for over 10 years, e.g. the telephone (16), radio (12), television (11), copy machines (10), fax (9), computers and printers (8). Most of the Department of Health's respondents indicated that they had not used a number of ICT tools, including the Internet, scanners, management information systems, information systems, and decision support systems (4). Tools that have reportedly been as used for between 2-5 years are computers, Intranets and telephones (4). Most respondents from the Department of Social Development stated that they have been using telephones (9), television and fax (8), radio (7), printers and copy machines (6) for over 10 years. Mobile phones (6) have been used by most of the respondents for 5-10 years, while computers (7) have been used 2-7 years.

Table 15: Length of time ICTs have been utilised by each department (N=48)

ICT tools and Services	Education (N=21)						Health (N=9)						Social Development (N=18)					
	Less than a year	1-2 years	2-5 years	5-10 years	Over 10 years	Not used	Less than a year	1-2 years	2-5 years	5-10 years	Over 10 years	Not used	Less than a year	1-2 years	2-5 years	5-10 years	Over 10 years	Not used
PC	1	1	4	5	8	2	2	1	4	0	1	0	1	6	7	4	1	0
Laptop	2	2	4	3	0	11	1	0	3	0	0	3	1	1	3	0	0	3
Internet	1	3	6	0	0	10	0	0	2	1	0	4	1	3	3	0	0	2
Intranets	2	3	5	3	0	7	1	1	4	1	0	1	2	2	0	0	1	3
Databases	1	0	0	1	0	15	0	0	3	0	0	3	0	0	0	0	2	4
Telephone	0	0	0	3	16	1	0	1	4	1	2	0	0	2	2	3	9	0
Mobile phone	0	0	1	6	6	7	0	0	1	2	0	2	0	0	1	6	2	2
Television	0	0	0	1	11	8	0	0	2	1	1	2	0	1	0	0	8	2
Radio	0	1	0	2	12	8	0	0	0	1	1	3	0	0	0	0	7	2
Video camera	0	1	2	2	2	14	1	1	2	0	0	3	0	0	0	3	1	3
Video rec.	0	3	0	3	2	13	1	2	0	0	0	3	0	0	0	2	3	2
Sound/tape Recorder	1	0	2	3	5	12	1	1	0	1	0	3	0	0	0	0	4	3
Overhead Projector	0	1	2	6	7	5	1	0	2	1	0	3	0	0	0	0	3	3
Fax	1	2	3	3	9	3	1	3	1	1	2	0	4	0	1	1	8	1
Digital Camera	1	3	3	1	4	9	1	0	2	1	0	3	1	0	3	0	2	2
Printer	1	2	2	0	8	6	1	2	2	1	1	0	2	0	2	4	6	0
Scanners	1	3	4	1	0	11	1	0	1	1	0	4	2	0	0	0	0	1
Data projector	2	2	4	2	2	9	3	1	2	0	0	2	1	0	0	1	0	3
Diskette	0	1	5	1	6	6	1	1	0	0	1	2	0	1	0	0	2	2
Management information systems	1	2	0	1	1	13	1	0	0	0	0	4	0	0	0	0	1	3
Information systems	0	1	2	2	0	12	1	0	1	0	0	4	0	0	0	0	1	3
Decision support systems	0	0	1	2	1	14	1	0	1	0	0	4	0	0	0	0	1	3
Copy Machine	1	1	3	2	10	4	2	2	1	0	1	1	1	1	1	5	6	0

4.2.12 Effectiveness of ICT applications or services for work

The results in Table 16 reflect that commonly found ICT tools in offices are the ones that the civil servants believed to be very effective in assisting them in their daily work. These include computers, copy machines, fax machines, mobile phones, and telephones. Computers (18; 86%), the telephone (17; 81%), printers (17; 81%), fax machines (15; 71%), copy machines (15; 71%) and mobile phones (11; 52%) were perceived to be the most effective by respondents from the Department of Education. The Department of Health's respondents cited the following ICT tools as most effective in the performance of their daily duties: computers, fax, printers and copy machines (7; 78%); Intranets, telephones and data projectors (6; 67%); and laptop computers (5; 56%). Respondents from the Department of Social Development cited the following ICT tools: computers, fax and copy machines (18; 100%); printers (17; 94%); and telephones (16; 89%). Tools regarded as 'just effective' include scanners, data projectors, overhead projectors and sound/tape recorders. Information systems, management information systems, and decision support systems were not known to most of the surveyed civil servants and were therefore either perceived as not effective, or simply not used at all.

Table 16: Effectiveness of ICT applications at work (N=48) VE=Very Effective E=Effective NE=Not Effective

ICT applications and Services	Education (N=21)						Health (N=9)						Social Development (N=18)					
	VE	%	E	%	NE	%	VE	%	E	%	NE	%	VE	%	E	%	NE	%
PC	18	86	1	5	2	10	7	78	0	0	0	0	18	100	0	0	0	0
Laptop Computer	9	43	1	5	5	24	5	56	2	22	1	11	8	44	1	6	1	6
Internet	8	38	2	10	5	24	4	44	4	44	0	0	6	33	2	11	1	6
Intranets	7	33	5	24	4	19	6	67	1	11	1	11	6	33	1	6	1	6
Databases (Online)	1	5	3	14	6	29	3	33	4	44	0	0	2	11	5	63	1	6
Telephone	17	81	3	14	2	10	6	67	2	22	0	0	16	89	2	11	0	0
Mobile phones	11	52	4	19	3	14	5	56	3	33	0	0	8	44	2	11	1	6
Television	5	24	2	10	6	29	2	22	4	44	2	22	5	27	3	17	1	6
Radio	2	10	4	19	7	33	2	22	3	33	1	11	5	27	2	11	1	6
Video cameras	2	10	6	29	5	24	4	44	3	33	1	11	4	22	3	17	2	11
Video recorders	1	5	8	38	5	24	4	44	3	33	0	0	4	22	1	6	1	6
Sound/tape recorders	2	10	7	33	4	19	1	11	1	11	5	56	2	11	3	17	1	6
Overhead projector	10	48	7	33	3	14	2	22	1	11	5	56	2	11	3	17	1	6
Fax machines	15	71	2	10	3	14	7	78	1	11	0	0	18	100	1	6	1	6
Digital camera	1	5	6	29	5	24	3	33	1	11	0	0	4	22	4	22	0	0
Printer	17	81	2	10	2	10	7	78	1	11	0	0	17	94	2	11	1	6
Scanners	3	14	8	38	4	19	3	33	3	33	1	11	0	0	6	33	0	0
Data projector	2	10	8	38	4	19	6	67	2	22	0	0	2	11	4	22	1	6
Diskette	7	33	6	29	4	19	2	22	3	33	4	44	2	11	3	17	1	6
Management Information Systems	3	14	2	10	8	38	2	22	2	22	1	11	2	11	1	6	1	6
Information Systems	4	19	2	10	8	38	4	44	1	11	1	11	3	17	1	6	1	6
Decision support systems	2	10	2	10	7	33	3	33	1	11	1	11	1	6	2	11	1	6
Copy machines	15	71	2	10	2	10	7	78	0	0	0	0	18	100	1	6	0	0

4.2.13 Training required in ICT applications

The aim of this question was to identify the type of training that would enable civil servants to effectively use ICT tools for service delivery and work related purposes. Table 17 clearly indicates that a lot of training is required by civil servants to improve their ability to use ICT tools. Most respondents indicated that they would like to receive computer training, perhaps because it is the tool most used to store, retrieve and disseminate the information necessary for civil servants to operate efficiently. The following were also identified as areas in which civil servants need more training: PowerPoint presentations, file or records for management, publishing, accessing the Internet, database searching, word processing, and delivering presentations. The Department of Social Development was the only department whose respondents required advanced training in areas such as creating spreadsheets, file or records management and information retrieval.

Table 17: ICT applications or areas where training is required (N=48) T=Training KT=Kind of Training

Areas	Education (N=21)			Health (N=9)			Social Development (N=18)		
	Training needed	%	KT	Training needed	%	KT	Training needed	%	KT
To use computer programme to serve public effectively	10	48	Advanced training	2	22	Not specified	4	22	Not specified
Publishing	11	52	Basic training	1	11	Basic training	3	17	Basic training
Word Processing	9	42	Basic training	1	11	Basic training	4	22	Not specified
Internet access	8	38	Basic training	0	0	Basic training	11	61	Basic training
Creating spreadsheets	8	38	Basic training	2	22	Basic training	6	33	Advanced training
File or records for management	14	67	Basic training	3	33	Basic training	7	38	Advanced training
Compiling bibliographies	7	33	Basic training	3	33	Basic training	1	6	Not specified
Preparing presentations using PowerPoint	12	57	Basic training	2	22	Basic training	12	67	Basic training
Database searching	9	42	Basic training	3	33	Basic training	5	28	Not specified
Information retrieval	8	38	Basic training	2	22	Basic training	4	22	Advanced training
E-mailing	5	24	Basic training	0	0	Basic training	8	44	Basic training
To use the fax machine efficiently	3	14	Basic training	0	0	Basic training	0	0	Not specified
To use copy machine efficiently	4	19	Basic training	0	0	Basic training	0	0	Not specified
Delivery of presentations	9	42	Basic training	2	22	Basic training	4	22	Not specified

4.2.14 Respondent's solutions to problems

The respondents' were asked to suggest how the problems facing them could be resolved and how the obstacles to ICT utilisation for enhanced service delivery could be overcome. Each department's respondents provided their own solutions.

The Department of Education

- Staff should have access to all the ICT tools available in their departments; there should be no tools for only select groups of people within the departments. The latest technology should be available to everybody, particularly those who are at the front line in providing services to the public.
- South Africa is striving forward technologically and the government is trying hard to introduce new technologies to improve service delivery. Thus in order to keep up, departments should ensure that staff members' skills are constantly updated and developed.
- Members of the public have different problems that require different types of resources and solutions; the departments must have enough resources to manage or cover all their clients. There should, for example, be enough computers because most government services are now computerised.

The Department of Health

- Skills development through workshops and seminars. Staff should be empowered with the skills they need to use the new technologies that are constantly being introduced in government systems. This would eradicate the technical problems encountered when using ICTs to enhance service delivery.
- Sufficient funds. For any organisation to run effectively, it must have enough funds to function. Funds would enable the running of seminars and workshops to improve employees' skills and increase the number of resources that might enhance service delivery.
- Education and training. Education is the mother of success - every organisation or department needs educated staff to service the public. Civil servants who are

not trained in their respective jobs would put any government or organisation out of business as they would not be able to perform even the most basic tasks.

- Enough resources. Every department needs resources to function; without resources there is no service. Departments and the government should ensure that all the departments never run short of stationery, for example.
- Internet connections and Web access. The government should provide Internet access to all members of staff in all the departments. This would allow e-mail communication; the staff would also be able to view their departments' websites for the latest developments and/or other activities each respective department is engaged in.
- Properly functioning computers for all employees. Some departments still use very slow and old types of computers that cannot execute tasks at a high speed, which is necessary when servicing a large number of clients. Some of these computers cannot even read memory sticks which are now commonly used to store large amounts of data.
- Computer literacy courses. At least everything that is done in government requires a computer, so it is necessary for departments to arrange courses for their staff to learn how to use computer systems; without computer skills there is very little that one can do nowadays in a working environment, particularly in government.

The Department of Social Development

- ICT training is required to enable the staff to perform their daily tasks effectively.
- Staff members need to have their skills developed extensively in order for them to be able to participate in the different programmes offered by their department.
- Staff members require more resources to ensure that work is executed within a short space of time, e.g. copiers and printers.
- Internet connection and access. The Internet has become an essential tool without which work cannot be effectively done. Through Internet connectivity, information, e-mails and departmental websites can be accessed within a very short space of time.

The above results indicate that the current lack of training was seen by all the respondents as a major obstacle to the effective use of ICT tools. A lot of civil servants do not have the skills to use technological devices or to even use devices such as the Internet, databases, information systems, digital cameras, scanners, etc.

The availability of and access to ICT tools was also highlighted as a major problem a number of ICT tools that could be used to enhance service delivery are not available to most staff members. Even when they are physically available within a department, a number of these resources cannot be accessed, usually either because the civil servants do not have the necessary skills to operate them, or because access is only limited to management. The Internet is acknowledged as an incomparable information resource, but most of the respondents indicated that they had no access to it or lacked the skills necessary to work on the Internet computer literacy courses.

Respondents from all three departments lamented the lack of resources that would help them service the public in a more effective way. Some of the resources they mentioned include printers, photocopiers, new computers equipped with Internet access, and enough funds to run the departments smoothly. Respondents also pointed out that it takes time for the government to upgrade resources. Computer programmes in particular quickly grow outdated and need to be upgraded regularly. Microsoft releases new software almost annually and this on its own calls for constant upkeep and training.

4.2.15 The impact of ICT use in government

4.2.15.1 ICT tools in changing the way civil servants work to communicate with colleagues

This question aimed to get respondents views on whether or not ICT tools are changing the way work or communication is done within departments by civil servants or in servicing the public. The answers received are listed below under each department.

The Department of Education

- With the assistance of ICTs, work is accomplished more effectively, efficiently and accurately. Computers especially guarantee accuracy.
- Greater ease of communication. ICT tools remove the paper-based system of communication (posts to all). With e-mail, one can communicate with a colleague in London within seconds.
- ICT tools are very fast and can store more work. Computers can store large volumes of data in their memories; mobile phones can also load more information.
- ICT tools allow the staff to stay updated and informed about world events. Tools such as e-mails and the Internet keep departments constantly updated with the latest information.
- Improved ease with which one can install and retrieve work. A lot of ICT tools are user-friendly, which makes the loading and retrieval of information easy. It literally takes seconds to do what would normally take hours.

The Department of Health

- ICT tools provide effective communication. With ICT tools, it is guaranteed that when one is looking for somebody, he or she would be able to reach that person either via their telephone, mobile phone or through e-mail.
- Speed - information can be retrieved very fast.
- A lot of work does not need to be done physically or manually. For example, there is no need to post letters or written communicative; communication is done electronically through computers.

The Department of Social Development

- ICTs ensure that work is done effectively, especially with computers.
- Reports are now typed using computers which saves a lot of time and is much neater than handwriting.
- Faxing is easier than post - a faxed document takes minutes to reach its destination as opposed to post that could take weeks.

- Telephone access eases communication - with the telephone one can talk to the person required at any time, depending of course on whether or not that person is available.
- Things are generally more organised. ICT tools make things more professional and easy to execute.
- Communication is made much easier, even globally, e-mail facilities enable people to send message that can reach their destination overseas in seconds.
- Capturing data is easy with computers.
- ICT tools ease communication with the public and colleagues. These days communicating is easy because one need not wait for someone to be in an office to talk; some mobile phones are equipped with the Internet for e-mail access, and in any case one can phone or send SMSs.

Clearly, all the departments' employees were of the view that the use of ICT's has resulted in work being done more effectively. Communication has also become more effective and efficient, especially with the help of computers.

The respondents also felt that with ICT tools like computers, record keeping has improved dramatically. ICTs are very fast when executing tasks, e.g. very huge documents can be quickly retrieved through computers. The e-mail facility greatly assists communication within departments and among the civil servants themselves - the world can literally be traversed in seconds.

The respondents also noted that with ICTs, things are more organised, e.g. faxing and phoning speed up communication and thus save time, and typed reports make work neater and are generally easier to understand.

4.2.15.2 Internet as a change agent or assisting tool in servicing the public

Respondents were asked about their views on whether or not the Internet is changing the way work or communication is done within departments by civil servants or in servicing the public. The responses are provided below.

The Department of Education

- The public does not need to always physically come to the department for information or help now that there is the Internet.
- It is easier to disseminate information. Information can be sent via e-mail, SMSs, or telephonically.
- Through the Internet, the public gets to know more about the things that are done by the department, including new services or changes in the department.

The Department of Health

- The Internet is not for all staff members although it is available; therefore it has not changed the work methods of most staff members.
- Websites that are accessible to staff members are available only via a select number of computers.
- The department has a website that can be accessed by the general public for more information on its services and health-related issues.

The Department of Social Development

- There is a website for the department which can be accessed by the general public.
- The Internet saves time and enables persons to communicate over great distances via e-mail.
- The Internet is reliable because a lot can be achieved using its resources done through Internet.
- The staff searches the Internet to gain access to relevant departmental information.
- Information dissemination is very easy.

The above responses reflect that the Internet is not always available to departments to the extent required by the respondents, thus hampering service delivery to the public. A large

number of respondents could not comment on the helpfulness of the medium as it was only availed to senior management, and they therefore did not use it.

The Internet is believed to save time and improve reliability. The use of the Internet also eases the dissemination of information. All the respondents' indicated that their various departments have websites.

4.2.16 Recommendations as to how to improve the applications and use of ICT tools

The responses were as follows:

The Department of Education

- The department should provide more resources for the staff to function properly. Tools that are highly necessary include computers, telephones, photocopiers, scanners, the Internet and Intranets.
- Staff members need to be exposed to the latest technology. Technology is advancing on a day-to-day basis; the government or departments should adapt to the latest technology to gradually close the gap between those that are moving forward with technology and those that are standing still or being left behind.
- Access to ICT tools should be improved. Some tools cannot be accessed by some staff members, e.g. computers and the Internet. All staff members should be provided with the same opportunity to use these tools so that they can assist the public without complaining about their lack of access to these resources.
- Enough training should be introduced to enable civil servants to operate the ICT tools effectively. A lot of staff indicated that they need training to better operate the ICT tools in their offices. Departments should provide more training so that there no problems when servicing the public with newly introduced ICT tools.
- Every employee must have access to his or her own computer. All work in government or in departments requires the knowledge of a computer. This means that every employee should operate his or her own computer and avoid sharing resources because this wastes a lot of time when servicing the public.

The Department of Health

- Training and adequate ICT tools. The Department of Health requires more training on the use of ICT tools to make sure that service delivery is effectively achieved. In so doing, the department should also make sure that there are enough resources in the office to assist the public and to generally do daily office work.
- The ICT tools provided by the department to assist the public should be available or accessible to all staff members to ensure that when they assist the public, they do so within a short space of time. There would potentially be no queues in the corridors if everybody had access to his or her own tools with which to service the public.
- Skills development - not all staff members have the skills necessary to work with ICT tools, so the staff should be given the opportunity (through workshops, seminars, etc) to empower themselves with the skills necessary to meet the demands of this technological world.

The Department of Social Development

- All staff members should have Internet access. A lot can be done with the Internet, e.g. e-mail access, downloading necessary departmental documents, access to the latest departmental developments, etc. The Internet has to be accessible to all staff members, particularly those that are able to achieve a lot through it.
- E-mail accounts for all members of staff. Communication has vastly improved since e-mails were introduced - there is no need to run around looking for a colleague when one could just e-mail that person and receive a response in virtually no time.
- The staff should have access to laptop so that work can be carried out over weekends. Laptops suit social workers because they are, by design, computers that one can carry everywhere one goes. A laptop would allow staff members to continue with their work, even during their spare time at home.

- Improve employee's access to computer programmes. All manner of jobs these days requires a computer to streamline the work process or operations; when government employees do not have access to computers, they work very slowly because they are forced to use traditional ways of communicating/interacting (e.g. writing letters and documents by hand). With a computer, a lot can be done within a short space of time and with greater accuracy.
- The department could have all the required ICT tools, but if the staff members are not sufficiently literate to operate such tools, they could be a waste of government's money. Training is highly necessary to improve the skills of staff members.

The issue of training is mentioned by respondents from all three departments. Some felt that workshops could be used to alleviate the problem, although ongoing training programmes would possibly be more effective. It must be remembered that most of the civil servants were employed before ICTs had such an impact on governmental service delivery. It was also recommended that training should be extended to cover the use of various kinds of ICT tools.

The sharing of resources (such as computers and telephones) slows down the progress in departments because one employee has to wait for another before being able to continue with their work. It was, therefore, felt that if each staff member could operate his or her own computer system, jobs could be executed within a much shorter period of time.

Availability and access to ICT tools was also noted as a recommendation to improve the service delivery of civil servants. For instance, the telephone is accessible only on request through a switchboard operator, which sometimes takes a lot of time since other civil servants may also be in need of the service. Another example is the limited access or total lack of access to the World Wide Web, which is a significant provider of all aspects of the latest information (Education, Health, Social Development, etc).

Funding from government is also recommended to enable departments to equip themselves with the latest technology, which, even though expensive, is necessary. Departments would then be able to provide up-to-date information to the public and to service them as efficiently as possible. Social workers recommending that their department should be provided with laptop computers so that they could do their work during their spare time, during weekends or even during holidays.

4.3 Managers Analysis

Service delivery to the public is currently a government ‘buzzword’, and all their departments, therefore, endeavor to provide more efficient services. ICTs are important in their ability to assist in this mission. The main aim of the interviews was, therefore, to determine what specific services are offered by each department and whether ICTs have made any impact on the service delivery of the departments.

4.3.1 Service delivery

The first question aimed to determine the type of services the departments offer to the public. The following answers were received from the managers of each department.

The Department of Education

Respondents in this Department said in their own words that,

- ‘We are committed to helping the public achieve literacy.’
- ‘We are also committed to developing the public’s self sufficiency through education and by giving them life skills so that they can be independent.’
- ‘We assist the public with relevant materials and recent information pertaining to education.’
- ‘We equip the public with the skills they need to use modern technology in order for them to be in line with the citizens of other developing countries.’
- ‘We are exercising and implementing the Batho Pele strategies.’

The Department of Health

The Department of Health respondents, in their own words said that,

- ‘We offer health services to local municipalities (i.e. clinics and hospitals), traditional healers and Non-Governmental Organizations (NGOs).’
- ‘We offer healthcare services to all of the above.’
- ‘We formulate health policies, legislations, norms and standards for healthcare and
- Ensure the appropriate use of healthcare resources.’
- ‘We co-coordinate information systems and monitor national health goals and
- ‘We regulate public and private healthcare sectors.
- We ensure access to cost-effective and appropriate health commodities.
- Liaise with health departments in other international agencies and countries.’

The Department of Social Development

Respondents from the Social Development said that,

- ‘We offer social services to the public, particularly. Children, women, the youth, the disabled and older persons.’
- ‘We offer child protection services, crime prevention, attend to substance abuse matters, and assist with victim empowerment.’
- ‘We offer services such as grants to the disabled and children (crèche grants).’
- ‘HIV/AIDS services, development and research, and community development work, for instance projects focusing on sustainable livelihoods, youth development, and institutional capacity building.’
- ‘We also offer social relief care and support services.’
- ‘We do general administrative work’

4.3.2 Client satisfaction

In order to assess whether service delivery is effective, it is necessary to determine what the level of customer satisfaction is. This question, therefore, sought to gauge the departments’ managerial perceptions of their clients’ satisfaction levels with their services.

The Department of Education

The view of respondents was that owing to certain challenges that are facing the department, it was difficult to satisfy all. Problems stem from access to sufficient physical and human resources (e.g. a general supply of office materials). Environmental factors also pose a lot of obstacles, for example some (regional) areas are not easily accessible, crime is rampant, and there are faction fights. Each of these issues prevented officials from reaching specific areas.

The Department of Health

It was the view of the Department that, generally, clients seem satisfied, since the Department did not receive many complaints about services. Its because people are not the same, some are never satisfied; from time to time we receive complaints. Complaints could be received at different times but that this was infrequent.

The Department of Social Development

The respondent felt that there was a huge service demand for it but unfortunately had few employees because social work is a scarcely acquired skill. There are very many orphans and there was a huge waiting list for services that would satisfy the needs of the public at large.

In my opinion, some clients indicated satisfaction, although there were complaints. People are not the same and have different needs. Some come with problems that the Department could not resolve with, but in such instances there were referred to other parties..

Technologically, the Department was not that advanced, so it would still use paper in most cases; computers are mainly used for typing reports. As the Social Development Department, we are rarely used computers as far as servicing the public is concerned.

Geographically, the Department had many people to service, thus it could not satisfy all needs of the public at one go, especially with the limited resources that it had.

The Department said that, some people are serviced in their homes, so it had a huge problem with transport (too few cars are available), as well as bad road infrastructure. Some areas are not easily accessible, especially during rainy days. It often failed to provide services to such areas. This situation could understandably cause dissatisfaction on the side of the clients.

Each social worker is also expected to service a specific group of people. If that social worker is promoted or resigns from her or his position, it causes problems because those clients have to be moved to somebody else who might approach that case differently.

4.3.3 Utilisation of ICTs

This question aimed to provide an insight into the use of computers during the service delivery process, and also to determine what the perceived impact thereof is on the whole process. The departments' managers answered as follows, in their own words

The Department of Education

- 'Computers have been used for more than a decade now in the department, but their utilization is still minimal because some staff members have no knowledge of how to use them (computers). An even greater problem, however, is that in some offices, there are no computers at all.'
- 'The computers that are used have a lot of impact in terms of processing data, results, data capturing, and the storage of information, as they help the staff achieve faster results and have reduced the need to use paper files.'

The Department of Health

The Department of Health officially said that:

- 'Within the district, there are not that many services that need a computer in order to be dealt with, except perhaps for typing and storing a document.'

- ‘Computers are used to access the departmental Intranet (in existence since 2000) for communication purposes, but this is not used to provide services to our clients. Their use thereof has had a huge impact in terms of the speed at which communication is executed. Communication is now easy and there is no need to move around physically to maintain contact with others.’

The Department of Social Development

For this Department the senior officers in their own words said that:

- ‘Every social worker now has a computer on his/her own desk to use for work purposes. This has led to a huge improvement in the work environment as reports are now typed and very neat. Computers have templates, so we just type the information in, which saves time and produces accurate reports.’
- ‘The introduction of computers in our department dates back to 1997, but they have been introduced at different periods in all the offices within the department. They have made a huge difference in service delivery over the years, and the e-mail facility has made the HOD’s (Head of Department’s) communication very easy.’

4.3.4 Level of computer literacy

This question sought to determine perceptions on the level of computer literacy of the civil servants and the overall attitude towards the use of computers in servicing the public. The respondents indicated the following.

The Department of Education

The Department’s official said that,

- ‘Most of the staff displays a positive attitude towards computers because work is reduced with their help. They keep a lot of documents in their memory and make it easy to produce learning materials for schools and to process data after it has been collected.’
- ‘Most of the staff can use computers for basic tasks, although most still need some development.’

The Department of Health

The senior official of this Department said that,

- ‘Generally, the attitude is good, especially among those working with computers on a daily basis. The staff members are very happy as they see work being done much faster than before. The only staff members that are not computer literate are the cleaners.’
- ‘Basic computer training is given to the staff members who work with computers on daily basis.’

The Department of Social Development

For the Department of Social Work, senior staff said that,

- ‘Staff have a very positive attitude towards the use of computers, and majority of them can use computer application programs such as Word Processing pretty well.’
- ‘They are willing to learn, and the department provides basic computer literacy sessions to improve their level of computer knowledge.’
- ‘Staff can also use e-mail accounts, although very few computer systems have them.’
- ‘Through their personal training and departmental assistance (i.e. through computer lessons), most of the staff is now computer literate and work is moving very fast.’

4.3.5 Difficulties experienced in the provision of service delivery programmes

The aim of this question was to determine the difficulties the department’s face in delivering services to the public.

The Department of Education

- Physical and human resources - we simply do not have all the required resources.
- As mentioned earlier, environmental factors also pose huge stumbling blocks.

The Department of Health

The senior official of this Department said that,

- ‘Lack of resources is a problem. For instance, there is not enough space to accommodate all the service stations that we need to have as a department. We can’t service our clients freely because of the unavailability of space. Even in hospitals, there is a shortage of space in wards where patients share the same buildings.’
- ‘Road infrastructure is a problem. For example, if a patient living in a deep rural area needs an ambulance, the roads are often of such a nature that the ambulance has to park at a considerable distance and the person carried for kilometers to reach help. This sometimes results in a patient dying on the way to the ambulance.’
- ‘There is a shortage of mobile clinics in areas where there are no fixed clinics. In most cases, one mobile clinic services a very large geographical area; these clinics also move and are not available at nights.’
- ‘Transport (ambulances) is a big challenge, especially in rural areas where people are living in scattered settlements and places where a car cannot reach. We do not have enough ambulances to serve the multitudes requiring help.’
- ‘There are not enough computers to satisfy the needs we have. When we apply for them, it takes time for the applications to be approved (let alone the time taken to deliver them). All the applications have to go through the head office, and from there they are sent to SITA (State Information Technology Agency) for approval and delivery.’
- ‘The main challenge we face is the shortage of professional staff, i.e. doctors, pharmacists, nurses and radiographers. A lot of diseases that require trained staff, which we simply do not have enough of. There is a lot of overtime being worked by the available professionals, but this is not doing us any good.’

The Department of Social Development

The senior official of this Department said that,

- ‘Currently, we don’t have Management Information Systems.’
- ‘There aren’t enough e-mail accounts to enable easy communication within the department. During server down-times, we experience a lot of difficulties since e-mails are now used quite extensively.’
- ‘Limited Internet access. With the Internet, we would easily adapt to the changes that may occur in the department by just downloading the necessary documentation informing us of those changes.’
- ‘There are times when the network is not reliable.’
- ‘IT support is not enough to support the number of offices that we have.’
- ‘Our biggest problem is resources, particularly transport. Our offices support people coming from deep rural areas and there are too many clients to be serviced, so we can’t assist them with our small personnel numbers.’
- ‘Some of our offices suffer from space-related problems - factors such as storage space are causing havoc. Since the department was divided into Social Development and SASSA (South African Social Security Agency), we all need space and resources to service our different clients and their different needs.’
- ‘We don’t have cell phones to communicate with our fieldwork staff in case we need to communicate with them.’
- ‘Laptop computers are urgently needed because most of our employees work in remote areas. This would alleviate the need to come and work at the computers in the offices. If laptops were available, work could be done onsite.’
- ‘Troubleshooting and repairs are a challenge, as we rely on IT Staff from the regional offices for computer repairs. This takes a lot of unnecessary time.’
- ‘Computer viruses are also a major challenge. Since we rely on IT staff from the regional offices, we have to wait for them to service or update anti-virus programmes, otherwise significant damage is done by the viruses to our documents.’

4.3.6 The effect of the availability of computers on improving service delivery

This question sought to determine whether the use of computers could improve the departments’ current service delivery to the public.

The Department of Education

- Computers are very much needed and can improve service delivery tremendously.
- Access to the Internet would improve our work capability enormously.
- Computers would seriously improve service delivery by allowing the staff to move away from paperwork and do a lot of work electronically. This would enable work to be done within a much shorter space of time.

The Department of Health

- Computers first need to be available to improve service delivery (currently they are mostly unavailable and therefore not used). The department should certainly provide computers with Internet access, so that we could access the latest developments in the department and don't have to wait for circulars each and every time; we could instead use the Net and get the relevant information timorously.

The Department of Social Development

- E-mail services would boost communication within the department.
- By providing full access to the Internet, the scope of workers as well as clients would be widened.
- By having Intranets, communication between the civil servants and the Head of Department would be improved.
- Management Information Systems would improve service delivery.
- Computers would allow the staff to track the information of clients, like their intake (when the client was first serviced), and so on.

By having all records stored electronically, access to them is made much easier and faster.

4.4 ICT use

Clients using the services offered by the departments were targeted by way of interviews. The Department of Health's clients did not form part of the interview schedule - their clients consist of traditional healers, NGOs and municipalities who were not easy for the researcher to reach.

4.4.1 Services required by clients

This question sought to determine the kind of services each client required from the different departments.

The Department of Education

They responded as follows in their own words:

- Client 1: 'I need applications for rendering food services in schools around the district.'
- Client 2: 'I submitted claim forms for services rendered to the department.'
- Client 3: 'I applied for a Matric certificate.'
- Client 4: 'I renewed teaching contract.'

The Department of Social Development

They responded as follows in their own words:

- Client 1: 'I applied for an old age pension.'
- Client 2: 'I applied for a child support grant.'
- Client 3: 'I applied for foster care.'
- Client 4: 'I review child grant application.'

4.4.2 Frequency of departmental visits

The clients were asked the number of times they came to the department for services. Frequent visitors would be better able to provide an opinion of improvements/or their lack thereof in service delivery over time.

The Department of Education

They responded as follows in their own words:

- Client 1: 'I come every three months to renew my contract.'
- Client 2: 'This is my first time coming for help.'
- Client 3: 'I have come here several times when I submit my claims.'
- Client 4: 'I normally come to check schools that require service of supplies.'

The Department of Social Development

They responded as follows in their own words:

- Client 1: 'I used to come for the renewal of my child support grant.'
- Client 2: 'I come several times.'
- Client 3: 'I have been here a number of times trying to apply for a pension.'

4.4.3 Satisfaction with service delivery

This question sought to determine the level of satisfaction of the clients with the type of services they received when they went to a department for assistance. Responses from the Department of Education's clients ranged from being satisfied (she/he got the required form) to being left unsatisfied. Two indicated that they were partly satisfied. Of the respondents from the Department of Social Development, one was satisfied and the one was not satisfied at all.

4.4.4 Problems faced during the service delivery process

When asked whether they faced problems in dealing with the respective departments, their answers were as follows:

The Department of Education

- Client 1: This client said that, ‘sometimes the progress is very slow and it takes time to process the claims. Computers are sometimes reportedly not working. There isn’t enough staff to service all the clients.’
- Client 2: This client said that, ‘there is favoritism in the supply of tenders. Customer care is questionable. I once stayed for more than an hour waiting to be serviced. There are a lot of people waiting to be serviced and a limited number of computers. There is a lot of sharing of computers.’
- Client 3: Client 3 said that ‘stationery is sometimes not available, especially forms. Some staff members are not computer literate and cannot deal with clients using computers.’

The Department of Social Development

- Client 1: ‘This client said that, ‘customer care is not practiced; for example, if you are a newcomer, there is no one to give you directions as to where you should go.’
- Client 2: This client said that ‘favouritism - some people are attended to before others, even though they arrived late.’
- Client 3: This client said that, ‘there isn’t enough staff to deal with all clients.’
- Client 4: This client said that, ‘there aren’t enough working materials, e.g. stationery, and particularly application forms.’
- Client 5: This client said that, ‘files sometimes get lost, and you have to come back a number of times.’
- Client 6: This client said that, ‘there are not enough computers to deal with the clients’ demands; the staff share computers, which wastes a lot of the clients’ time.’

4.4.5 Improvement of service delivery through use of computers

The question aimed to solicit the client’s views on whether or not the introduction of computers has improved the service delivery of the departments.

The Department of Education

- Client 1: This client said that, 'they are helping a lot, but since there are not enough, one can't see that they are really helping in improving service delivery.'
- Client 2: This client said that, 'yes, computers have changed the world and the way work is done. Computers can simplify a very difficult task in a few seconds.'
- Client 3: This client said that, 'i know nothing about computers; I just filled the application form for my Matric certificate and left. I was not helped with/through a computer.'

The Department of Social Development

- Client 1: This client said that, 'i think it has because civil servants just do things on the computer and the results come very fast. Everything they do has been improved with the availability of computers.'
- Client 2: This client said that, 'they have in part, but because computers are not enough, the difference they make is sometimes not clear.'
- Client 3: This client said that, 'i know nothing about computers. I hear people say they do a lot of things.'
- Client 4: This client said that, 'yes, because things are now done more easily than before.'

4.4.6 Ability to use computers from home or at the department for improved service delivery

This question sought to determine the clients' ability to use computers on their own when they are given a chance to do so at the departments' service points or from home. It also aimed to determine what problems would hinder such usage. The following answers were received.

The Department of Education

- Client 1: This client said that, 'no, I don't know how to use a computer.'
- Client 2: This client said that, 'yes, because I am computer literate.'

- Client 3: This client said that, 'yes I can, although I am not used to the programs they use at the Department of Education to run their work.'
- Client 4: This client said that, 'no I don't know the system they are using to service their clients.'

The Department of Social Development

- Client 1: This client said that, 'yes I can, because I learned how to use a computer at a training college.'
- Client 2: This client said that, 'no, because I don't know how to use a computer.'

4.4.7 Suggestions for improvements in service delivery

The clients were asked what can be done to improve service delivery in the various departments. They suggested the following:

The Department of Education

- Client 1: This client said that, 'providing service stations within the departments where people can use computers themselves in applying for services. More computer literate staff and more computers, so that work can be done faster.'
- Client 2: This client said that, 'eradicating favoritism and having enough stationery at all times.'

The Department of Social Development

- Client 1: This client said that, 'by servicing people fairly - all people are equal, there is absolutely no need for staff members to engage in favoritism when they service people.'
- Client 2: This client said that, 'employing more staff members. There is a shortage of staff into some departments which slows everything down, particularly in instances where one staff member has to service a large number of people. This often leads to long queues that are left unattended.'

- Client 3: This client said that, 'more working materials. Some departments keep running out of tools/resources that can also adding to the slow processing-rate of the departments.'
- Client 4: This client said that, 'clear directions should be provided to first-time clients. Some departments are located in large buildings with no signs pointing to where the different services are offered. Social development clients are mostly old people who can't walk up and down the steps, so there have to be directions and staff members to assist the public.'
- Client 5: This client said that, 'the number of computers needs to be increased so that civil servants don't have to share them.'

4.4.8 ICT availability at home for improved service delivery

Clients were asked whether they possessed computers in their homes, and also what other types of ICTs are available in their homes that could potentially be used to improve governmental service delivery.

The Department of Education

- Client 1: This client said that, 'yes, I have a computer. I have a laptop computer, telephone, television, radio, mobile phone and the Internet.'
- Client 2: This client said that, 'i have a television, mobile phone, radio, and telephone.'
- Client 3: This client said that, 'yes, I am in possession of a computer, fax machine, radio, television, telephone, mobile phone, video camera, and video recorder.'

The Department of Social Development

- Client 1: This client said that, 'no I don't have a computer at home'
- Client 2: This client said that, 'yes, I have a telephone, computer, mobile phone, radio and television. '

4.4.9 Opinions on the feasibility of delivering services at home using ICTs

This question sought to determine whether or not the services provided by the departments can be provided to clients in their homes with the help of a computer, cell phone or other ICT devices. The following answers were received:

The Department of Education

- Client 1: This client said that, 'no they cannot.'
- Client 2: This client said that, 'yes. Forms to apply for tenders can be faxed to me; I'd fill them in and sign them, then fax them back to the department.'

The Department of Social Development

- Client 1: This client said that, 'no they cannot'
- Client 2: This client said that, 'yes, if they can phone or allow us to phone and apply for grants.'

4.5 Summary

A large number of the respondents from the staff in the departments indicated that they lacked the ability to use a number of ICT tools that could help them effectively service the public. They, therefore, cited the need for training programmes that would allow them to learn the necessary skills. It was also revealed that many relevant ICT tools like databases, the Internet, overhead projectors, scanners, information systems, radio, television, and laptop computers were not in use by the departments under investigation. The Internet is not often used by civil servants when servicing the public, even though it is regarded as an excellent informant in all aspects of life, and even while it is acknowledged that the e-mail is the best way of communicating with people from around the world within the space of seconds.

Interviews with both the staff and clients revealed that there are problems that hinder the use of ICTs in enhancing service delivery to the public. It was generally noted that there are not enough staff in the departments to service the public. ICT tools also were not

enough to service large numbers of people, particularly tools such as computers, telephone lines, laptops, and mobile phones. It was also said that the Internet and e-mail facilities are not accessible to all staff members, although there is a lot of necessary information that can be obtained through these tools.

Interviews with clients indicated that there is still favouritism in some of the departments, in that some staff members pick their friends or relatives from the queues and service them first at the expense of the people who came very early to seek services. Clients mentioned that there were not enough resources to service them because at times they came for services and were told that there were no papers or forms and/or that the computers were not working.

Chapter five discusses these and other findings.

CHAPTER 5

DISCUSSION

5.1 Introduction

The primary aim of the study was to examine the use of ICTs to improve service delivery to the public in a chosen number of government departments in the uMhlatuze Municipality. This chapter discusses the findings from responses to two sets of data collection tools, namely questionnaires and two interview schedules. The responses were obtained from civil servants and clients from the Departments of Education, Health and Social Development in the uMhlatuze Municipality. Issues that are discussed in this section include, among others, the types of ICT tools used by civil servants; their level of interaction with ICT tools and services; level of access to the ICT tools, specifically referring to Internet services; the amount of time spent using ICTs for work-related purposes; the ICT training needs of civil servants; client satisfaction with service delivery; and challenges and suggestions for improvement with regard to the use of ICTs for service delivery.

5.2 Nature of the Services Provided by the Civil Departments

As a starting point, the study set out to investigate the nature of the services provided by the three selected civil service departments. These particular departments were selected because they provide core services that influence the day to day activities of the populations they serve. Thorough investigation of the use of ICTs in these departments could, therefore, enable the benchmarking of other civil service departments. A literature review of the services provided by the selected departments summarily revealed the following:

- The Department of Education provides services relating to education and training, administration of schools and tertiary institutions, and accreditation of programmes and quality assurance (South African Government Services, 2008).
- The Department of Health serves the needs of clinics and hospitals in the region as well as the staff servicing these institutions. In aligning with international standards, the department liaises with Health Departments in other international

agencies and countries and provides health-related information to the general public. The department is also responsible for formulating health care policies, legislation, and norms and standards for health care.

- The Department of Social Development offers services related to child adoption, early childhood development and the administration of various grants.

Given the magnitude and the significance of these services, the use of ICTs is inevitable (see Section 5.3). This is confirmed by Sopchokchai (2004, n.p.) who states that ICTs can benefit service delivery by improving access to services and ensuring less time consuming interaction; customizing service offerings tailored to citizens' specific needs; improving transparency and building trust; encouraging more active citizen interaction and democratic participation in decision-making; improving citizen services; and delivering accurate and dependable services.

5.3 ICT utilisation by Civil Servants

According to Enakrire and Onyenania (2007:n.p), technological networking in Africa is mainly hampered by the continent's weak ICT (information and communication technology) infrastructure. As indicated previously in Chapter 2 and concurred by Mutula and Mostert (2008), the ICT infrastructure of a country acts as backbone to its ability to provide ICT utilities and services that can effectively be used by the government and the general public. Through the use of ICTs at government level, improved service delivery and access to vital development information can be provided to the citizens of a country. Enakrire and Onyenania (2007:n.p), however, point out that digitised strategic information for improved and sustainable development is non-existent in most African countries. This is mainly because of the continent's general lack of exposure to what freely accessible communication technologies can do to improve the flow of information.

In contrast, South Africa has relatively a well developed ICT infrastructure, providing both the government and the general public with access to information and many ICT tools and services (see Chapter 2). With most developed governments' current emphasis

on improved and effective service delivery, South Africa's ICT initiatives should, therefore, be seen in a very positive light.

In the course of the last decade, the South African government has invested heavily in providing ICT tools to its departments in order to elevate and improve the standard of service delivery to the public (Mutula and Mostert, 2008). ICT services were introduced to ensure that services are provided in a much shorter time than previously possible through manual methods (Megan, n.d.). Table 9 illustrates the number and variety of ICT tools made available to the respective departments. However, the fact that ICTs are available does not necessarily indicate use, or when used, it also does not indicate that they are used to improve service delivery; for example the Department of Education only had three computers to render services to the public, with only one (computer) at the Department of Health and 4 at the Department of Social Development. The same trend was noted with the other available ICT tools (see Table 9). The findings, therefore, suggest that despite the government's best intentions, ICTS are still generally not used in many of the government offices, particularly not for enhancing service delivery.

There are many possible reasons for this, such as lack of funds on the side of government, lack of lobbying on the side of departmental managers, and/or the influence of human factors such as fear of change, poor acceptance or attitude towards ICTs, lack of skills and awareness, and slow adoption of ICTs among the staff. With respect to staff related issues, Borgman (2000) notes that although the advent information or any other new technology makes possible all sorts of new activities, people still find it very difficult to discard old habits and practices.

As indicated in Sections 2.6 and 2.7, a large variety of ICTs, such as computers, fax machines, digital cameras, and telephones (both landline and mobile) were available and could potentially be used by the government to facilitate the delivery of government services to the public. The type of ICTs used generally depends entirely on the services rendered. As revealed in Sections 4.2.3 and 4.2.5, there were a large number of ICT tools that were either not available or not used (when available) by civil servants in all the departments, such as video cameras, video recorders, scanners, radio, data projectors, and

databases. Even recent technologies such as the Internet and e-mail, which greatly enhance communication, were generally not available or used by the departments in question (Section 4.2.9). The ICT tools most commonly used by civil servants in all the departments include computers, telephones, fax machines, and copy machines. Mobile phones were also used quite often by civil servants in the Department of Health, while Intranets were popular in the Departments of Education and Health. The under-utilisation of ICT tools and equipment within the public services sector is critical as it hinders effective service delivery and quality of service. This issue can be addressed through intensive training; by updating skills; ensuring that quality tools are available for work; implementing effective policies; and instituting a positive attitude by staff towards ICT utilisation (The Development of the Plan Development Framework: The Guidelines and General Principles: n.d.). Furthermore, it is essential to make IT literacy and basic computing skills a requirement for promotion and employment within the civil service sector.

It was found that civil servants in each department underutilized or did not use a number of ICTs that were specifically available to them for service delivery. As indicated in Table 9, most of the respondents from the Department of Education indicated that they did not use several of the available ICTs, e.g. the Internet (86%), video recorders (86%), video cameras (76%), online databases, and radio (71%), sound/tape recorders, data projectors, digital cameras, and scanners and television (61% each). Of course, the poor use of ICT tools by this department could be because it does not necessarily need the above mentioned ICT tools to deliver its services.

Civil servants from the Department of Health indicated that laptop computers, online databases, radio and sound/tape recorders (56% each), Internet, television, video recorders, video cameras, overhead projectors and scanners (44% each) were not readily used to enhance service delivery. The poor use of these ICTs might once again reflect the type of services offered. The main exception would be the Internet, which is always potentially useful. However, as previously mentioned, the Internet is not freely available to the department's offices for service delivery purposes.

A similar pattern was observed at the Department of Social Welfare. The department normally deals with social issues, e.g. offering pensions to old-aged citizens or offering grants to children. For this reason, there may not be any need for this department to use some of the ICT tools to deliver services to the public, such as video recorders, video cameras and data projectors.

5.4 Access to ICT tools

The findings of the study suggest a varied level of access to ICT tools in all three departments. Certain ICT tools could be accessed in some departments but not in others. This is evident in Table 6, which illustrates for example that the Internet, video cameras, video recorders and the radio were the least accessible ICT tools in the Department of Education, with each receiving a score of over 70%, while access to these tools was found to be reasonable in the other departments.

The number of ICT tools available and the level of access to most of these ICT tools by civil servants in Umhlatuze Municipality was generally found to be low. This is again illustrated in Table 6 where a number of ICT tools in all 3 departments were cited as inaccessible. The South African Government has introduced a lot of IT-related initiatives to assist or uplift the level of use of ICT tools by government employees, such as SITA (State Information Technology Agency), Govtech, Savant, Arivia.kom, Acacia and Infracore, to name a few. Given the findings, these initiatives do not appear to be effective at the lower tiers of government. Part of the problem could be that no training sessions are offered to civil servants to help them understand how these initiatives work and/or how they could benefit from them. For this reason, a number of civil servants working in the lower levels of government don't even know how to boot a computer system.

The fact that there is limited access to ICT tools by civil servants suggests that the services offered may be slow and/or poor. This was corroborated by the staff during the interviews, where some indicated that they didn't know how to operate a computer system. A few civil servants from the Social Development Department also indicated that because they service a large geographical area, it is very difficult to service the population

properly because of lack of access to ICT tools. Should these tools, such as computers and the Internet, be made more accessible, better service delivery could take place. However, they also pointed out that lack of electricity in many of the areas would hamper the use of ICTs, even if they were accessible.

According to the Data Protection Staff Handbook (2003:1), the Internet can lead to enhanced business opportunities and advantages when utilised properly and responsibly. For example, departments can improve the way they service the public by communicating via email with those that have access to email services and with computer literate citizens who cannot physically go to their nearest offices because of their age or because of disability or illness. Kuye and Naidoo (n.d.) suggest that the Internet makes communication possible between three basic entities, namely businesses, government and the citizens. The Internet improves the way people access government services. As in the above example, people can send emails to ask for services, and have the opportunity to download useful government news directly from the Internet without visiting any government office. Through the Internet, the government has developed websites for each department that allow citizens to log in and get the latest information about the services offered by the departments, while sitting in front of a computer. The reliability of the Internet provides citizens with better information and new knowledge, allowing them to make faster and more informed decisions.

Despite all the obvious advantages of the Internet and its associated services, these services were in most cases not used by most of the respondents in the departments in question. The respondents suggested that the main reason for this poor or non-use is hierarchical - those in lower departmental positions do not have access to Internet services; Internet services are mostly available on senior management's work stations only. Table 9 highlights this: 10 (48%) respondents from the Department of Education indicated that they did not have access at all to the Internet, 3 from the Department of Health (33%) cited the same, and 13 from the Department of Social Development (72%) indicated that they didn't have Internet access.

From the interviews with clients, it also became clear that lack of access to available Internet-based governmental services contributed to (clients) having to waste a lot of time in queues or trying to locate where the services are rendered. If the government could connect Internet to its employees' workstations and properly train its staff to use Internet services and add public Internet stations that would allow the computer literate public to access the information they may be looking for, a lot of time could be saved, effectively doing away with the long queues in our government offices today. The government has already acknowledged that it should make Internet services available to civil servants in order for them to improve service delivery to the public. Similarly, the Internet should be made available to clients at appropriate access points within the municipality to reduce the long queues that form at departmental offices.

5.5 The level of satisfaction of clients with the services rendered

The levels of satisfaction of the clients with the services varied, with some clients indicating satisfaction and others not. Reasons for dissatisfaction included favouritism, the incompetence of civil servants, the observed shortage of computer systems (which resulted in civil servants sharing computers to assist the public), and the civil servants' lack of computer skills. All of these resulted in slow progress and long queues. Constable, Mabena and Majanja (2007:3) have argued that services need to be provided neutrally, reasonably, justifiably and without bias. The interviewees suggested that in many cases there is a shortage of stationery in some departmental offices, where a client would come for a service only to be told that there are no forms available. This would understandably cause a lot of unhappiness on the part of clients. A possible solution would be providing computer terminals which clients could use to fill out their forms. Another common complaint had to do with the slow pace at which services are rendered. For example, one respondent stated that it sometimes took up to two hours to service one or two people, this could stem from the small number of civil servants employed by the different departments and/or the lack of ICTs to speed up procedures.

The Department of Public Service and Administration (2008:n.p.) states that national departments and provincial administrations are required to publish standards for the level

and quality of the services they provide. Service standards must be relevant and meaningful to the individual user. This means that they must cover the aspects of service that matter most to users as revealed through a consultation process, and set up in terms that are relevant and easily understood by their users or clients. To attain these lofty ideals, serious investment in ICT tools and the training of staff for optimal utilisation should be considered by office managers.

5.6 Frequency of ICT utilisation by Civil Servants for official use or rendering public services

According to the Ghana Resource Centre (2008:n.p), it is very important for all government employees to equip themselves with the latest ICT skills to reflect the government's drive to enhance service delivery. From the findings of the study, it became clear that although the departments were equipped (to a degree) with useful ICT tools, they were not frequently used for service delivery. For example, in the Department of Education (see Table 13), a fairly high number of ICT tools were not used on a regular basis or for long hours. Tools in this category include laptops, the Internet, Intranets, television and digital cameras, databases and scanners, video, sound/tape recorders, radio and data projectors, PCs, telephones and printers, overhead projectors and fax machines. At the Department of Health, videos, sound/tape recorders, laptops, television, overhead projectors and digital cameras infrequently, while PCs, Intranets, and telephones were the only tools used between 6-10 hours a day to service the public. Fax machines and printers were generally used at least 1-5 hours a day. Based on the above results, this department generally uses the 'normal' ICT tools found in government departments for most of the day. The same trend could be observed in the Department of Social Development where very little time was generally spent on ICT tools; for example fax machines, printers and copy machines were used for less than an hour a day, while PCs and telephones were only used between 1-5 hours a day. From the above, it is clear that in most cases, departments still provide services using manual methods, e.g. paper and pen, instead of computers.

5.7 Training needs in the utilisation of ICT tools

The Ghana Resource Centre (2008:n.p) suggests that training sessions for civil servants and community members would allow them to use the acquired ICT knowledge and skills in their daily work and activities. Petty (2007:n.p) also argues that because of governments' continuous move towards e-government culture, civil servants should be involved in ICDL (International Computer Driving License) programmes that would help them empower themselves with the necessary IT skills so that they may be able to assist the public effectively with ICT-related services.

Lack of training has been identified as a serious obstacle to ICT-enhanced service delivery. This is highlighted by the results in Table 17, where for instance in the Department of Education, respondents stated that ICT training was necessary to help them effectively use computers (48%), for publishing (52%), electronic records management (67%), PowerPoint presentations (57%), database searching and word processing (42% each), Internet access and creating spreadsheets (38% each). Respondents from the Department of Health stated that training was necessary in electronic records management and database searching (33% each), using computer programmes, creating spreadsheets, PowerPoint presentations and information retrieval (22% each). At the Department of Social Development, respondents indicated that they required training in areas such as PowerPoint presentations (67%), Internet access (61%), e-mailing (44%), electronic records management (38%), creating spreadsheets and using computer programs (22% each). From the interviews with employees from the respective departments, it became clear that many of the problems in using ICTs stemmed from the following:

- most of the employees from the Department of Education were employed before the tools were introduced to government. Many had never attended any training that could empower them and ensure that they would be ready for any changes that would occur (as far as ICTs are concerned).
- interviewees from the Department of Social Development suggested that a poor understanding of how a computer works and how it can be used to improve service delivery becomes a serious obstacle when computers start being used more and more often for service delivery.

- the Department of Health's interviewees saw themselves as being computer illiterate and therefore unable to deliver the service levels expected from them when using ICTs such as computers.

The fact that some civil servants could not operate even basic computer application programmes that normally get used in offices, such as Word processing, Word perfect, Excel and or Powerpoint, is a significant challenge. Clearly, civil servants require training that covers virtually all recently-introduced ICT tools because they are hardly able to operate the most basic of these (tools). The fact that such a high number indicated that they require basic training suggests that very little ICT-related knowledge or no knowledge at all currently exists among civil servants. The government should, therefore, urgently train its employees if it expects to accelerate service delivery through ICTs.

5.8 ICTs and service delivery: issues and challenges

According to Skweyiya (1998:6), achieving a changing public service sector is based on the quality of human resources. The challenge is to ensure that the skills and capacity of the public servants are regularly improved to meet the changing requirements of the public they serve. The current lack of specific skills among civil servants needs to be addressed in order to upgrade their capacity to deliver quality services. A challenge mentioned by staff was the inability and frustration they experienced when providing services to their clients via computer systems, especially when an error occurs during the process and they are unable to solve the problem. In this case, clients have to leave without getting assistance. There are currently certain general training programmes, such as Public Service Orientation Training, Ethics and Values, Customer Service, and Guides for Public Policy Development that public servants can choose from in order to attain the skills necessary to service the public effectively. However, the question remains as to whether there are any real efforts being made to provide effective ICT training to those staff members who need it.

A major challenge facing clients when they visit government departments is the amount of time (usually hours) it takes to process things like claims. Often, computers intended

for service delivery are not functional, resulting in people standing in long queues while waiting for assistance. Shortage of staff and lack of training only compound the problem. The latter seems to be particularly endemic to Africa, is confirmed by Maphunye (n.d.), who reports that the shortage of skilled personnel in many African countries is sometimes related to unsuitable recruitments and appointments that lead to bad governance, maladministration and mismanagement.

Benton (2007:n.d) also mentions that managers within government departments are not normally that skilled in the use of technology. As a result, they cannot make use of newly introduced IT resources that are meant to enhance service delivery to the public. It follows that if the managers are not skilled, they cannot adequately assess and promote the way ICT tools are used by the civil servants.

During the interviews with clients, some complained that files with their particulars sometimes get lost, resulting in them having to go back repeatedly or sometimes being instructed to start afresh and reapply for the same services. This is often either the result of human error or could mean that there is no proper file management system in place. ICT tools such as computers can solve this problem because they can be used to save all the records of a client that attended a department for a service, ensuring that his or her file can be easily retrieved from the system when necessary.

Sharing of resources was also cited as a challenge because it can be extremely time consuming. Civil servants don't have the same abilities when it comes to using ICT tools; thus it may take a while for one staff member to retrieve a document while others have to wait. It may also happen that some staff members may want to work on a different programme altogether, thus slowing the computer down by having to keep switching between programmes. This is an especial problem when there is a lack of skills.

Many of the problems can be addressed by dedicated office managers and by a government that is serious in its quest to deliver efficient services to the public. This does, however, also require employees that are open-minded and have a positive attitude towards change

and customer care. As suggested by the civil servants, more resources, such as computers, telephones, photocopiers, and scanners, would improve their efficiency. Furthermore, services such as the Internet and Intranets should become common place in their workspaces and not just be allocated to senior management. A strong sentiment for the acquisition of the latest available technology was also expressed as it would help civil servants bridge the digital divide.

5.9 Conclusion

The study revealed that not all ICT tools are generally available and/or used by civil servants in the uMhlatuze Municipality. The only ICT tools found and sometimes used by civil servants, at least in their daily tasks of servicing the public and performing their office duties, include computers, telephones, fax machines, printers, and copy machines.

It was also found that most new technologies were not used, not found, or could not be accessed by civil servants in the departments, e.g. the Internet, laptop computers, databases, video cameras, video recorders, sound or tape recorders, overhead projectors, and information systems. The government also does not appear to make much use of radio and television, which are mediums that are often used in this country for communication.

Several problems have also been discussed in this chapter, such as skills shortages, the need for training, and the problems encountered when having to share resources (e.g. computers).

The next Chapter discusses summary, conclusion and recommendations. (Chapter 6)

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter summarises the research findings and proposes recommendations for the uses, impact and interaction of information technologies among civil servants in the uMhlatuze Municipality. The aim of the study was to investigate social informatics in the context of service delivery in uMhlatuze Municipality. The objectives were set to break the aim down into more specific, measurable, and timely units. The objectives of the study were as follows:

- to determine the nature of services provided;
- to establish the types of ICTs currently in use by uMhlatuze Civil Servants;
- to explore the type of interaction with ICTs among Civil Servants in the uMhlatuze Municipality;
- to explore the impact of interaction with ICTs among Civil Servants in the uMhlatuze Municipality;
- to determine training needs of Civil Servants in as far as the effective ICT utilization is concerned;
- to determine challenges faced in service provision and
- to determine user satisfaction with services delivery.

6.2. Summary

This section summarises the findings under each of the study's objectives. It serves to illustrate how the research questions and objectives were answered.

6.2.1 The nature of services provided by Civil Servants in uMhlatuze Municipality

The services (described in section 1.1.6) to the public differs according to which Department offers them.

The Department of Social Development offers social services to the public such as child protection service, crime prevention, substance abuse matters, victim empowerment, disabled and child care (crèche grants). HIV/AIDS services are also provided including

others such as development and research, community development work for instance: projects like sustainable livelihood, youth development, institutional capacity building and support, social relief care and support services, and general administrative activities.

The Department of Education offers services like: skills to use modern technology in order to be up to date with the latest technological developments in the country, providing access to relevant materials and recent information pertaining education, instituting educational initiatives and life skills course to provide the general public the opportunity to become self sufficient and independent, and by helping the public to become literate.

The Department of Health offers health care services to Municipalities, traditional healers and non-governmental organisations.

6.2.2 Types of ICTs used by Civil Servants

As a starting point, the study aimed to identify the types of ICTs used by civil servants in the Departments of Education, Health and Social Development. The study found that there was a considerable variety of the ICT tools available in the three departments. Computers, telephones, fax machines, copy machines, printers and mobile phones were among the most common ICT tools being used in all the departments. In terms of the tools not used by the respective Departments differences have been identified, for example in the Department of Social Development tools such as: television, radio, video cameras, video recorders, tape records, sound records, overhead projectors and data projectors are not used,. The reason may be that there are no meetings that include clients that may need tools like radio, television and sound recordings. Also there are no services rendered that require the need for data projectors.

At the Department of Education ICT tools such as the Internet, video recordings, and video cameras are not regularly used for servicing the community, the reason may be because there are no specific services that need such tools in the department. In the Department of Health ICT tools including the Internet, radio, video recorders, video cameras, and laptops are not used for service delivery to their clients.

Of interest, the study determined that these unused tools have been available for quite a while in these departments, yet it is not utilised. Given the fact that such departments exist for providing a valuable service to society, the premise is that every tool available in these departments should be used to enhance service delivery.

Additionally, the study also found that indeed the ICT tools that were utilised improved the services provided to the clientele, for example, in Department of Social Development, computers are used to make applications for grants and to check the status of those applications when the clients are inquiring about them. In the Department of Education department telephones are used to communicate with schools in checking their day to day running and also to communicate with the Head Office. In the case of the Department of Health computers are used to create records for clients who are admitted in hospitals by the department, and telephones are used to check the day to day running of the hospitals and to report problems that may be encountered. In terms of the frequency of the use of these services, the study found that they were used on a daily basis to provided service to the intended clients.

6.2.3 Civil servants interaction with ICTs

The interaction between Civil Servants and ICT tools differs between the departments under study.

According to respondents from the Department of Education computers (18; 86%), the telephone (17; 81%), printers (17; 81%), fax machines (15; 71%), photocopy machines (15; 71%) and mobile phones (11; 52%) were perceived to be the most effective and the tools mostly interacted with. It was indicated by respondents from this Department that South Africa is forging ahead technologically and that government is striving to introduce new technologies to improve both service delivery and the living standards of all the people, However, training in using these technologies was seen as imperative so as to be able to use those technologies effectively so that service delivery can also improve. The greater ease of communication; the eradication of the paper-based system of communication, the speed at which these ICT tools can work as well as the large volumes

of data that can be stored by some of the ICTs have been cited as some of the reasons why they prefer to interact with these ICT tools.

The Department of Health's respondents cited as the most effective ICT tools in the performance of their daily duties as computers, fax, printers and copy machines (7; 78%), intranets, telephones and data projectors (6; 67%); and laptop computers (5; 56%). According to the respondents the main reasons for interacting with ICT tools are that they improve communication and make it easy to get hold of any person using either a mobile phone, telephone, or email. These tools also decrease the amount of work that has to be done manually, for example, there is no need to post letters, because communication is now done in seconds through the use of computers. This in turn improves service delivery as answers can be received faster and information disseminated to the client at their workplace or at home.

Respondents from the Department of Social Development interacted mostly with the following ICT tools: computers, fax and copy machines (18; 100%); printers (17; 94%); and telephones (16; 89%) as these tools gave them the most effective way of servicing their clientele. Respondents from this department indicated that ICT tools should be more freely available in departments for improved service delivery, for example having computers ensures that there is no handwriting of reports, but that it is typed out neatly and stored on file management systems for later referral. Also e-mails are sent to Supervisors and even to head office. Faxing documents are also preferred as it is much easier than mailing, as a faxed document takes minutes to reach its destination as opposed to mail that could take weeks.

All the above mentioned tools are used on daily basis in all the Departments. Computers were especially found to be the most effective and most interacted with tool because of the governments systems, software and information stored on computers that enable the civil servants to utilise them in providing service to the public.

6.2.4 The impact of interaction with ICTs on service delivery.

The study found that the availability and use of ICTs had a huge impact on service delivery. From the results it became clear that those computers are now used for almost everything that is done in the Departments. Telephones are the most common type of communication between Departments and among the civil servants themselves. On a daily basis documents are printed, faxed or photo copied as part of service delivery. This is in line with Souter's (1999) statements on the impact that ICT tools have on the day to day running of an organisations (see section 2.1)

In terms of using laptop technology for service delivery the impact has not yet been significant, but it can be assumed that this technology will become common place in the near future.

6.2.5 Training needs of Civil Servants for the effective ICT utilisation

The training in the use of specific ICTs, especially computers, has been identified by the civil servants in all the Departments as a huge need. In all the departments training in computer literacy and the other available of ICT tools, through workshops and seminars have been identified as of the utmost importance. Training in the proper usage of e-mail services and internet were also identified by all the departments as crucial. Publishing, database searching, file/records management, preparing presentations using PowerPoint, and information retrieval were other areas that the respondents indicated they need training on. As could be seen from the results in chapter 4, lack of training was among the most pertinent reasons why certain ICT tools are not optimally utilised. The apparent lack of training in utilising ICT effectively is supported by the responses by clients from especially the Department of Education which indicated that staff members are seen as not computer literate and unable to deal with clients using computers.

6.2.6 Challenges faced by the Departments in rendering services to the clients or customers in uMhlatuze Municipality

Limited Internet access is seen as a major challenge that hinders easy flow of information and communication within the Departments, among the civil servants themselves and between civil servants and their clients. Some of the civil servants are not office based, meaning that they have to service the communities where they are located, for example mobile clinics. As many of the areas being serviced are geographically remote and void of telecommunications infrastructure for landlines and computer networks it becomes very difficult for civil servants without mobile technology to directly communicate with their respective offices in case they need assistance or any other job related matter. The lack of raining in the usage of most of the ICT tools is a big challenge that civil servants themselves face, rendering many tools that can be used to vastly improve service delivery time useless.

Within each Department specific challenges were identified that hampered effective service delivery, for example, the Department of Education only has very limited work ICT resources such as computers, and the internet. The Department of Health also experienced a lack of resources both in terms of physical space as well as, resources such as computers since the current number of available computers are not enough to accommodate all the work to be done on it. They also experience a critical shortage of professional staff who are computer literate enough to deal with the ever changing technology. Respondents from the Department of Social Development cited the lack of access to the Internet and its associated services such as e-mail as their major challenge since they believe that though the use of emails communication between themselves and with their clients can be improved a lot. IT support is their other challenge because they have a lot of in operate machinery that cannot be fixed in time to be able to support the work load. The lack of mobile phones is another challenge since they are needed when Social Workers are visiting remote areas where there are no landlines to communicate with their offices for assistance.

6.3 Summary

The purpose of this study was to examine the use, effectiveness, and impact of ICTs in the context of service delivery within three government departments operating within the uMhlatuze Municipality.

It was found that some ICT tools such as computers, telephones, fax machines, printers, photocopy machines, and intranets are commonly available, accessible and often utilised by civil servants to render services to the public.

The impact of the interaction with ICTs is both negative and positive. Negative in the sense that it creates problems for those staff members unable to the most commonly used ICTs but also specifically the computer, while it is positive in a sense that for those Civil servants that are ICT literate enough to operate ICT tools their work becomes easier and they can deliver services more effectively.

The government however, still has a lot to do in order to enable all the Departments to utilise ICTs efficiently and effectively in service delivery. Other than providing enough, and the correct ICTs, many training needs were also identified of which government officials should take heed since a lack of skills impedes most opportunities for effective service delivery. This fact was also corroborated by the reaction received from the clients interviewed.

6.4 Recommendations

These recommendations emanate from the results and conclusion of the study. Their adoption should improve the use of Information and Communication Technologies in the context of service delivery specifically in the three departments studied, but also in government departments in general.

6.4.1 More ICT tools for Civil Service

Most governments have engaged themselves broadly in the use of ICT tools to improve their service delivery. All three Departments studied seem not to have access to, and therefore can not utilise important communication or information tools such as E-mails and the Internet for service delivery and/or to do their daily work. ICT tools such as digital cameras, video cameras and recorders, scanners, overhead projectors and databases should be introduced to the Civil Service because many of them can be used profitably for improved service delivery, e.g PowerPoint presentation or TV programmes on health related issues can be created and shown to patients waiting in queues to see the clinic sisters. As it was mentioned by respondents in all the Departments that tools such as computers and laptops were not enough to ensure better service delivery it is recommended that the government departments do an audit of staff needs in terms of ICT tools required and to strive diligently to budget and supply the required tools and the required infrastructure to each department.

6.4.2 Availability and Accessibility to Internet and e-mail services

The Internet and e-mail facilities should be introduced or made available to everybody in the civil service, so that the communication and dissemination of information becomes easier and faster. Of the three Departments studied access to the Internet for service delivery was not available. The same could be said from the e-mail facility. Through Internet e-mail services are made available to users which speeds up communication and provides a cheap medium of communication.

As many government departments are scattered all over the country, some of them in extremely remote areas, access to the Internet and e-mail services, either by way of a computer network or through a mobile phone, becomes very important. Other than allowing inter-departmental communication this facility could also be used to decrease time spent waiting in queues for information by the public, as they could be communicated with without having to be physically present. It is, therefore, recommended that Internet access to all computers and laptops in each department be made mandatory. If a communication network is not available mobile phones providing Internet access should be issued to all staff members for office use.

6.4.3 Training in the utilisation of ICT tools

A lack of skills to operate a number of ICTs, especially the computers has been identified as a serious impediment to effective service delivery. It is, therefore, recommended that the Departments of Education, Health and Social Development should send their staff for training on the efficient utilisation of ICT tools, specifically computer related training. Computer literacy courses and refresher courses should be offered on a continual basis in order to elevate the level of computer literacy among the civil servants. Programmes such as Word processing, Excel and PowerPoint which are used almost daily in the public service should also be continually mounted. When a new staff member has been recruited into a department managers should see to it that those people are given proper training so as to understand the system in place at the time, for example, old staff members should do the so-called “show and tell” session to show new members how things are done within the department. As for new software’s departments should require from private companies who develop programmes to also train the staff so as for them to understand how that program operates. Training can be onsite where staff members are able to develop and assist each other, or if budgets allow, external courses can be attended.

6.5 Suggestions for further research

The study focused on uMhlatuze Municipality alone. It is necessary in future to look at other Municipalities as well to determine how they use or interact with Information and Communication Technologies to improve service delivery.

The study also targeted only three Departments in uMhlatuze Municipality, and it should, therefore, be extended to include all other Departments operating within the Municipal borders. The study can also be extended to cover the whole district Municipality and even go as far as covering the whole province of KwaZulu-Natal.

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APPENDIX 1

Questionnaire

QUESTIONNAIRE FOR THE ACCESS, INTERACTION, USE AND IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES AMONG CIVIL SERVANTS UN UMHLATUZE AREA: A SOCIAL INFORMATICS STUDY.

Dear Respondent

My name is Mduduzi Ntetha, a Masters student registered with the University of Zululand in the Department of Library and Information Science. I am carrying out a study on **“The access, interaction, use and impact of Information and Communication Technologies among the Civil Servants in uMhlatuze area. A Social Informatics study”**

The questionnaire is constructed in such a way that most questions require you to tick the answers. This should take approximately 15 minutes of your time. No names should be provided. You are assured of your rights, including the right of consent, protection from disclosure of information and respect for your privacy. Anonymity and confidentiality are promised and maintained.

Thank you for your cooperation

SECTION ONE: PERSONAL INFORMATION

Please tick the appropriate box when answering the following questions.

1. Please indicate the civil service to which you currently belong (i.e. Department/ministry)

Education ☐ (1)

Health ☐ (2)

Social Development ☐ (3)

2. Please indicate your current job title (e.g. Educator)

.....

3. Highest level of qualification:

Certificate ☐ (1)

Diploma ☐ (2)

Bachelor's degree ☐ (3)

Post-graduate diploma ☐ (4)

Masters degree ☐ (5)

Doctoral degree ☐ (6)

Others, ☐ (7)

Others, please specify.....

4. Gender

Male ☐ (1)

Female

[](2)

5. Please indicate your Management level

Top management [](1)

Middle Management [](2)

Lower Management [](3)

None of the above [](4)

SECTION TWO: ICT ACCESSIBILITY

6. How do you rate the accessibility of ICT tools and services in your organization?

ICT tools and services	1. Accessible	2. Not accessible
Computer i.e. PC		
Laptop computer		
Internet		
Intranets		
Databases (online)		
Telephone		
Mobile phones		
Television		
Radio		
Video cameras		
Video recorders		
Sound/tape recorders		
Overhead projector		
Fax machines		
Digital camera		
Printer		
Scanners		
Data projector		
Diskette		
Copy machines		
Other specify		

Others please specify.....

If they are not accessible, what could be reason for that?

.....
.....
.....

7. Do you have access to a computer? (You may select more than one)

Yes on my desk in my office	
Yes we share in the office	
Yes at home	
Both at home and in the office	
Mobile e.g. lap top	
No	

Other, please specify

.....

8. Do you have access to Internet services? (You may tick more than one)

Yes at my workstation where I assist the public	
Yes on my desk in my office	
Yes we share in the office	
Yes at home	
Both at home and in the office	
Mobile(e.g. lap top computer and mobile phone)	
No	

Other, please specify

.....

SECTION THREE: TYPES OF ICT APPLICATIONS AND SERVICES

9. Which of the following ICT applications and services are available in your institution or organisation for office use or to serve the public?

ICT products and services for office use	Office use	Public service
Computer i.e. PC		
Laptop computer		
Internet		
Intranets		
Databases (online)		
Telephone		
Mobile phones		
Television		
Radio		
Video cameras		
Video recorders		
Sound/tape recorders		
Overhead projector		
Fax machines		
Digital camera		
Printer		
Scanners		
Data projector		
Diskette		
Copy machines		
Other specify		

10. What problems have you encountered in using ICT tools and services? (You may select more than one)

I cannot use the file management facility on the computer	
I cannot use the Windows Operating systems effectively	
I do not have effective keyboarding skills	
I cannot use the word processing facility in the computer.	
I cannot use the computer for accounting purposes using a spreadsheet	
I cannot use databases	

I cannot use the presentations programmes e.g. PowerPoint	
I cannot send an E-mail	
I do not know how to use the Internet	
I do not know how to connect Network into my PC	
I cannot set-up my PC	
I can not maintain my PC	
I can not solve troubleshooting problems	
No ICT support team in the department	
I cannot operate tools such as the video camera	
I cannot operate tools such as data projector	
I cannot operate tools such as scanner	
I cannot operate tools such as printer	

Other please specify.....

11. Which ICT do you use for the following (only indicate ICTs next to those options that you use)

To communicate with friends and relatives	
To collaborate with civil servants	
To communicate with colleagues world-wide	
To disseminate departmental information	
For research purposes	
For education purposes	
For word processing	
For Internet access	
To create/access a spreadsheet	
For records management	
For presentations	
For database searching	
For Information retrieval	
For printing	
To assist the general public	
Others please specify	

SECTION FOUR: THE LEVEL AND RANGE OF USE OR INTERACTION WITH ICTs

12. What is your level of use or Interaction with ICT applications? (You may select more than one)

ICT tools and services	Often	Seldom	Never
Computer i.e. PC			
Laptop computer			
Internet			
Intranets			
Databases (online)			
Telephone			
Mobile phones			
Television			
Radio			
Video cameras			
Video recorders			
Sound/tape recorders			
Overhead projector			
Fax machines			
Digital camera			
Printer			
Scanners			
Data projector			
Diskette			
Management info. Systems			
Information systems			
Decision support systems			
Copy machines			
Other specify			

13. How much time per day do you spend using the following ICTs for office or public service purpose?

ICT tools and services	Less than 1 hour		1-5 hours		6-10 hours		11-15 hours		More than 16 hours		None	
	O	P	O	P	O	P	O	P	O	P	O	P
Computer i.e. PC												
Laptop computer												
Internet												
Intranets												
Databases (online)												
Telephone												
Mobile phones												
Television												
Radio												
Video cameras												
Video recorders												
Sound or tape recorders												
Overhead projector												
Fax machines												
Digital camera												
Printer												
Scanners												
Data projector												
Diskette												
Copy machines												
Other specify												

O=OFFICE

P=PUBLIC

14. How long have you been using the following ICTs?

ICT tools and services	Less than a year	1-2 years	2-5 years	5-10 years	Over 10 years	Not used
Computer i.e. PC						
Laptop computer						
Internet						
Intranets						
Databases (online)						
Telephone						
Mobile phones						
Television						

Radio						
Video cameras						
Video recorders						
Sound or tape recorders						
Overhead projector						
Fax machines						
Digital camera						
Printer						
Scanners						
Data projector						
Diskette						
Management info. Systems						
Information systems						
Decision support systems						
Copy machines						
Other specify						

SECTION FIVE: IMPACT OF ICTs TOOLS AND SERVICES

15. Which of the ICT application or services do you consider effective in your work?

ICT applications & services	1. Very effective	2. Effective	3. Not effective
Computer i.e. PC			
Laptop computer			
Internet			
Intranets			
Databases (online)			
Telephone			
Mobile phones			
Television			
Radio			
Video cameras			
Video recorders			
Sound or tape recorders			
Overhead projector			
Fax machines			
Digital camera			
Printer			
Scanners			

Data projector			
Diskette			
Management info. Systems			
Information systems			
Decision support systems			
Copy machines			
Other specify			

SECTION SIX: TRAINING NEEDS

16. In which ICT applications or areas do you require training? (You may select more than one) and explain what kind of training you need.

	Training	Kind of Training
To use the computer programme used to serve the public efficiently		
Publishing		
Word processing		
Internet access		
Creating spread sheets		
File or records management		
Compiling bibliographies		
Preparing presentations using PowerPoint		
Database searching		
Information retrieval		
E-mailing		
To use the fax machine efficiently		
To use the copying machine efficiently		
Delivery presentations		
Others please specify		

17. Please suggest solutions that can solve those problems.

(i).....

(ii).....

18. What would you propose as recommendations in improving the applications and use of ICTs in your institution or organisation?

(i).....

(ii).....

(iii).....

19. How do you think ICTs have changed the way in which you do your work or communicate with colleagues or the public? Please provide as much detail as you can and as many examples as you can

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20. Explain how has the Internet changed or helped your Department in servicing the public? Does your Department have website?

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**THANK YOU VERY MUCH FOR PARTICIPATING AND COMPLETING THE
QUESTIONNAIRE**

APPENDIX 2

Interview Schedule for Civil Servants in the Departments

Interview Schedule for Civil Servants in the Departments: Education, Health and Social Welfare in uMhlatuze Municipality.

1. What service/s do you deliver to the public?

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2. What is the level of satisfaction of the public with your service delivery?

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3. Do you use any computers to provide services? If yes, when did you start using the computers and what has been the impact?

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4. What is the attitude of staff towards the use of computers? Do they have skills to use the computers?

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5. What are the challenges you face in your service delivery?

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6. How do you think computers could be used to improve the services?

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Thank you for your time.

APPENDIX 3

Interview Schedule for Clients in the Departments

Interview Schedule for Clients and Customers in the Departments: Education, Health and Social Welfare in uMhlatuze Municipality.

1. What service have you come here for?

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2. How often do you come to seek service from this Office?

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3. Are you satisfied with the service you are provided with? If not, what problem/s do you face when you come to seek service from this Office?

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

4. How do you think service can be improved?

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5. Do you have access to ICT at home? If yes, what ICT do you have?

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6. Do you think that some of the services provided here can be provided to you at home? If yes, what are they?

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Thank you for your time.