INFORMATION SHARING IN GOVERNMENT DEPARTMENTS: A NAMIBIAN CASE STUDY

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INFORMATION SHARING IN GOVERNMENT DEPARTMENTS: A NAMIBIAN CASE STUDY

by

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Thesis submitted in fulfilment of the requirements for the degree

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in the Faculty of Informatics and Design

at the Cape Peninsula University of Technology

Supervisor: Mr. Ephias Ruhode
Co-supervisor: Prof. Retha de la Harpe

Cape Town
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DECLARATION

I, Suama Lineekela Naveuye Hamunyela, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

This study explores information sharing in government departments from a developing country's perspective. Efforts to understand the relationship between information sharing as a concept and the e-government(s) phenomenon are made and discussed. Literature reviewed in this study indicates that information sharing is a core component of the e-administration part of e-government. E-government initiatives are intended to enable information sharing between and within government departments. ICT initiatives under the e-government umbrella facilitate information sharing within government departments. However, such initiatives fail to or do not achieve their intended objectives due to technological, organisational, environmental and people related limitations. The process to overcome such barriers can begin by analysing activities focusing on information sharing processes as a means of identifying needs for improvement. There is a need to discuss work activities, actors, aims of activities and the role of Information and Communication Technologies (ICTs) in government departments, in order to identify information sharing needs and make possible recommendations for effective information sharing processes.

A conceptual model is recommended to improve information sharing in government departments, and it has shown promise when applied to a selected work activity in this study. The results of the work activity case study show that technology, organization, environmental and people related factors indeed exist in the government's department and can have both a positive and a negative influence on information sharing between the three governing levels of the Namibian government.

A pair of recommendations is given in this study. Firstly, a technology-organisational-environmental-people framework is recommended to government departments for effective information sharing. Secondly, recommendations are given to facilitate the information sharing needs of the Child Allowance (CA) department in the Ministry of Gender Equality and Child Welfare (MGECW). Limitations of the study and opportunities for further research that have been identified are stated at the end of this study.

Key words: Activity Driven Needs Analysis, e-government, Information sharing, ICT, Technology-Organization-Environment, Namibia.

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DEDICATION

To my mother, Ndesheetelwa Ndahafa Kamati

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GLOSSARY

Abbreviations	Definition
ICT	Information and Communication Technology
OVC	Orphans and Vulnerable Children
MGECW	Ministry of Gender Equality and Child Welfare
CA	Child Allowance
DPSITM	Department of Public Service Information Technology Management
UN	United Nations
SADC	South African Development Community
BoN	Bank of Namibia
MD	Millennium Development
GDP	Gross Domestic Product
IFMS	Information Finance Management System
HRIMS	Human Resources Information Management System
TOEP	Technology-Organization-Environment-People
SWGS	Social Welfare Grant System
CCW	Child Community Worker
ADNA	Activity Driven Needs Analysis
TOE	Technology Organization Environment

CHAPTER ONE
GENERAL INTRODUCTION

1.1 Introduction

Most organizations' acts to achieve business objectives depend on information sharing. Therefore, organizations strive to achieve effective and efficient information sharing processes. In some cases, this can only be realized through implementing and exploiting the information and communication technologies (ICT) in operations of the information society members, such as government initiatives, to accelerate administration processes. Implementing and exploiting of ICTs entails information sharing needs analysis.

According to Lee et al. (2005: 99) the pervasive adoption of the internet since the 1990s has stimulated businesses to embrace e-commerce, leading to improving information sharing in organizations. Lee *et al.,* (2005: 99) further explains that in the public sector, e-government has emerged and grown enormously after the pervasive adoption of the internet. The main objective of e-government is to provide efficient and convenient access to information and services to government stakeholders. However, provision of timely access to government services requires streamlined and coordinated processes. Therefore, governments implement e-government initiatives to achieve timely access to information and government services as well as to streamline and coordinate processes. In order for public organisations to deliver government information and services, sequences of activities are carried out, decisions taken, and conformity attained by sharing information between departments. The term information sharing is often interchanged with information exchange. Information exchange is an informal term that can either refer to bi-directional information dissemination or information transfer in telecommunications and computer science or communication seen from a system-theoretic or information-theoretic point of view. Therefore, information sharing is conceptualised as stated above.

With these views on information sharing in mind, this thesis was designed. It is the outcome of a study which aimed to explore information sharing in government departments, focusing on information sharing needs and ICT use. The case studied in this thesis is a government department at different administrative levels (national, regional and constituency levels). It was focused on a work activity that entailed registration for Orphans and Vulnerable Children (OVC) from the department of CA of the Ministry of Gender Equality and Child Welfare (MGECW), Namibia. The thesis is structured in chapters. In this chapter, the research problem, underlying questions and objectives are stated. The terms Information sharing, e-government, and ICT are defined. Lastly, a summary of the remaining chapters is provided.

1.2 Background to the research

This section gives an overview of Namibia and discusses the background information relating to ICT penetration and ICT initiatives in the public sector.

1.2.1 Namibia: the empirical setting

Namibia is a member state of the South African Development Community (SADC) and the United Nations (UN), with an estimated population of 2 million (World Bank, 2008). The country of 824,292 square kilometres is divided into thirteen (13) administrative regions with Omusati region being the most populous region. Administrative regions are subdivided into electoral constituencies. The number and size of each constituency varies with the size and population of each region (UNDP, 2009). There are currently 107 constituencies in Namibia. The most populous constituency is Walvis Bay Urban in the Erongo region and the least populous is Walvis Bay Rural (UNDP, 2009). The administrative divisions of Namibia were tabled by Delimitation Commissions (a committee that deals with regional and constituency boundaries in Namibia) and were accepted by the National Assembly. Regional councillors are elected through secret ballots (regional elections) by the inhabitants in their respective constituencies (UNDP, 2009).

All the head offices of the government ministries are located in the capital city – Windhoek. The country has a decentralization policy which hands down the execution of services to regional level and constituency level. To implement decentralization policy, ministries have regional and constituency offices. Driven by the Millennium Declaration (MD) and the declaration of the principles of the information society and its action plan, an ICT policy was developed and implemented by the office of the Prime Minister in 2005 (Namibia OPM, 2010). The policy strives to simplify administration, service delivery and interaction between stakeholders by using electronic means to improve services and ensure that economic, political and administrative authorities are appropriately supported to better manage affairs of the country at all levels; national and local (Namibia OPM, 2005: 14).

According to the UNDP e-standard forum report (2009), Namibia is ranked 129 of the 179 countries and territories in the UNDP Human Development Index. The per capita income is deceptively high at $4,135, but there is widespread poverty with 55.8% of the population living on less than $2 a day and 24% of the population undernourished. As a result of a high-infection rate for HIV/AIDS, the life expectancy is 51.2 years. The number of orphans and vulnerable children has escalated in Namibia. In 2008 the Ministry of Gender reported an estimated 250,000 orphaned and vulnerable children (155 000 due to AIDS) (Namibia

MGECW, 2008). For children whose families cannot care for them, an alternative source of care is foster care (Namibia MGECW, 2010). An estimated 14,000 children were in foster care as of February 2009 (Namibia MGECW, 2010). Maintenance grants are another source of income for OVCs. The literacy rate in Namibia is 88.0%. Namibia has the following tertiary institutions; the University of Namibia and the Polytechnic of Namibia, three teacher training college institutions and three vocational institutions. Furthermore, Namibia has a highly developed banking sector with modern infrastructure, such as Online Banking and Cell phone banking. In Namibia the Bank of Namibia (BoN) is also the central bank of the country, in that it is responsible for performing all the functions ordinarily performed by a central bank in other countries.

1.2.2 ICT penetration in Namibia

According to the World Bank report (2008) the country's Gross Domestic Product (GDP) estimate is US$ 5.6 billion per annum. This report focuses on ICT by using several indicators. The table below shows ICT penetration in the country according to these ICT related indicators at a glance.

Table: 1.1 ICT penetrations in Namibia – Source: MICT, 2011

Indicator	Estimation (% or number)
Population	About 2.18 million.
Computer penetration	14.7 % of Households (*Research ICT Africa/ ITU: 2011)*
Fixed telephone lines	158,499 *(Telecom Namibia 2011)*
Internet users	13.4% of Population *(Research ICT Africa/ ITU: 2011)*
Mobile users	56.1 % of Population *(Research ICT Africa/ ITU: 2011)*
Electricity	45.5% of Households (Universal Service Baseline Study 2011)

The table above indicates that the country's ICT accessibility significantly increased between 2005 and 2008. Access to mobile cellular subscriptions has also improved tremendously in Namibia between 2005 and 2008. Namibian's telecommunication services are provided in a monopolistic operation through an enterprise called Telecom Namibia while mobile services are provided by Mobile Telecommunications (MTC) Namibia and Leo Ltd.

1.2.3 ICT initiatives in the Namibian public sector

To better understand ICT in Namibia, the ICT infrastructure and ICT initiatives relevant to this study are described here. In addition, this section highlights some of the e-government projects in Namibia. Over the past five years, the Namibian government, with assistance from donors and with partnerships with development partners, has invested in the upgrading of the ICT infrastructure of the public sector. The accomplished ICT projects include two integrated information systems, the Information Finance Management System (IFMS) and Human Resources Integrated Management System (HRIMS). One of the aims of the initiative is "online dissemination of information to government officials, mostly Personnel Officers, or through Personnel Offices. Human resources management information mostly focuses on the conditions of employment and service benefits. The conditions of employment include: appointments, probation, transfer, and promotion, termination of service, service benefits, daily subsistence allowance, and use of official transport, misconduct, grievances, social security benefits and union membership" (Kakololo,2007).

The Department of Public Service Information Technology Management (DPSITM) has developed an e-government policy which focuses on enhancing service delivery, reducing the cost of service delivery and improving efficiency by automating most of the services (Namibia OPM, 2005: 4-5). The ICT policy aims to support and simplify work and processes, service delivery and interaction between different stakeholders (including M/O/A), as well as to provide guidelines for an over-arching framework that allows provision of speedy, transparent, accountable, efficient and effective processes for performing government administration activities (Namibia OPM, 2005: 14).

In addition to the policy, the government has embarked on a revamping of the ICT infrastructure in O/M/A (OPM, 2010). The upgrading of the Government's ICT infrastructure aimed at improving network bandwidth and security in order to provide fast and secure access to Government services. An upgraded ICT infrastructure (hardware and software) has created an enabling environment for the implementation of e-governance initiatives (OPM, 2010). Figure 1.1 shows the upgraded GRN network framework. Each ministry has a router linking it to the Internet Gateway Router which resides at the OPM server office.

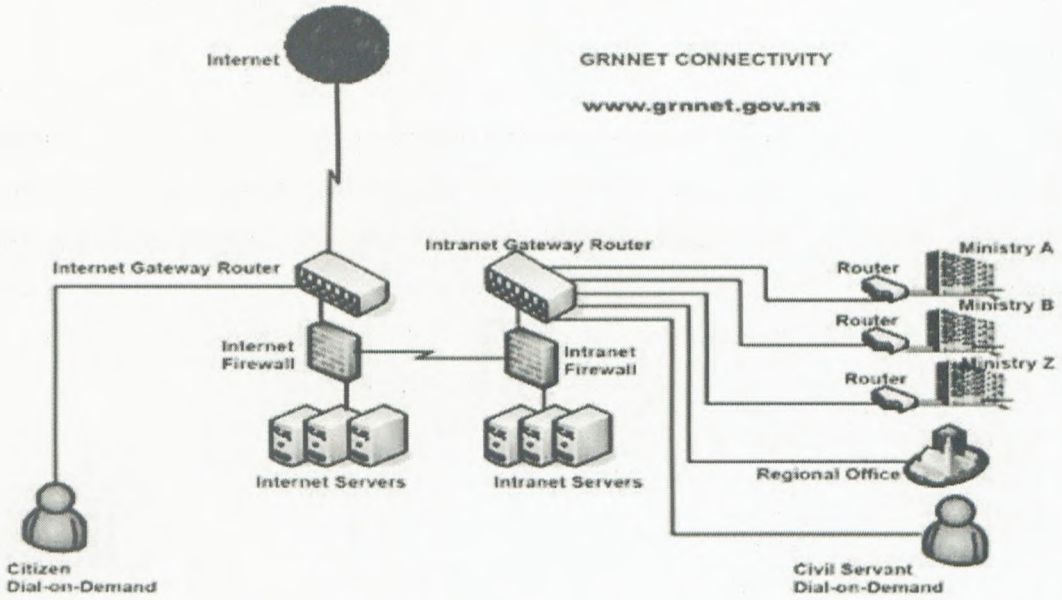


Figure 1.1: GRN network infrastructure design – Source: OPM 2010

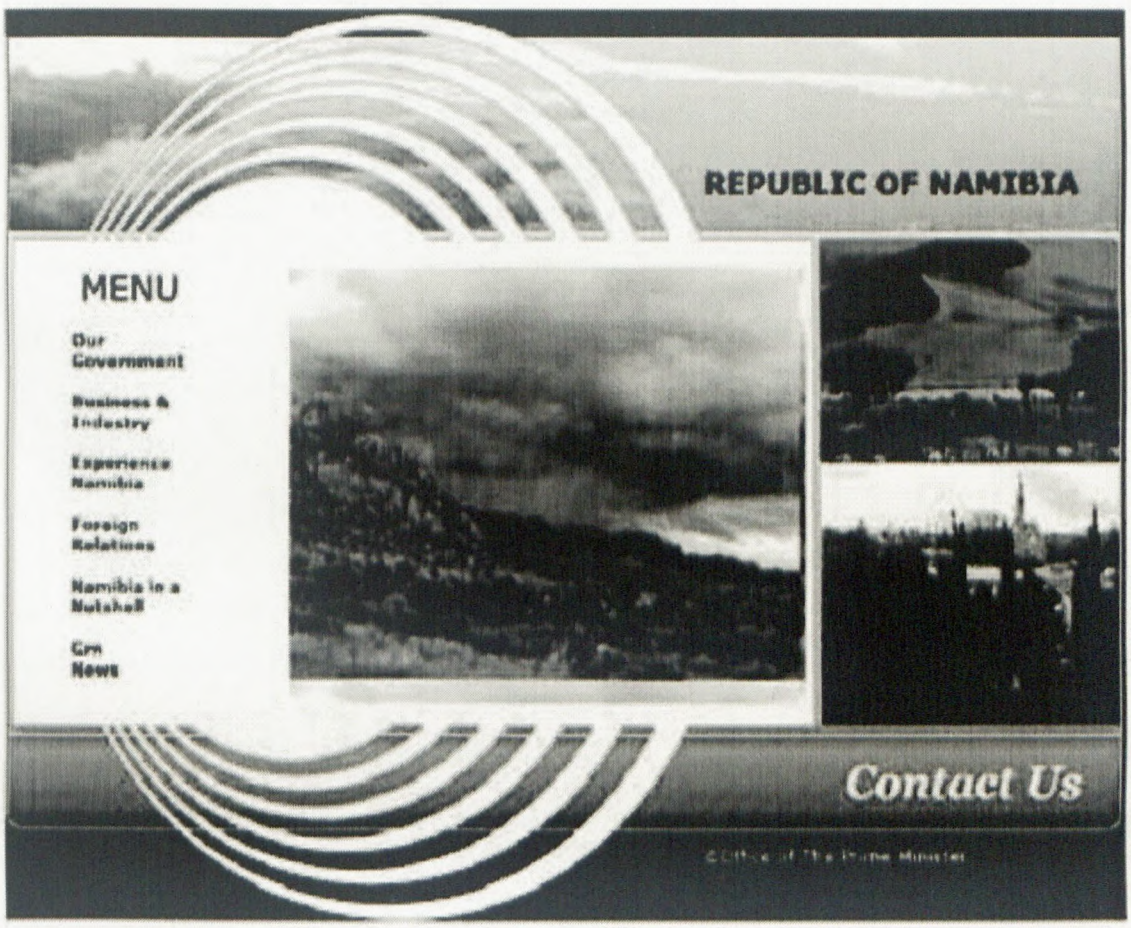


Figure 1.2: GRN Net Portal Screenshot. Source: GRN.net, 2010

Furthermore, a government information portal project (figure 1.2) was completed in the 2008/9 financial year. The purpose of this project is "to facilitate the consumer's transition from being 'in-line' to being 'online' by providing a single point of access to information and services organized according to the interests and needs of its consumers, permitting access at any time and any place" (OPM GRN net, 2010).

The portal serves as a central location where users can obtain information and service via different links of the portal. The main links like 'our government' contain general information, such as Namibia's infrastructure (airport and services, railway and telecommunication infrastructure), banking sector, human habitation and others. Through the portal, government stakeholders have access to policies such as the e-government policy, privacy policy, and the Namibia online directory, among others.

1.3 Problem statement establishment

Information sharing needs for government departments remain uncertain. The extent of ICT use and the effectiveness of sharing information processes within government departments at different administrative levels, to indicate the level of information sharing needs, remains unknown. The problem arises from departments of the Namibian government. Information-sharing processes are assumed to be taking place to achieve effective and efficient decision making and service delivery. Regardless of the e-government policy implemented by the government through the Department of Public Service Information Technology Management (DPSITM), it is not established how information is shared between constituency offices, regional offices and the Head Office, where decisions are taken. This includes clarification on the present ICT tools used to convey information from the constituency and regional offices to the Head Office, and vice versa. The aim of this study is to investigate how information is shared in government departments at different government levels, and to establish what ICTs are used in information sharing processes. The focus is to study existing information sharing architecture and suggest improvements to this. The following section presents the research question, sub-questions and the objectives of the study.

1.4 Research question, sub-questions and objectives of the study

It is necessary to consider how information is shared within government departments, to establish factors influencing information sharing effectiveness and to look at the employment of ICTs in the process of information exchange within departments. In order to achieve the aim of the study, objectives were formulated. The research question was designed to provide

direction for empirical data gathering and analysis. To obtain detailed information, the question was broken down into manageable sub-questions, in order to conduct interviews.

Table 1.2 Research Question, sub-questions and objectives

Research problem: Information sharing needs for government departments are uncertain. It is not clear what influences information sharing between government departments.		
Research question: What are the information sharing considerations for government departments?		
Research sub-question	**Research method**	**Objectives**
1. What are the information considerations of service provision by the CA department?	Observation and interviews	Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government, specifically the CA department.
2. How is information shared between departments in government?	Literature review	
3. What are the purposes of sharing information within departments?	Interviews and literature review	Establish what information is shared and for what reason. Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government.
4. What contexts influence the sharing of information in government departments?	Literature review	Identify information sharing influential factors in government departments.
5. How can information sharing in government departments be improved?	Analysis of Q1, Q2,Q3,Q4 and Q5	Recommend viable dimensions for information sharing improvement.

1.5 Definition of key concepts of the thesis

The terms discussed in this section are considered vital to the thesis. Information sharing, ICT and e-government are defined in this section and referred to in other chapters.

1.5.1 Information sharing

Government information sharing is the capability of government agencies to acquire process and apply information in common with others (Estevez *et al.*, n.d). In the World Book dictionary (A-K, p. 1084), information is described as knowledge/facts/data given or received of some fact or circumstance. As stated previously, the term information sharing is often used interchangeably with information exchange. Information exchange is an informal term. As conceptualised earlier, the term can either refer to bi-directional information transmission/information transfer in telecommunications and computer science or communication seen from a system-theoretic or information-theoretic point of view. Information referred to in this thesis includes data. Data is defined as an idea known or granted, information or facts (World Book dictionary A-K, p. 527). Literature on information sharing in the public sector at national levels has proliferated in the past decades. However, literature targeting administrative processes and service delivery information sharing in the field of e-government has not been so prolific. In this thesis, two ways of information sharing are referred to: intra-government information sharing (sharing within a department), and inter-governmental information sharing (sharing between departments). The term information sharing is applicable in this thesis, when referring to the sharing of data and information between users within the same department but at different locations.

1.5.2 Information and Communication Technologies (ICTs)

The definition of ICT by scholars and researchers is subjective. Different scholars have different opinions on what to include and not to include in the definitions of ICT (Tempo, 2008). ICT is an umbrella term that includes any communication device or software, including radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning (ICT4D, 2011). This study adopts the definition given by ICT4D.

ICT supports the acquisition, storing, accessing and manipulation of data, information and services. The growth of ICT in private sectors has caused enormous impact on the daily operation of many organizations, leading to the espousal of e-government in public sectors. Hans (2003) state that "ICT enables business processes to change". Equally,

Themistocleous & Sarikas (2005: 508) express that "ICTs are useful instruments, capable of achieving quantum leaps in the field of enabling governments to enhance and possibly transform relations with citizens, businesses and agencies as well as other governments".

1.5.3 e-Government

e-Government is known as 'digital government' or 'on-line government' (Nanping & Yuan, 2008: 476). Numerous descriptions of e-government emerge in the literature and text books. Palvia *et al.*, (n.d) refers to the pacific council work group and the AOEM definitions of e-government specifying that, e-government is "the use of ICT to promote more efficient and effective government, facilitate more accessible government services, allow greater public access to information, and make government more accountable to citizens" in developing countries. The World Bank (www.worldbank.org) refers to e-government as "the use by government agencies of information technologies (such as Wide Area Networks (WAN), the internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and / or cost reductions".

Hans (2003) expresses the opinion that many of the evolved definitions of e-government emphasize the capabilities of e-government to re-orientate relations between governments and stakeholders, administrative efficiency, and cost savings or on timely services availability. ICT4D (2011) indicates that, e-government is "the use of information technology to arrange delivery of public services to citizen, business partners, and those working in the public sector". In agreement with ICT4D, Nanping & Yuan (2008: 476) state that e-government, refers to "the use of internet technology as a platform for exchanging information and providing services for and transactions with citizens, business, and other sector of the government". However, Heeks (2008: 4) states that e-government is the use of IT by public sector organisations and not just about internet use but all other IT tools. It is therefore evident from all these description of e-government, that, internet use is fundamental.

For this study, e-government is considered to be the utilization of ICT in government processes, to enable the revitalisation and propagation of government information and services to internal government stakeholders (departments). This study explores information sharing under the e-government umbrella.

According to the UN (2008) e-government can contribute significantly to the process of transformation of a government, by making it short, and more cost effective. E-government can also facilitate communication and improve the coordination of authorities at different tiers of government, and within the organisation's departmental levels. Furthermore, e-government can enhance the speed and efficiency of operations by streamlining processes, improving research capabilities and improving documentation and record keeping (UN, 2008). "E-government is an evolving multidimensional and multidisciplinary field, where many mutually interdependent factors impact its success, acceptance and perceived benefits" (Themistocleous & Sarikas, 2005: 510).

1.6 Thesis chapters

This thesis is organised as follows:

Chapter one: This introduces the research topic and the thesis content.

Chapter two: Literature review. In the second chapter, discussions from the literature on e-government and information sharing are presented. Benefits of intra and inter-governmental agency information sharing are discussed. Lastly, factors influencing information sharing in governments that emerged from the literature are summarized.

Chapter three: Underpinning theory. In the third chapter, theories applied to similar studies are discussed. The rationale for not selecting all but one theory as an underpinning theory is stated. The chosen underpinning theory is then explained and the rationale is given. Lastly, the derived model for information sharing efficacy is presented and discussed.

Chapter four: Research design and methodology. The research methodology, methods and design are stated and discussed in this chapter. The case study is described here.

Chapter five: Research findings. This chapter focuses on the findings and interpretation of the empirical data gathered. Information-sharing processes are outlined and technological needs are identified.

Chapter six: Conclusions and recommendations. Here conclusions on the research findings are summarised and recommendations on identified information sharing needs are given. Lastly, limitations of this study and areas for further study are outlined.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

In chapter one, the problem statement and objectives of the study are stated. The background information on the ICT in Namibia is presented. This section includes detailed analysis of e-government, which outlines the relationship between e-government and information sharing. Earlier stated facts lead to discussion on information sharing initiatives in governments, perceived benefits and impediments to intra-, and inter-governmental information sharing. From discussions, information sharing needs and values are uncovered pointing out why governments engage in the phenomenon and the need for effectiveness of information sharing. The intra-governmental and intergovernmental terms adopted in this study are from Caffrey (1998) and defined as follows: Intra-governmental refers to sharing of information between departments, agencies and ministries at the national level while intergovernmental refers to sharing of information between government levels; state, province or local levels of government (Caffrey, 1998). As stated in chapter one, this study focuses on intra-governmental information sharing.

2.2 E-government scope

To some researcher's e-government is a broad concept referring to the use of ICTs to maintain and improve government functions and services, to link government and citizens (G2C), government and businesses (G2B), government and government (G2G). As mentioned in chapter one, e-government involves the use of internet technology as a platform for exchanging information and as a means of providing services and of making transactions with citizens, business, and other sections of government (Nanping & Yuan, 2008: 476). The stance adopted in this study is that, e-government is the utilization of ICT in government processes enabling revitalisation and propagation of government information and services to government stakeholders. E-government specifically includes the following:

- Providing good reliable access to government information.
- Promoting civic engagement by enabling the public to interact with government officials.
- To make government operations transparent (InfoDev, 2002).

The literature shows that e-government promotes activity resolution and services in governments, as is experienced in organizations applying IT (Ebrahim & Irani, 2005; Heeks, 2001; Heeks, 2006; UN, 2008; Ochara, 2009). According to Heeks (2006: 6) e-government consists of eServices, eAdministration and eSociety. Figure 2.1 below, adopted from Heeks

(2006: 6), and depicts e-government components as discussed above. The diagram is an expansion of Heeks's (2001) e-government domains.

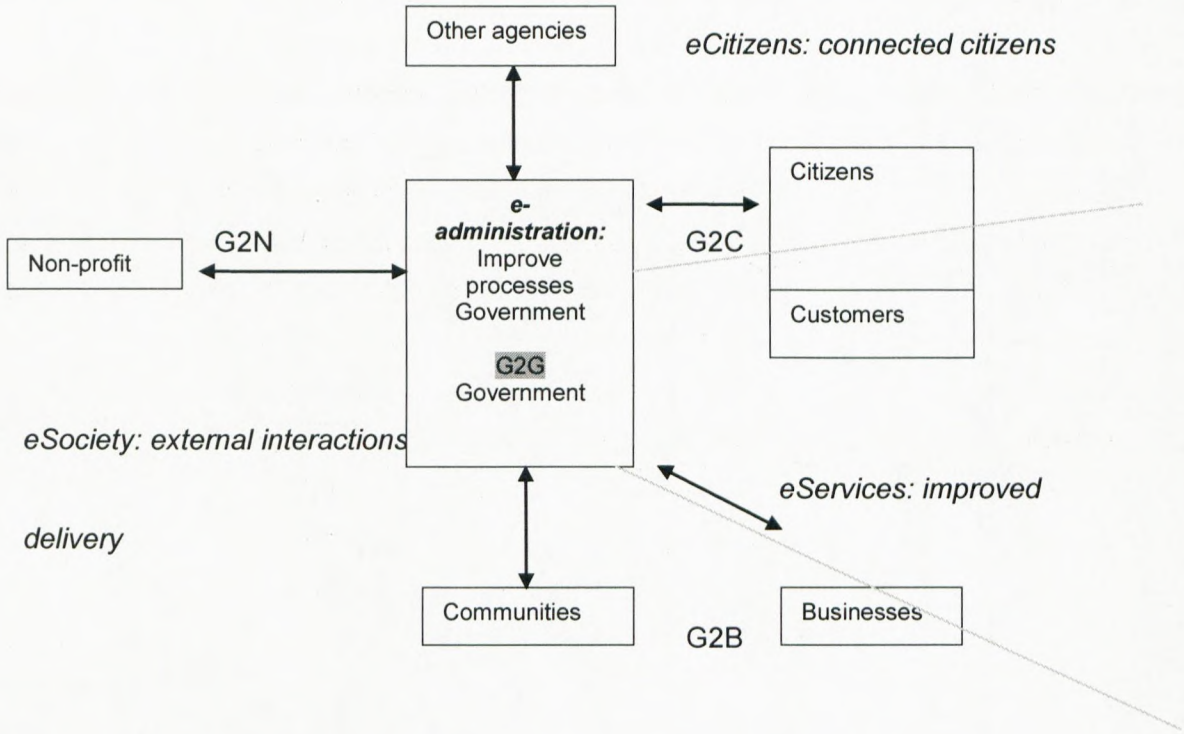


Figure 2.1 the components of e-government. Source Heeks: 2006.

Heeks (2006: 6) unpacks and expands the earlier suggestion of e-government focal domains from Heeks (2001), adding improved eServices to businesses. The objectives of e-government components are summarized as follows:

• G2C: The government aims at connecting government and citizens through eCitizens initiatives.

• G2B: The government provides improved service delivery to businesses and customers through eServices initiatives such as online company registration and tax compliance.

• G2N: The Government's objective is to increase interaction between governmental and non-governmental agencies, communities and other agencies. E-government initiatives are promoted to create an eSociety.

• G2G: refers to improved administration via e-government initiatives targeting efficient and effective approach to government information within the government. G2G initiatives aim to renew government processes by automating administrative tasks and by connecting the internal processes and functions of departments (Heeks, 2001). Efficient information sharing is one of the G2G targets through e-government. Governments are hard at work to refurbish the G2G sector in order to obtain information sharing benefits; Beynon-Davis (2007) articulates that G2G is the key issue for e-government. This writer is referring to both inter

and intra-government agency sharing through integrated information systems (or back offices as some researchers would prefer) that will lead to the achievement of the e-government purposes and objectives.

Meanwhile it must be remembered that, governments are divided into administrative levels. These levels differ from government to government, according to where they are based, and centred according to administrative demarcations. The existence of government departments at different administrative levels calls for departments to share information, to enable coordination of activities and consolidated information for decision making and planning purposes. ICTs are pertinent to all governing levels to provide linkage between departments. Heeks (2006: 9) points out five possible levels of governing where e-government is assumed to be taking place.

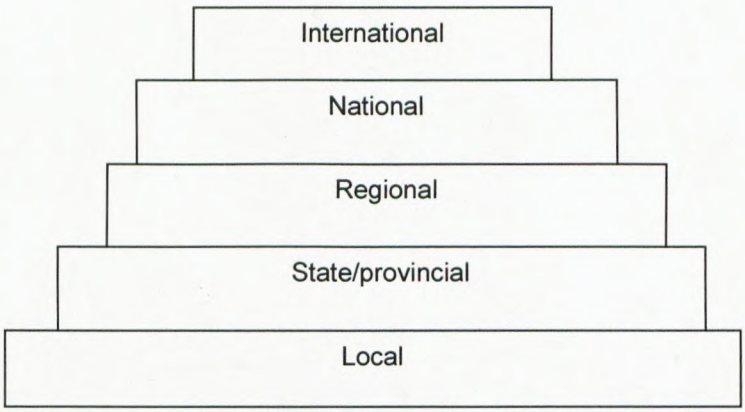


Figure 2.2 Levels of e-government. Source: Heeks, 2006

The Namibian government has four levels of administration namely: constituency level representing the local level, the regional, national and the inter-national levels. Government levels refer to geographical coverage of reach. Some governments can have all levels presented in Figure 2.2. This study focuses on G2G information sharing between the three (lower/middle/upper) levels of the Namibian government. However, e-government is also characterised of stages. Stages refer to the e-government development level in terms of functionalities, richness and diversities of services. The stages are summarized as follows (UN, 2008).

Stage I: is the emerging stage, where governments focus on their online presence which comprises of web pages and an official website. Much of the information is static, and there is little interaction with government stakeholders. Stage one of e-government offers read only opportunity to citizens and those seeking information about government services.

Stage II: is an enhanced stage, where government focuses on providing more information on public policy and governance. This enhanced stage is characterized by links that offer opportunities to download information such as reports, forms, policy statements, newsletters etc.

Stage III: portals and websites now allow the government to interact with stakeholders through online services. Government web-portals have emerged as a key priority for public sector organizations as they develop their e-government initiatives and promote electronic interaction between G2C, G2B, government and its employees (G-to-E), and G2G (Ebrahim & Irani, 2005). The integration of portals offers a choice of government departments that are able to complete transactions between citizens, businesses and between government agencies and departments at different level of governing (Ebrahim & Irani, 2005).

Stage IV: governments transform themselves by introducing two way interactions between citizens and the government. This transactional stage includes options for paying taxes, applying for ID cards, birth certificates and other similar G2C interactions. All services are available online on a 24/7 basis at this stage (UN, 2008).

Stage V: the notion of connected government is introduced. eAdministration is the centre of attention at this stage. Connected government is characterized by a horizontal connection (connection among government agencies), connected central and local government agencies, interoperability issues, connections between governments and citizens and connection among stakeholders such as non-governmental agencies and academic institutions (UN, 2008).

eGovernment stages are characterized by the upgrading of IT infrastructures, internet connections and integrated information systems to facilitate information sharing between government agencies. The UN (2008) points out further that as a government move upward to the level of connected government, it passes through many thresholds in terms of infrastructure development, content delivery, business re-engineering data management, security issues, and customer management. A connected government benefits in different ways, internally and externally (as elaborated in section2.7). Figure 2.3 adopted from the UN (2008) e-readiness report indicates an ICT enabled (a connected) government internal and external benefits to the public agencies.

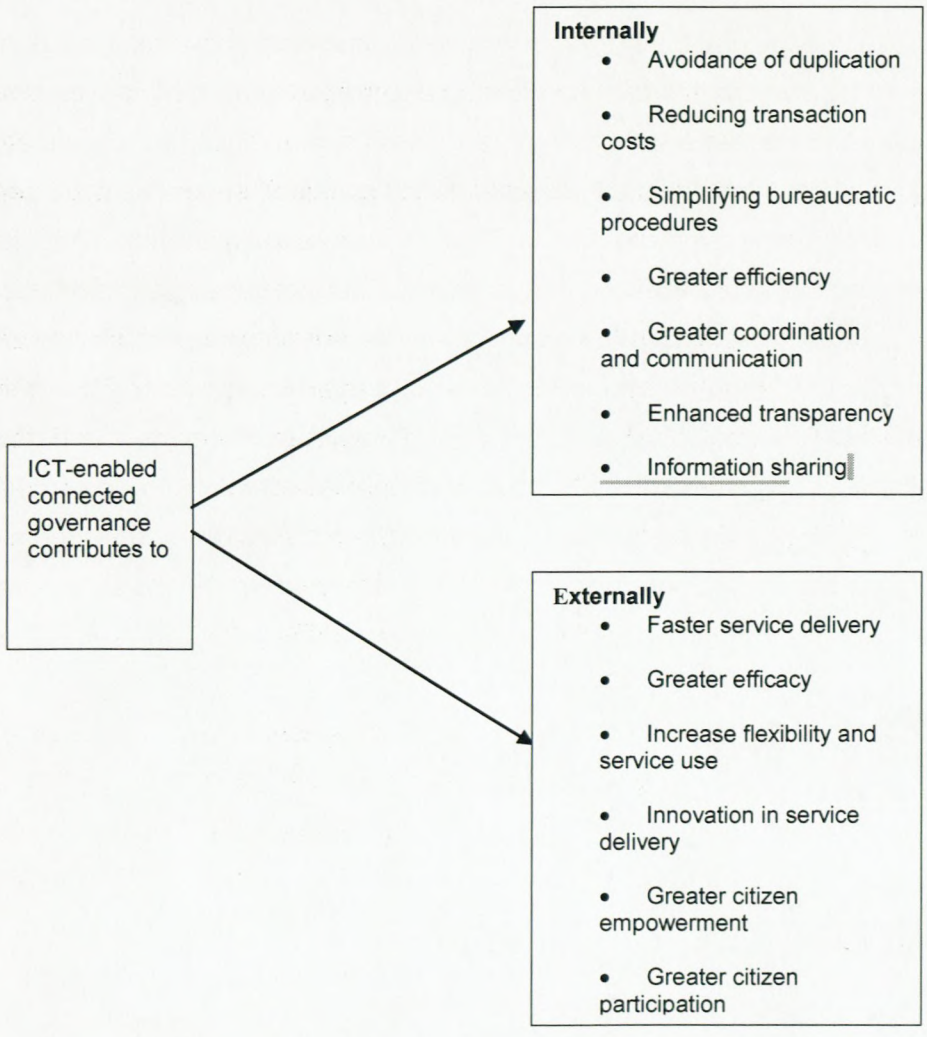


Figure 2.3 ICT enabled connected government contributions. Source: UN, 2008

Since developing countries are struggling with the initial stages of e-government, it can be argued that, for developing countries a comprehensive e-government is not a dream that can be achieved any time soon. A lot of issues need to be addressed before embarking on a journey or programme to achieve a connected government. For example, ICT adoption and infrastructure, skills development etc.

As stated earlier, this study focuses on exploring information sharing needs within government departments. This study investigates what ICTs are adopted and used to share information within departments. It also looks for appropriate recommendations to bring about efficient information sharing between departments, as stated in chapter one. ICT related barriers that have to be dealt with before it is possible to fully achieve e-government in developing countries, are discussed.

2.3 ICT information sharing initiatives

As described in chapter one, ICT is a mixture of IT and communication tools considered useful instruments capable of enabling the government to achieve quantifiable benefits that lead to the enhancement and transformation of government processes (Themistocleous & Sarikas, 2005: 508). The literature reports that governments take up ICT initiatives to improve information sharing between agencies (Heeks 2002; Chiang & Hsieh, 2007; Gichoya, 2005; UN, 2008). Many items of literature focusing on enabling information sharing are reviewed (Nanping & Yuan, 2008; Watson, 2000; Dawes, 2009; Chrysanthis *et al.,* 2002; Ardissono *et al.,* 2009; Chiang & Hsieh, 2007). From the reviewed literature, it is found that IS such as EDI, ERP, EAI, PSKN is utilized to facilitate information sharing. Increased IS development is a significant approach to data and information management in government agencies. IS are defined as organized combination of people, hardware, software, communications networks, data resources and policies and procedures that stores, retrieves, transforms and disseminates information (O'Brien & Markas, 2005). Mursu *et al.,* (2007) define IS as the use of information technology in a collective work activity, either as a means of work or of coordination and communication. Inter-organizational information system (IOIS) for instance, supports information sharing between two or more organizations (O'brien & Markas, 2005). With IOIS, resources are shared to the benefit of all participating agencies. With the advancement of e-government and government administration divided into different levels, IOIS can be used to share information across government agencies. Inter-organizational systems (IOIS) are defined as information and communication technology-based systems that extend beyond an organization's legal boundaries (Street & Goldsmith, 2004).

The PSKN (Public Service Knowledge Network) is an example of IS. According to Dawes (2009), public agencies develop networks of IS to share data and information. An example of integrated systems to form a network of systems is the PSKN of New York. Dawes et al (2009) describe the network efforts to share geospatial information and expertise, such as the National Spatial Data Infrastructure initiative in the U.S. federal government; networks to support the sharing of public health data, such as the BioSense system supported by the Centres for Disease Control and Prevention and the U.S. Department of Health and Human Services; and networks to share environmental data, such as the Environmental Protection Agency's AirNow program. The PSKN constitutes communication channels that give participants access to others' information and knowledge, with the expectation that better quality, timely, and complete information will be available to those who need it at the time that it is most useful (Dawes, 2009).

The Namibian government through the office of the Prime Minister upgraded all ministries routers and firewalls. The improved network infrastructure allows integrated systems to function better than previously. Other initiatives such as the IFMS (Integrated Financial Management System) are successfully implemented and useful to government ministries. IFMS allows ministries to share resources of hardware and applications in financial daily activities. Another notable functional system is the HIRMS, which integrates ministries [that need] to accomplish human resources activity. An important module in this system is the connection to the public service commission which does the planning and staffing of all government departments. The module enables the public service commission to identify positions, both occupied and vacant, and to plan efficiently for staffing organization (Namibia-OPM: 2011). From the literature, innovations required to enable information sharing in government are: IS, Internet, emails, dynamic website, portals, information management systems and shared databases, electronic white boards, and communication networks.

2.4 Information sharing needs in e-governments

In many countries, the use of the e-government systems is increasing, not only in investment but also in terms of high visibility with a number of high-profile initiatives (Gichoya, 2005). For example, as stated in the previous section, in Namibia the government introduced Information Finance Management Systems (IFMS) to provide efficient fiscal management to all government departments. In the context of e-government and information sharing, ICT initiatives such as information systems are required to enable information sharing. According to Ebrahim & Irin (2005: 594), e-government information sharing depends to a significant degree on existing government data and existing processes. Therefore, governments integrate information systems and web application to share information within and between departments. Similarly, information sharing depends on existing data management which can be achieved through ICT implementation and use.

From the literature, information sharing is facilitated by IS. Government departments need IS to be able to share information. Researchers concur that ICTs are useful instruments, capable of achieving quantum leaps of benefits including information sharing benefits (Heeks, 2008; Gichoya, 2005; UN, 2008; OPM, 2005).

The internet is a sought-after ICT tool, which enables networks of computers to share information and related groups to collaborate. Ebrahim & Irani (2005: 590) applaud the presence of the Internet in the e-government adoption process by stating that "e-government provides a wide variety of information to government agencies, citizens and businesses through the Internet". The formation of IS such as EDI, ERP EIA etc., relies on the availability

of the internet. Applications such as e-mails, instant messaging, electronic white boards, and other tools that support communication also require the existence of a functional network.

From the stages of e-governments presented in the previous section, extracted from the UN e-readiness report, the presence of static websites, dynamic websites, portals, information management systems such as shared databases and other information systems are essential for data management between administrative levels. Dynamic websites, portals, information management systems and shared databases enable information sharing between departments and they require a connection through networked computers. According to Schwester (2009: 113) internet based applications show of the potential to connect government departments, this claim relates well to the earlier comment from Ebrahim & Irani (2005: 590) on the presence of the internet via e-government. Therefore, integration of web-portals and departmental databases is crucial to government departments through e-government initiatives. Chiang & Hsieh (2007: 29) support Schwester's argument stating that, governments integrate portals and other digitalized trends within departments for better information sharing.

A database is the most common application in government agencies that support information sharing. Databases are a central part of IS generally. According to Garcial Molina et al (2002), DBMS are an organization of components of hardware and software that define and regulate the collection, storage and use of data within a specified environment. Departments implement data warehouses for storing and integrating the often used, historical and aggregated information extracted from multiple, heterogeneous, autonomous and distributed information sources (Garcial Molina *et al.,* 2002). Chiang & Hsieh (2007: 29) highlight that, in Taiwan, the government invested heavily in achieving the digitalization and computerization of records, data and information, by integrating databases to create an infrastructure that facilitates public service provisioning. Developing countries, Namibia included, are striving to develop an integrated information system that exists within its government departments.

2.5 Information sharing purposes

Information sharing in governments serves different purposes. One, the sharing of data and information enables the achievement of improved policy coordination between governmental agencies on a more timely and effective manner (UN, 2008). Thus, governments around the world are progressively turning to information sharing and integration, for solving problems in an extensive range of programs and policy developments (Headayetullah and Pradhan, 2009).

"E-government adoption can contribute significantly to the process of transformation of a government towards a leaner, more cost-effective institution" (UN, 2008). It can facilitate communication and improve the coordination of authorities at different tiers of government, within organizations and even at the departmental level. The statement from the UN e-readiness report concurs with statements from the literature; specifically Headayetullah & Pradhan's (2009) when they state that, e-government is a tool that revitalizes intra- and intergovernmental processes including information sharing. Jiang & Pengzhu (2010) express the opinion that, information sharing has emerged as a popular partnership target for government and governmental stakeholders such as businesses and citizens. Government reports, documents and studies indicate that information sharing is a requirement if public benefits are to be achieved (UN, 2008; Caffrey, 1998; Australian Government, 2009; OPM, 2005; Yan *et al.,* 2009; Ruhode & Owei, 2010). One public benefit that is discussed is accessing governmental information and services on a 24/7 basis, in the comfort of the user's home or at any public office. With the emergence of the e-government phenomenon, governments can expect to share information electronically. Therefore, e-government is driven by intra-governmental and intergovernmental need for information sharing. The literature further reveals that e-government is a concern for governments and international organizations alike (UN, 2008; Yan *et al,* 2009; Ruhode & Owei, 2010).

The purpose of information sharing through the implementation of e-government initiatives is to revitalize government processes. In return, the government achieves the intra and inter-governmental benefits as listed in the next sections.

2.6 Intra and intergovernmental information sharing

The use of ICTs to share information is now a celebrated phenomenon in governments across the globe. Information sharing indicates different things to different government sectors at different periods of time (Headayetullah & Pradhan, 2009). Information can be about a shared objective between two or more departments, it can be commercial transaction data, a notification of applied government services or of many other types.

The factors that lead to intra-government information sharing are the existence of enabling technologies, increased expectation of access to information by citizens and a desire to streamline transaction processing in governments, according to Caffrey (1998). As stated by Weerakkody *et al.,* (2011: 173) because government stakeholders became more internet-savvy and have experienced considerable electronic services from the private sector; they expect the same high standards of service from government agencies. Weerakody *et al.*, (2011: 173) are in agreement with the Caffrey (1998) argument that the presence of enabling

technology leads to information sharing. Employees within government departments need to share information, and departments that share an objective need to share information on the shared objective. It is evident from discussions in the literature, that ICT has the potential to revolutionize the way departments within government interrelate and reach the desired high standard of service(s). However, technological impediments and benefits to information sharing processes are heterogeneous.

The next sub-section presents discussions on information sharing benefits and impediments in governments, with the aim of identifying factors that can contribute to efficacy of information sharing in government departments.

2.7 Benefits of information sharing in governments

Stakeholders of governments benefit from the information sharing process in a variety of ways. The Australian government is of the opinion that, information sharing enables better governmental service delivery to stakeholders and improves policy development (Australia government, 2009). Such benefits do not only apply to the government of Australia but to developing countries governments as well. Developing countries are embarking on the quest of achieving information sharing benefits through e-government and expect to reap the benefits.

2.7.1 Intra-governmental electronic information sharing perceived benefits

Intra-governmental information sharing refers to the sharing of information within departments, agencies and ministries at all levels (Caffrey, 1998). Governments are divided into several levels, such as province, with some of these further divided into constituencies. Therefore, information is shared at all levels of governing. Government departments benefit significantly from the process of information sharing as follows:

• Increased efficiency/effectiveness (Caffrey, 1998; Australian government, 2009; UN, 2008). Re-use of information eliminates duplication of effort (Caffrey, 1998). Time spent on searching and sorting out files is reduced when ICTs are used to share information within the department, this leads to efficacy of government services and transparency. A government department's performance is increased by the re-use of existing information. For instance, information about each citizen, stored and ready for access, saves time and costs, as there is no need to register citizens at each service provision point.

• Increased timeliness and accuracy of business information submission to government (Caffrey, 1998). Access to business information at a central location minimizes duplication of

requests (Caffrey, 1998), reduces bureaucracy within government departments and increases responsiveness to business queries.

• Realizing ICT value. Information sharing allows government employees to be proficient in the use of ICT and of ICT tools through training(s), which leads to a better educated society and improved service delivery. Using ICT tools to share information within departments assists in improving data accuracy and accessibility leading to greater confidence in the data quality and accessibility (Australian government, 2009).

More benefits from intra-governmental information sharing can be listed based on the location and the needs of the government or researcher's interest. For example, information sharing needs of a government department as a result of analysed work activities.

2.7.2 Intergovernmental electronic information sharing perceived benefits

Sharing information between levels of governments is a concern for all governments divided into departments. According to the Australian government (2009), information sharing document, intergovernmental information exchanging enables the following benefits.

- Speedy decision making process and planning.
- Better informed cross-jurisdictional initiatives between governments
- Reduced duplication of efforts between government levels
- Enhanced communication
- Increased understanding of diverse government operations

2.8 Benefits and impediments of electronic information sharing

Perceived benefits and impediments discussed in this section lead to the efficacy of information sharing in the government.

2.8.1 Perceived benefits

Gil-Gracia *et al.*, (2007a) affirmed Dawes's (1996) three categories of information sharing perceived benefits; technical, organizational and political. These categories need to be used to discuss factors influencing information sharing in governments; technical flexibility includes, but is not restricted to, reduction of data duplication, processing, storing and presentation of information. According to Gil-Gracia (2007a) the benefits of electronic information sharing for government agencies range from data processing and information management, improved decision making processes, better coordination of the activities, to

high quality services. Politics plays a role in the implementation of information sharing projects in government. Enhanced dissemination and understanding of government ICT policy goals increases public accountability, promotes ICT integrating planning (Gil-Gracia, 2007a) and improves ICT project(s) management that leads to successful implementation of the projects. However the benefits of information sharing can be categorized under the three categories without applying the TAM model applied by Gil-Gracia.

Apart from all the benefits and opportunities that e-government can offer to government agencies, major impediments to the adoption of e-government such as the digital divide, organizational structure and poor information sharing infrastructure between departments, are explored in literature (Karokola and Yngstrom, 2009; Weerakkod *et al.,* 2011; Gil-Gracia, 2007; UN 2008). Impediments to information sharing differ from government to government, however impediments can still be grouped into similar or different categories as are used for benefits or Gil-Gracia's (2007a) group of ICT initiative impediments can be used. The following barriers emerge from e-government studies in developing countries, many inhibitors can be divulged based on the focus of the study; hence only inhibitors that are common to the literature are mentioned below. Though developed and developing countries can benefit in similar ways from information sharing, barriers to information sharing differ. For example, the digital divide is an obstacle in developing countries while in developed countries the main issue is security. The next section highlights some of the barriers to intra- and intergovernmental information sharing in developing countries. However, intra- and intergovernmental information sharing benefits outweigh the disadvantages. Attaining information sharing in departments and between departments first requires integrated interoperable information systems.

2.8.2 Perceived impediments

Gichoya (2005) asserts that in developing countries, ICT inhibitors do not prevent the implementation of ICT projects but they do prevent advancement and restrict implementation and sustainability. Heeks (2008: 3) expresses the opinion that "in developing countries government ICT projects fail; either a total failure where by a system is never implemented or implemented and immediately abandoned". Failure of IS or ICT projects in governments leads to inefficiency of information sharing processes. ICTs are known and described as tools and applications (hardware and software) that enable communication and information sharing within governments only if well implemented. The claims of these two authors indicate that there are impediments to ICT innovative adoption in developing countries. Discussed below are impediments hindering the successful implementation of ICTs that

would otherwise enable efficient and effective information sharing. It is argued here that, failure to implement ICTs results in inefficient electronic information sharing.

Technological impediment covers problems associated with hardware, software, presence of ICT infrastructure, and communication networks (Gil-Gracia, 2007b). Technology availability, the digital divide and compatibility significantly influence the sharing of information in and between agencies. The significant factors are discussed below.

Incompatibility of ICT tools and systems in government is one of the technical barriers that government agencies are experiencing, this result from the variety of ICT standards followed by each department. The absence of common ICT standards as guidelines for information systems development, results in disjointed information systems which cannot enable information sharing within and between government departments. Weerakkody *et al.,* (2011: 176) express the opinion that e-government is expected to provide access to citizens and other users from a single integrated gateway, which also requires participating agencies to share data to serve and achieve citizens' needs. Due to a lack of common ICT standards, information systems integration in governments is difficult to achieve, therefore common ICT standards should be considered the prerequisite factor from an e-government implementation perspective (Weerakkody *et al.,* 2011:177).

To overcome incompatibility in ICT infrastructure and tools, infoDev (2002) suggests that governments need to focus on using common standards throughout their offices; this will assist in shortening the development time and ensure compatibility as a common IT infrastructure is adopted

Fan & Zhang (2009) assert that **ICT capability and availability** influence information sharing at intra organizational level. IT capability refers to the availability of technology and expertise within the agency to enable participation in G2G information sharing (Fan & Zhang, 2009).

ICT standards and infrastructure - According to Beynon-Davies (2007: 16-17) ICT infrastructures are made up of hardware, software, communication facilities and ICT knowledge and skills, available to the organization. Fixed wired internet technology infrastructures are not as omnipresent in developing countries as they are in developed countries; instead, mobile technology infrastructures are omnipresent in most developing countries (ITU, 2010). However, most e-government initiatives do not support mobile applications. The lack of internet infrastructure in developing countries contributes to low implementation and usage of ICT tools and projects. A government's lack of information systems infrastructures to support organizational activities in the areas of information

collection, storage dissemination and use, in growth and rural areas is a result of the digital divide in developing countries. ICT standards and infrastructure impediments discussed are linked to other barriers, discussed under the organisational theme such as the budgets associated with any e-government projects.

Organizational impediments - These relate to organizational characteristics, such as the management support on ICT projects, structure, skills within the organization, and characteristics of project implementations, project champions, organizational needs, project management and budget allocation (Gil-Gracia, 2007; Tornatzky & Fleisher, 1990). Understanding of organisational information flows by project leaders, software developers and donors will enable identification of information sharing needs leading to improvement and development of purposely software applications.

Top management support and championing – the absence of top management support or an ICT project champion, can result in the failure of ICT initiatives. Researchers comment that the support and commitment of top management to provide a positive environment that encourages participation in information sharing and implementation of ICT initiatives is vital (Heeks, 2008; Akbulut, 2003). The agency needs to appoint a responsible individual to lead and introduce ICT initiatives in the agency. At national level, the government as an organization needs a responsible department to oversee the implementation of e-government.

Shortage of skills among civil servants - Hossan *et al.,* (n.d) indicate that, in spite of being sound technically, most e-government initiatives do not achieve their desired success. Initiatives fail due to a lack of skills to design, implement and use the information system. Lack of skills in developing countries is influenced by numerous factors such as ICT education not being compulsory in developing countries (Tembo, 2008). Such lack of skills to design, implement and use ICTs contributes to ineffective information sharing within and between government departments. As a result, government departments in developing countries rely on off-the-shelf ICT products. Novice IS consultants are hired to develop systems aimed at information sharing within or between departments. Heeks (2008) points out that, governments need skilled developers and project managers to lead these implementations and manage their ICT projects.

Organizational structure – The allocation of duties and the reporting channels within the organization determines how information should be communicated. Traditionally,

organizations have a top-down-bottom-up delegating and reporting route. This makes it difficult for employees to share information.

Funding and budgeting for ICT initiatives - Although the UN report (2008) indicates that the cost of ICT has reduced drastically and has therefore become more affordable than before, several researchers indicate that ICTs required to effectively implement and enable information sharing are expensive (Tembo, 2008; Narayan, 2007; Gichoya, 2005; Caffrey, 1998). The cost of ICT services remains a major barrier in Africa (ITU, 2009). The costs of ICT being a concern in developing countries, fiscal resources are a definite inhibitor to intra- and intergovernmental information sharing. For example, Namibia relies on donor funds to implement ICT projects in government departments.

Studies criticize donor funded projects stating that, some projects are carried out without a prior needs analysis (Gichoya, 2005: 176), as a result each department takes its turn to seek for funds in isolation to implement its own ICT projects. The downfall of a donor funded project can often be attributed to the fact that the feasibility study conducted is mainly focused on a specific community and its needs; and that the feasibility study does not include any aspects of intergovernmental agencies (Gichoya, 2005: 176). In addition for ICT use and diffusion to be effective in intra and intergovernmental information sharing it is inhibited by the high price of such ICT tools.

To overcome the prohibitive costs of information systems, Janssen & Wagennar (2004) suggest that government department implement a Shared Service Center (SSC). SSC is a model of outsourcing, whereby one vendor offers services to more than one client. According to Janssen & Wagennar (2004), the premise for a SSC is that, services provided to one local government can be provided to others with relatively less effort which leads to reduced costs and improved service delivery. SSC costs are less because the vendor reuses the same module for many clients. Only organizations that offer similar services can benefit well from the SSC concept.

Policies/legal factors can contribute negatively to the use and implementation of ICT initiatives in government. Examples of legal barriers in an information sharing project are restrictive laws and regulation, and the confidentiality of important data and information (Gil-Gracia, 2007).

People's perception of technology- Tembo (2008) pointed out that, people in developing countries face a challenge when wanting to efficiently use ICTs. Users' perception of ICT as complicated tools impacts negatively on information sharing within government departments.

Government employees are included in this group of users. If people perceive that ICTs are complicated, or have been invented to take over their jobs, the result is that ICTs are neither adopted nor utilized in the organization (Julibert, 2008:195). Negative perception towards ICT results from lack of ICT literacy and skills, poor training or lack of exposure to ICTs. Therefore, governments need to focus on training to motivate workforces.

Environmental factors consist of external factors and pressure from external entities (Akbulut, 2003) such as the availability of ICT vendors at a local level, support from public and private partners and the digital coverage in the country.

The digital divide - is the gap between people who have access to the internet and those who do not (infoDev, 2002). Globally, the digital divide between the sub-Saharan African region and the rest of the world is much more pronounced than the divide within the region (ITU, 2009). Africa as a continent consists of developing and least developing countries only. Developing and least developing countries are struggling with the problem of the digital divide more than developed countries. The problem is even extensive internally, given that large parts of developing countries are rural areas. The diffusion of ICT to such places in developing and least developing countries is very low. As a result, access to ICT within and between government departments remains a challenge. The inaccessibility of ICT makes it difficult to share information across traditional barriers and to give a voice to traditionally unheard government stakeholders (Tembo, 2008: 41). Researchers' discourses emphasize how important it is for governments to implement policies that address the digital divide within their own countries (Heeks, 2006: 9; Ochara-Mugandu & van Belle, 2010).

More barriers to intra and intergovernmental information sharing can be listed. Barriers are consequences of one another, for example; because of budget constraints for ICTs in developing and least developing countries, the digital divide exists, and user skills remain under developed. Individuals continue to think ICTs are difficult. Governments as organizations need to overcome ICT implementation impediments as discussed above under the five themes (technological, organizational, policies/legal, people and environmental). However, policies framework can be discussed under organisational theme. Government organizations need proper ICT infrastructure, more investment/budget allocation to ICT innovations, policies, skills development and training, hardware and software availability and compatibility through implementation of common ICT standards throughout government departments, project champions and support from top management, and a clearly defined implementation strategy for each department that includes a needs analysis and the identification of stakeholders.

2.8.3 Overcoming impediments

Agencies should focus on formulating guidelines for ICT initiative and implementations that includes technology standards to ensure common technology standards in all agencies (UNDP 2007). The definition of overarching national policies and an agency to guide the implementation of ICT initiatives will ease the information sharing process. Common technological standards will ease integration of ICT initiatives in and between public agencies. Laws that regulate collaboration among government entities, private enterprises and NGOs can assist policy makers in crafting meaningful reforms and can expedite the implementation of e-government (infoDev, 2002).

Studies on e-government information sharing emphasize the importance of investing in the renewal of government infrastructures and guidelines. ITU (2009) and UN (2008) indicate that mobile broadband shows growth in Africa, resulting in a high use of mobile technology. ITU (2009) suggests that Africa, which is characterized by developing countries, should focus on developing policies that sustain mobile cellular and internet user growth to extend access to the lower income segment of the population. According to the ITU (2009) report, policies focusing on enabling widespread broadband and promoting infrastructure sharing in all regions should be a priority for governments. Governments should focus on expanding internet access through initiatives such as community access centres, internet cafés, as well as the provision of education programs in schools (ITU, 2009) for the community.

2.9 Social media and mobile computing

Recent evolution of the web is characterized of disruptive social media technologies and mobile computing as means of enabling the sharing of information. Commonly used in government organizations are wikis, blogs and podcast which fall under the social media category. Government agencies rely on social media to engage with citizens for improved citizen services and cost savings (US.gov, 2013). It is further discussed that (US.gov, 2013) social media integrates technology, social interaction, and content creation to collaboratively connect online information. In the same vein, Smith (2009) emphasized that social media has enabled a revolution in user generated content, global community and the publishing of consumer opinion.

Through social media, people or groups can create, organize, edit, comment on, combine, and share content, in the process helping agencies better achieve their mission goals. (US.gov, 2013). Given the stated benefits and abilities of social media to organizations, it is imperative for government departments to consider using these technologies.

Mobile computing on the other hand is associated with portability, mobility or transferable of computing services. Mobile computing is centred on the availability of information including real time interaction between information users and creator.

2.10 Chapter summary

The literature reveals that G2G is a component of e-government that targets efficient and effective eAdministration in government agencies; information sharing is the main facet of this component (Heeks: 2006, 2008). Literature also was considered to answer research sub-questions as follows:

a) How information currently is shared between persons and departments in governments?

ICT initiatives are introduced in public departments under the umbrella of e-government, to enable information sharing within and between departments. Innovations such as IS, internet, emails, dynamic websites, portals, information management systems and shared databases, electronic white boards, and communication networks are required to enable information sharing in government departments (O'brien & Markas, 2005). Recently, government departments also make use of media technology and mobile computing to enable real time information exchanging and social interaction.

b) What are the purposes of sharing information within departments?

Information sharing purposes serve different purposes in different departments. Information sharing enables achievement of improved policy coordination between governmental agencies on a more timely and effective manner (UN, 2008), revitalize government processes, and also timely and efficient service delivery to citizens and businesses.

c) What factors influences the sharing of information in government departments?

The literature reveals that in developing countries, ICT initiatives fail to achieve their intended purposes or do not get off the ground (Heeks, 2008). It is argued that, for improved information sharing in departments at different governmental levels, there is a need to analyse information flows across government agencies focusing on the influential factors and recommend appropriate solutions. A good understanding of information flows will allow e-government project leaders, software developers and donors to identify information sharing

needs for improvement and develop purposely a software application that leads to efficacy of information sharing.

Information sharing in public agencies is influenced by many factors. These factors that influence the benefits and impediments of electronic information sharing that emerged from the literature can be put in to four categories: technology, organizational, environment, policy/legal related factors and people.

To achieve the objective of this study stated in section 1.3, the impediments and benefits of e-government are studied to contribute to the anticipated conceptual dimensions for information sharing. This conceptual dimension focuses on the effectiveness of information sharing in government departments. The factors emerged from literature are grouped and summarised in table 2.1: the Technological, Organizational, Environmental and People (TOEP) as shown in the table on the next page.

The next chapter's focal point is the theory underpinning this study and models applied to other information sharing studies.

Table 2.1 Information sharing influential dimensions

Information sharing influential dimensions	Technological	Organizational	Environmental	People
Positive factors	Flexible sharing of data & information	Reduced costs, timely decision making	Improved communication and information dissemination	Skills/ realizing ICT value
	Eliminates duplication of data	Better data management, accurate planning	Increased public accountability	culture
	Processing, storing and presenting	Improved coordination of activities, high quality service	Integration planning,	
Negative factors	Poor ICT infrastructure	Organization structure lack of organizational policies and legal frameworks	Digital divide	Perception towards ICT
	ICT capability and availability	Fund & budget allocated to ICT, ICT acquiring process(Namibia, tender board)	Availability of ICT vendors	Literacy, beurocracy
	ICT compatibility	Shortage of skills among employees	Lack of legislative policies at agency level	

CHAPTER THREE
THEORETICAL BASIS OF THE STUDY

3.1 Introduction

A variety of theories can be applied to studies on information sharing and the use of technologies in organizations. According to Blaxter *et al.,* (1998:185) a theory is a supposition which seeks to explain something. In qualitative studies theories are not only developed, researchers expand theories. This chapter discusses theories applicable to other information sharing studies, the underpinning Technology-Organization-Environmental (TOE) theory and how it contributes to the derived electronic information sharing effectiveness model. The information sharing model contexts and their relationships are presented in Figure 3.1. Lastly the rationalization of the derived information model for this OVC case study is rationalised.

3.2 Theories applied to information sharing and technology use studies

Although the underpinning theory describes the process by which organizations adopt technological innovations, it is used here because it accommodates factors leading to effective information sharing in government organizations, as described in the previous chapter. However, this derived information sharing model is appropriate, for information sharing in any organization and the case study in this thesis focuses on information sharing within government departments and the technology employed to share information and not the adoption of ICT. Technology, organization, environment, and people are the factors identified from the literature that influence the sharing of information in government organizations.

The derived information sharing model indicates that, information sharing is accomplished with information systems. This study focuses on information sharing, from the user and organizational position, to determine components of effective information sharing. Different theories have been useful to electronic information sharing studies. For instance, Yan *et al.*, (2009) present an analysis of influential factors of e-government information sharing derived from the DeLone & McLean model. The Yan *et al.,* (2009) study seeks to explain factors that influence e-government information sharing. The model indicates that the technology based, and trust-based antecedents should work together to influence the decision to share information in government agencies and among employees. The framework segments information quality, information use, perceived benefit, trust, perceived usefulness and perceived ease of use as antecedents of users' intention to share information (Yan *et al.,* 2009).

The widely discussed theory in information sharing studies is the theoretical model of interagency information sharing by Dawes (1996) and Landsbergen & Wolken (2001). The model shows how a sharing experience is triggered by a pressing problem suitable for IS based solution. The sharing experience provides insight that can help to improve the framework, promoting benefits and mitigating risks of future sharing experience. The study's findings suggest that technical, organizational and political barriers influence information-sharing (Dawes, 1996). The model of Dawes takes the benefits and risks of information sharing into account by stating that interagency information sharing benefits helps solving organizational individual and domain-level problems by a likely growth of productivity, integrated planning, policy development and organizational programs implementations (Dawes, 1996).

According to Dawes (ibid), successful information sharing can depend on an information sharing policy which takes into account a global view of how information resources can assist government services. Dawes (ibid) concludes that "government offices should focus on developing information sharing policies that will help to create an environment in which information sharing is reasonable and adequate to the agencies".

Akbulut (2003) expresses the opinion that the Dawes study is handicapped in some aspects such as technology. The study does not state how technology antecedents participate in interagency information sharing and that it does not expand to the local level of governing. Nor does the Dawes (1996) study elaborate on what technological tools are or can be employed in interagency information sharing (Akbulut, 2003). At organizational level, the study does not explain how organizational attributes such as available skills and size of the organization contribute to information sharing. Dawes does not look into other external factors that can inhibit or benefit public information sharing, such as: the environment, where the organisation situated.

The Dawes model is applauded for its emphasis on policy development. However, it is not adopted in this study for the two reasons stated earlier. Firstly, the theory does not include the influences of the environmental setting or the organization's attributes on inter-organizational information sharing and secondly, the study targets the state level, and does not discuss local government. Below is Dawes's model of information sharing.

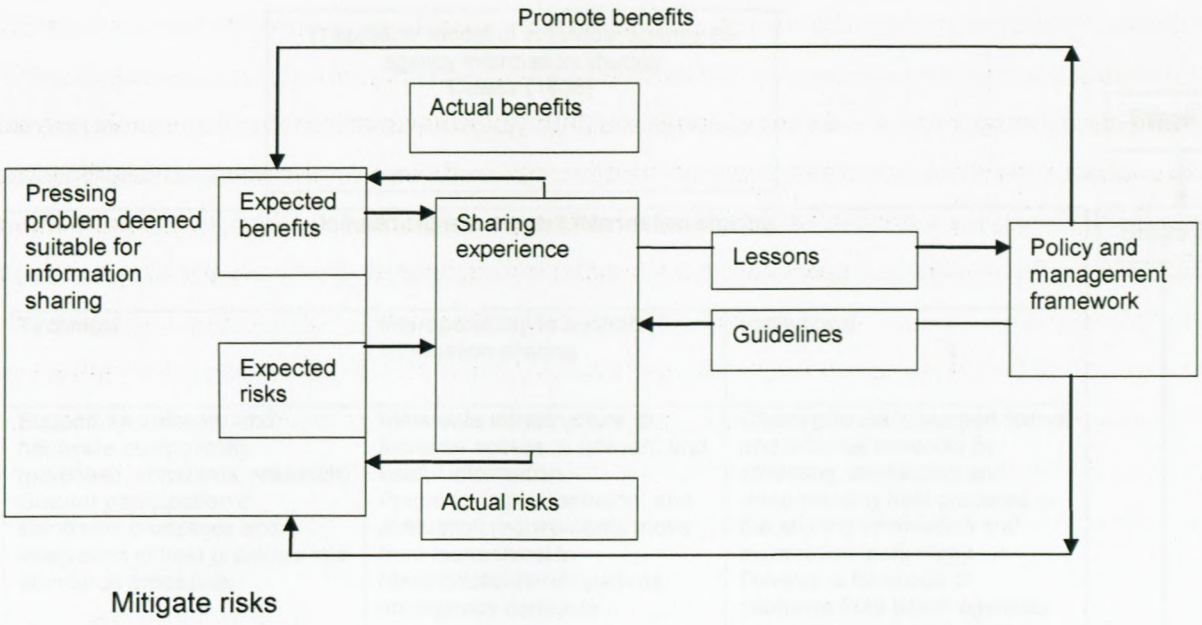


Figure 3.1 Theoretical model of interagency information sharing. Source: Dawes ,1996

Landsbergen and Wolken (2001: 206) extend the Dawes model by targeting the information system's interoperability of hardware and software to provide interagency information sharing. Incompatibility of technologies, inconsistent data definition, and organizational interest are some of the barriers to interagency information sharing according to Landsbergen & Wolken (2001: 208-210). The principal contribution of the model is the development of infrastructure to support agencies in sharing information. The findings of the Landsbergen & Wolken (2001: 211) study are divided into four groups that lead to successful interoperable systems:

1. Interoperability and sharing of information.
2. Identifying and work with critical success factors in the development of an interoperable system.
3. Developing federal/state architecture to support interoperability.
4. And recognizing that in a technological society; technical standards are public laws and improving systems are needed to support a government standard setting where that is vital to sharing information (Landsbergen & Wolken, 2001: 211-212).

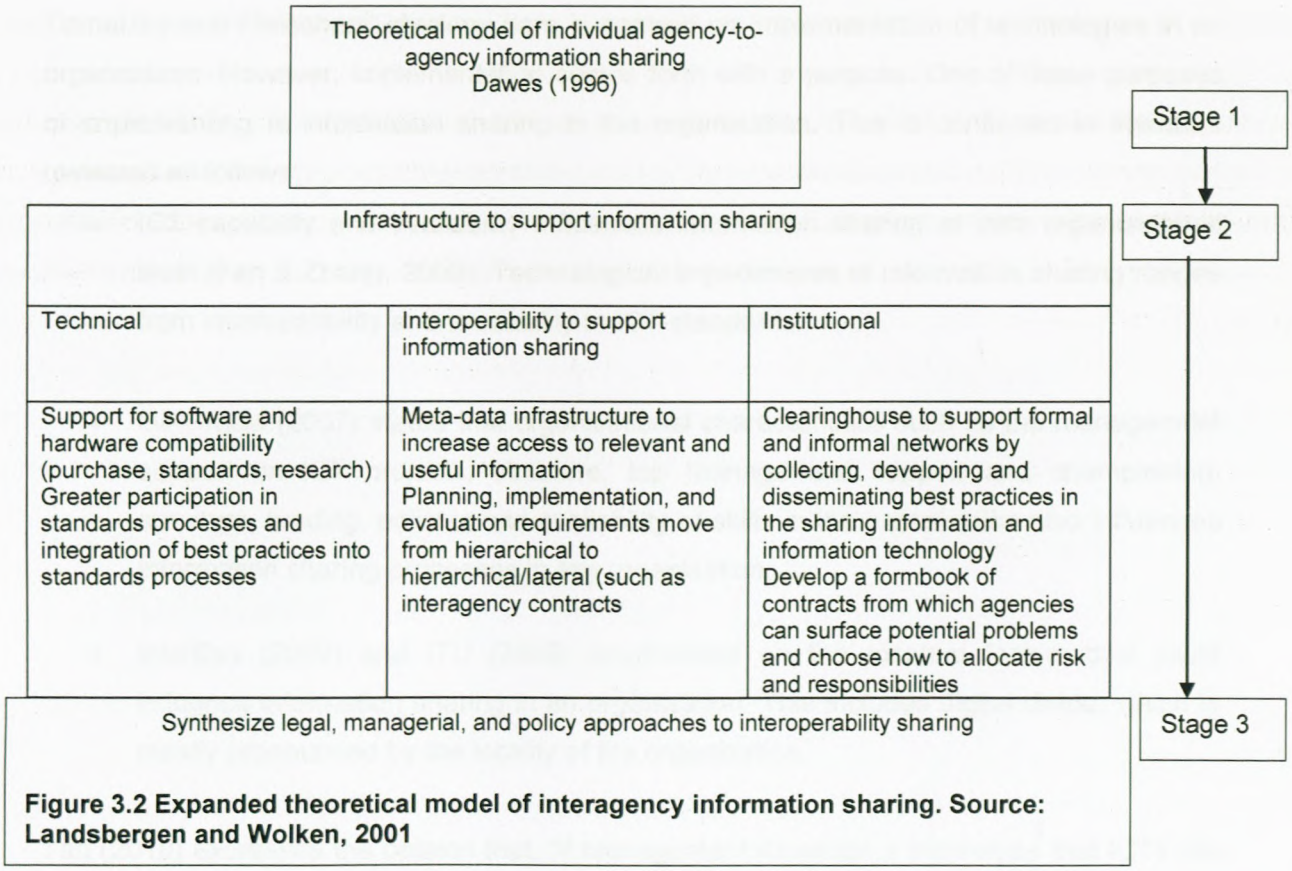


Figure 3.2 Expanded theoretical model of interagency information sharing. Source: Landsbergen and Wolken, 2001

Landsbergen and Wolken (2001: 206) highlighted the potential of fourth generation computers to increase the effectiveness of information sharing. Similar to the research of Dawes, Landsbergen and Wolken's (ibid) this study targets state interagency information sharing, which lacks emphasis on local government intra information-sharing efficiency, environmental and organizational factors and benefits.

3.3 Technology-Organizational-Environmental theory (TOE)

Tornatzky and Fleischer (1990) describe the TOE theory as the best way to look at the process by which an agency adopts and implements technological innovations influenced by the technological context, organizational factors and environmental factors leading to a technological decision making. According to Tornatzky and Fleischer (1990), technology, environment and organization factors influence the process by which a company implements technological innovations. The technology experience includes the internal and external technologies that are relevant to the organization (Tornatzky & Fleischer, 1990) be it appropriate to provide services or to manufacture products. The organizational context is comprised of the characteristics and resources of the firm, including the area, degree of centralization, degree of formalization, managerial structure, human resources, amount of

slack resources and relations in the organization (Tornatzky & Fleischer, 1990; Tan, 2010). Tornatzky and Fleischers' ideology here is centred on implementation of technologies in an organisation. However, implementation comes forth with a purpose. One of these purposes of implementing is information sharing in the organisation. This is confirmed in literature reviewed as follows;

- ICT capability and availability influences information sharing at intra organisational level (Fan & Zhang, 2009). Technological impediments of information sharing ranges from incompatibility and availability to ICT standards.

- Gil-Gracia (2007) stated that organisational characteristics such as the management support on ICT projects, structure, top management support and championing, structure, funding, policies and availability of skills in the organisation also influences information sharing processes in any organisation.

- inforDev (2002) and ITU (2009) emphasised on the external factors that could influence information sharing in an organisation. This includes digital divide, which is mostly pronounced by the locality of the organisation.

Tan (2010) expresses the opinion that, "if management develops a stereotype that ICTs are for firms or departments only, then, smaller budgets are allocated to ICTs". Tan's claim is similar to Heeks (2006) evidence stating that, smaller budgets are allocated to the acquisition of ICT than other departmental activities. Governments need to appoint project managers for efficient implementation of ICT projects to enable information sharing in organizations (Heeks, 2006). Tan and Heeks' assertions reflect the impact of human/people's opinion or views towards technology innovations adoption and implementation in the organization. Tan (2010) concluded that, if employees or managers face a notion that ICTs have a problem, it becomes an excuse not to fully utilise adopted innovations thus organisations facing such challenges need to focus on eliminating wrong perceptions among employees either by mobilising, encouraging in house workshops or ICT teachings. Organizational readiness in terms of skills and structure contributes to the organizational use of technology innovations in business and should be considered as a cultural aspect of technological innovation adoption process (Tan, 2010).

Perceived organizational composition can be related to the environmental setting in which the organization is operating. Tornartzky & Fleischer (1990), Tan (2010) and Kippert & Govindarajulu (2006: 148) focused on the environmental scope and composition of industry, the technology support infrastructure, the economy and the regulatory framework as external environmental factors critical to the adoption of innovations in organizations in investigating

the propositions that affect adoption and continuous utilization of web services in firms. Their earlier stated objective established that the organizational context defines the terms and resources available to support the adoption of innovations, while the environment defines the geographical location of operation of the company influences competitors and the ability to access resources supplied by others as well as the interaction between the company and related stakeholders. Tornatzky and Fleischer (1990) illustrate the three contexts contributing to the adoption of technological innovation in the diagram below.

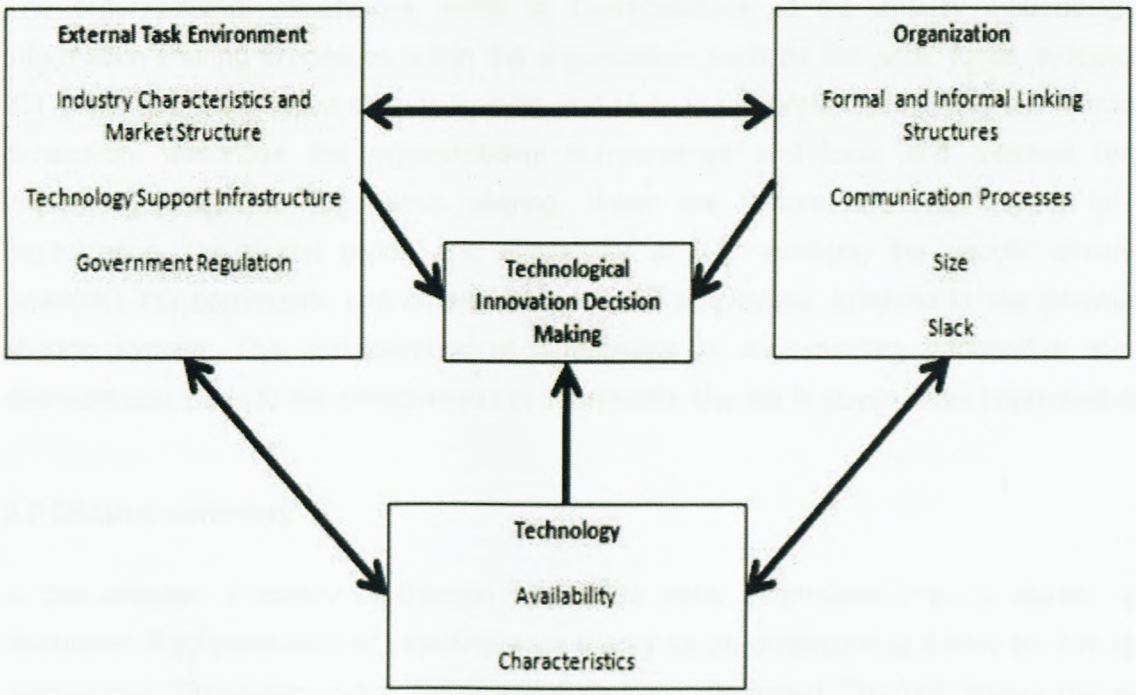


Figure 3.3 The Context of Technological Innovation. Source: Tornatzky and Fleischer, 1990:153

TOE theory covers the impediments and benefits of ICT implementation in developing countries discussed in chapter two. The proposal is to adopt this theory to provide modelling for an information sharing conceptual framework and to explain technology use in government departments. TOE themes are espoused to describe factors important to improving information sharing within government departments.

From the literature, e-government consists of technological tools, applications and processes in government organizations that enhance innovation. Therefore, TOE theory contributes to the unified model primarily because it enables identification of the use of technology in organizations and the significant environmental factors. TOE contexts are critical to information sharing analysis, such that technological tools, policy and processes enable information sharing in government organizations situated at different governing levels and influenced by external environmental factors such as policies.

3.4 TOEP / TOPE e-government information sharing effectiveness model

TOEP dimensions were derived from the identified information sharing factors in literature. Factors identified in the literature and presented in table 2.1 the. The technological dimensions explain the technology factors influencing information-sharing in government organizations such as ICT infrastructures, capability, availability and compatibility of ICTs.

The organizational dimensions refers to characteristics of the agency influencing the information-sharing processes within the organization such as firm size, funds allocated to ICT initiatives, information sharing training and skills in the organization. The environmental dimension, describes the organizational surroundings and local and external factors influencing electronic information sharing, these are factors such as location of the organization, the digital divide and availability of ICT vendors, the people dimension describes the community and others, who are not employees, involved in the information sharing system. The consideration of dimensions in implementing information sharing channels can leads to the effectiveness of information sharing in government organizations.

3.5 Chapter summary

In this chapter, a variety of theories applied to other information sharing studies were discussed. Rationales for not selecting each theory as an underpinning theory for this study were stated. The underpinning theory was stated and discussed. The TOE theory has been applied to different studies concerning technological innovations in organizations and is applied in this thesis for information sharing and not adoption of innovations, as the underpinning theory.

CHAPTER FOUR
RESEARCH METHODOLOGY

4.1 Introduction

This chapter explains the design and methodology adopted in this study. Babbie and Mouton (2010: 278) clarify design and methodology saying "research design is the blue print of how the researcher intends to conduct the research while the methodology is entailing the approach and tools, and procedures applied to the study". However, methodology is at higher level that includes design and development methods. Tools are part of methods. Lastly in this chapter, are discussions on the data collection methods and data analysis techniques.

4.2 Research taxonomy

Qualitative and quantitative are dichotomous approaches in social research. The difference between the two paradigms lies in the quest for knowledge and the complexity of inquiry (Henning et al: 33). This study is qualitative and the research design is a case study. The qualitative research is any research that uses qualitative data gathered preferably in text format (Struwig & Stead, 2001: 12). A typical qualitative research is characterized by the following, according to Babbie & Mouton, 2010.

a) a detailed engagement with the object of study,

b) a selected small case(s) to be studied,

c) openness to multiple sources of data, flexible design features that allow the researcher to adapt and make changes where and when necessary.

4.2.1 Qualitative methodology and case study design

According to Henning et.al (2004: 40) different methodologies of qualitative research designs exist in social research, one of them is the qualitative case study. A qualitative case study is employed to obtain an in-depth understanding of the situation and actors involved. The case study method is characterized by the focus on a phenomenon that has distinct boundaries, a description of how, when, where and why things happen (Henning, 2004: 41). Therefore, this study focuses on the work activity of the OVC registration in the division of CA. Researchers such as Yin (2004), and Stake (1995), discuss the different principals of case study research. Yin (2004:18) defines the case study as an empirical inquiry based on investigating a contemporary phenomenon in depth and within its real life situation. Yin (2004: 20) discusses a different use of case study research, stating that the case study can be used to explain or illustrate or describe or enlighten. This case study is aimed at looking at the information-sharing processes in a descriptive mode.

The selected work activity is an intangible issue. The conceptual framework of the case study focuses on key aspects such as stating the purpose of the study, and the explanation of concepts. The aim and definitions of the key concepts are stated in section 1.3 and 1.6 respectively. The construction of this study's framework, stated in chapter three, is a combination of literatures. Babbie & Mouton (2010: 282) explain that the construction of a case study framework is based on the literature review and researcher's experience. Case study research principles include an emphasis on the contextualization of the study, the multiple sources of data and the analysis of the gathered data. For the contextualization of this case study and the data analysis, see section 4.3.2 and 4.4 respectively.

4.3 Location of the case study

The case being studied is the Ministry of Gender Equality and Child Welfare (MGECW), Child Allowance division, in the Khomas and Oshana regions, respectively. The MGECW is one of the Namibian government organizations, with its Head office located in the Khomas region and regional offices scattered in thirteen regions (Appendix B). The rationale for choosing these two locations is that, the ministry's head office is located in Khomas, and this is where all decisions are instigated and then communicated to the regional offices. The presence and use of ICTs at Head Offices might be more extensive than at the Oshana office, which is located in an upcoming town (Ongwediva), and where most of the government employees and locally living applicants may be less ICT oriented than the employees at the Head Offices. Information is exchanged between these two governing levels.

4.3.1 Unit of analysis

Babbie & Mouton (2010: 282) say that the unit of analysis for a case study is rarely isolated from or unaffected by factors in the context in which it is embedded. They later emphasize that to understand and interpret the case study, a description of the context, in particular, is required. Therefore, figure 4.1 shows the organizational-landscaping surrounding the unit of analysis which is the CA division within the child welfare service department (ministerial departments). The landscape model depicts administrative boundaries around the unit of analysis. According to Korperla *et al.,* (2008), the landscape model describes sufficient and clear, yet detailed, aspects of information sharing needs, by clearly identifying areas of administrative power or control, and by describing political authority from local to national as well as according to geographical area.

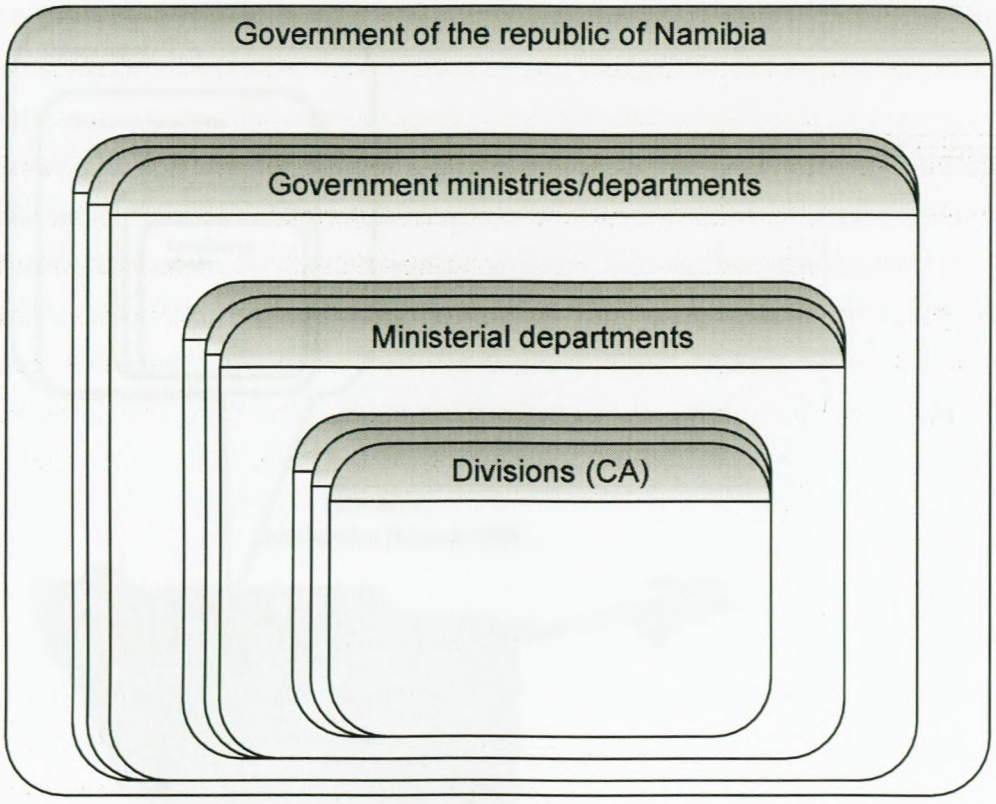


Figure 4.1 Organisational landscape.

The landscape is intended to define the administrative control around the unit of analysis. The administrative control is necessary in this study to understand the organisational and environmental settings around the unit of analysis.

The unit of analysis here is the work activity when interacting with information - OVC registration, taking place in the CA department at national, regional and constituency administrative levels respectively.

The researcher examines the work activity focusing on information flows between actors at different organizational localities and their roles. Diagram 4.2 shows Namibia's administrative regions. Two regions (Khomas and Oshana) are the targets in this study. As stated previously, the rationale for choosing the two regions is that, the government department's head offices are located is Khomas region – Windhoek, while the Oshana region has one regional office and ten constituency offices, like all the other 12 regions. The ten Oshana constituency offices are located in and represent villages and rural areas. OVC related information is exchanged between these constituency, regional and head offices.

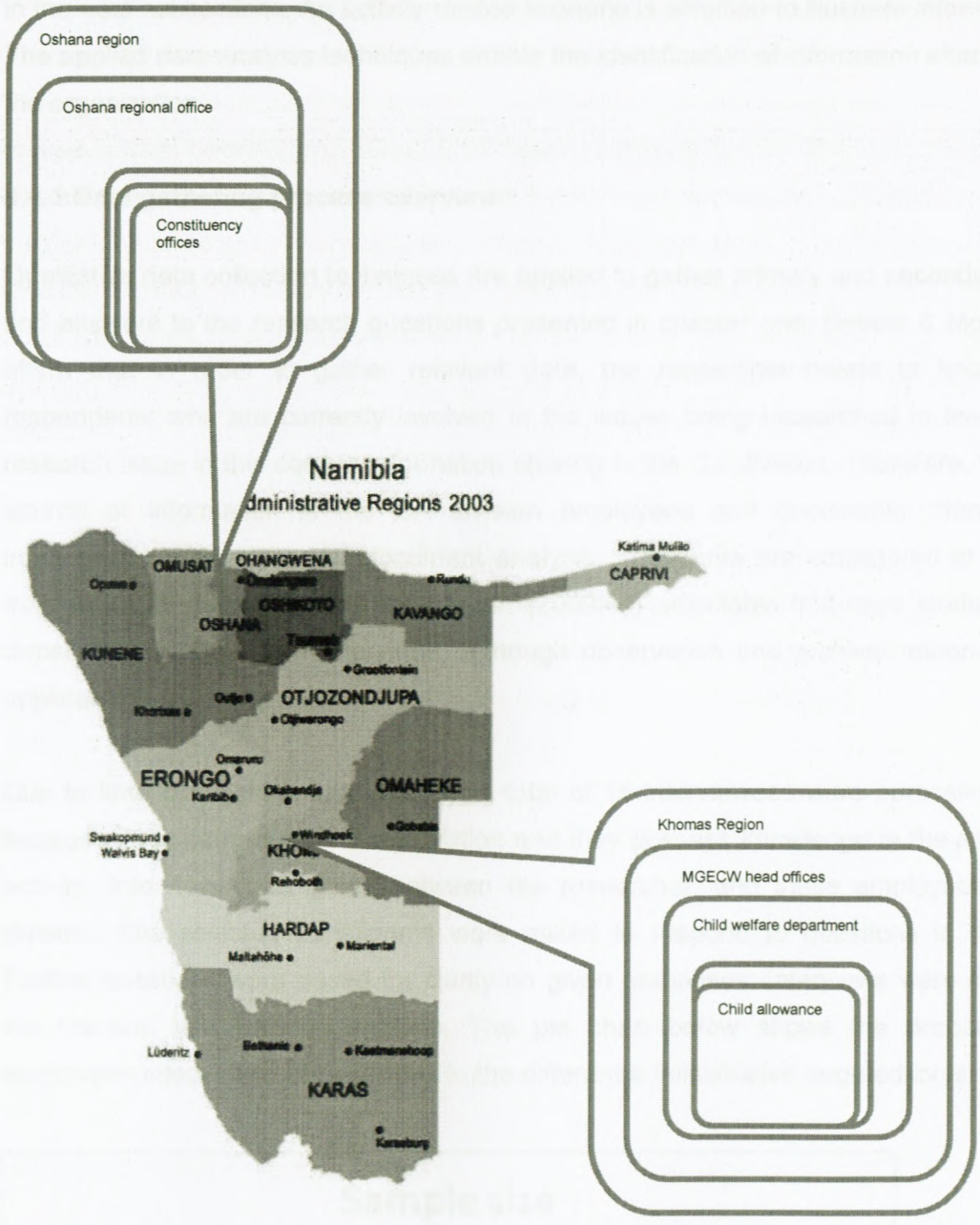


Figure 4.2: Explored administration landscape diagram

4.4 Research methods

Babbie and Mouton (2010: 75), simplify the concept of research methodology by explaining that "a research method focuses on the research process and the tools and procedures to be used, it points out tasks such as data collection or sampling at hand, the methodology focuses on steps in the research process and the most objective procedures employed". To establish information sharing needs and to understand how different factors influence information sharing in an organization it is appropriate to study an organization in empirical settings. Therefore, contextualization of the case study is considered and presented in section 4.3.2. Qualitative data collection techniques and analysis are applied and discussed

in the next subsections. An activity related scenario is selected to illustrate information flows. The applied data analysis techniques enable the identification of information sharing needs in the organization.

4.4.1 Data gathering process overview

Qualitative data collection techniques are applied to gather primary and secondary data and find answers to the research questions presented in chapter one. Babbie & Mouton (2010) affirm that in order to gather relevant data, the researcher needs to know and find respondents who are currently involved in the issues being researched in the study. The research issue in this case is information sharing in the CA division. Therefore, the targeted source of information is the CA division employees and documents. Semi-structured interviews, observation, and document analysis procedures are considered to be sources from which to gather primary data. Dunn (2009:49) articulates that case studies are often dependent on data from interviews, although observation and archival materials are also applicable.

Due to time constraints, in this study, a total of 15 interviewees were purposively selected because, they carry out OVC registration and they possess knowledge in the selected work activity. Interviews took place between the researcher, and these employees in the CA division. The selected participants were asked to respond to questions in Appendix E. Further questions were posed for clarity on given responses. Interviews were conducted in the Oshana and Khomas regions. The pie chart below shows the proportion of CA employees interviewed at each level in the different administrative targeted locations.

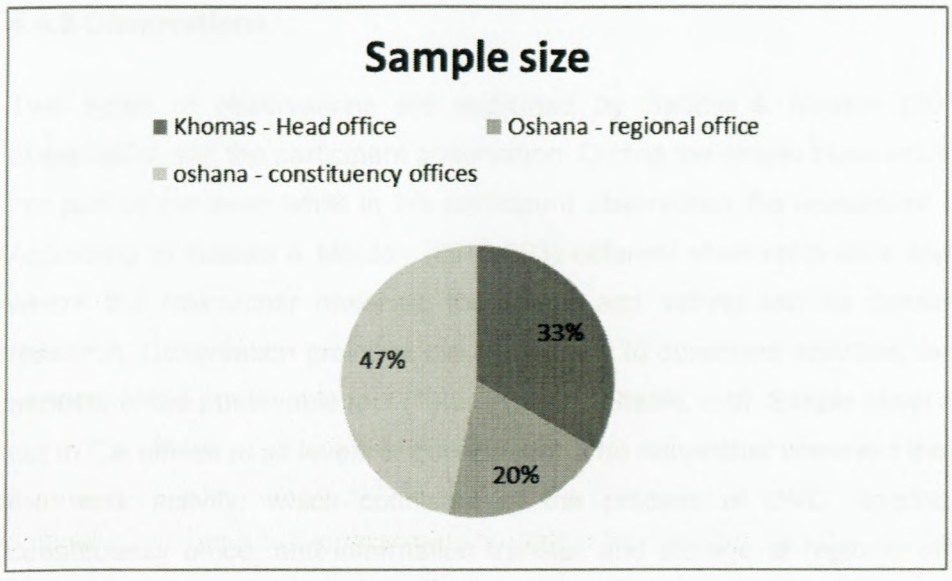


Figure 4.3 Interview respondents

Documents such as the foster care MGECW plan of action, the effectiveness of child welfare grants in Namibia and the Namibian ICT policy, were reviewed in the process of the study. Documents are referenced at different sections of the thesis. Another source of information that contributed significantly to the thesis was the ministerial website under the Child welfare services directorate link (www.mgecw.gov.na/childwelfare).

4.4.2 Semi-structured interviews

Factors influencing information-sharing effectiveness contexts (see chapter three) were adopted to construct interview questions (Annexure C). Contexts were subsequently aligned with the research objectives in section 1.2. Questions were honed to yield answers openly about the work activity, the activity, the mediation technology (shared object, source and destination of information), the activity actors and the challenges encountered. A qualitative interview schedule may simply involve a series of headings or may have a few carefully worded questions which are usually open-ended to allow respondents to elaborate (Babour, 2008).

The advantage of a semi-structured interview is that it enables the interviewer to maintain consistency during interviews and be in control of the interview process (Sapsford & Jupp, 2006: 99). Interviews took place between the researcher and employees in the targeted department. Permission to contact interviewees was obtained from the Permanent Secretary's office, (annexure A). Interviews took a maximum of 25 minutes, depending on the participant's free time. All interviews were recorded and transcribed later.

4.4.3 Observations

Two types of observations are explained by Babbie & Mouton (2010:293); the basic observation and the participant observation. During the simple observation, the researcher is not part of the team while in the participant observation the researcher is part of the team. According to Babbie & Mouton (2010:293) different observable data and physical locations where the researcher observes the space and setting can be considered in qualitative research. Observation provides the opportunity to document activities, behaviours and other aspects of the observable fact (Tylor-Powell & Steele, n.d). Simple observations were carried out in CA offices at all levels of government. The researcher observed the actors carrying out the work activity, which consisted of the process of OVC registration initiation in a constituency office, and information transfer and storage at regional offices and the head office. Pictures were taken during observations to provide information on the setting of these processes.

4.4.4 Document analysis

Documents pertaining to OVC registration were selected and reviewed before the interviews took place, to familiarize the researcher with the selected work activity. More documents were sourced from the ministerial website.

4.5 Data analysis techniques

Two data analysis techniques are applicable to this study, qualitative content analysis and the Activity Driven Needs Analysis (ADNA) technique. ADNA is used to analyse information flows between offices. While the content analysis technique applies to interviews transcripts, aiming to draw conclusion on the phenomenon under scrutiny based on the interview responses. The techniques are described in the next sub-sections.

4.5.1 Content analysis

Methods such as ethnography, content analysis, grounded theory, phenomenology and historical research (Hsieh & Shannon, 2005) are applied in qualitative data analysis. Content analysis is applicable in this study to analyse responses to the open-ended interview questions. The interviews were transcribed. Since the emergence of this technique in the 1950s, the technique has been applicable to studies in fields such as Nursing, Communication and Politics (Hsieh & Shannon, 2005; Granheim & Lundman, 2003). Several authors refer to qualitative content analysis. Hsieh & Shannon (2005) describe content analysis as a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns. Content analysis is a process of integrating data to identify patterns through the process of coding and recoding interview transcripts to draw conclusions on the phenomenon under investigation. Content analysis is distinctive, one aspect of content analysis is that, the method focuses on the subject and context, and emphasises differences between, and similarities within, codes and categories (Granheim & Lundman, 2003). The second aspect is that the method deals with manifest and latent content in a text. The manifest content that is, what the text says, is often presented in categories, while themes are seen as expressions of the latent content, that is, what the text is talking about" (Granheim & Lundman,2003). Content analysis technique however can be time consuming.

Hsieh & Shannon (2005) describe three approaches to content analysis, the conventional, the directed and the summative. The difference between the three approaches centres on how the coding process and rules were developed. Here, the direct content analysis is applicable. Conventional, directed and summative content analysis all follow the seven steps

discussed below in this section, aiming to establish the existence of concepts in a text. The uniqueness of the directed method is that the themes are drawn from the applied theory. The researcher can efficiently extend or refine an existing theory (Hsieh & Shannon, 2005). While in the other methods, a theory may not be applicable to the study and themes are drawn from the collected data or previous related studies. In this study, the researcher aims to derive a conceptual model for information sharing based on the underpinning theory stated in chapter three. Therefore, the contexts from the underpinning theory become the themes of the content analysis and are subsequently broken into sub-categories.

The process begins with coding the texts (Hsieh & Shannon, 2005; Granheim & Lundman, 2003). However for easy referencing for readers and reviewers, the researcher can begin with coding the transcripts and move on to coding according to identified categories or themes. Zhang & Wildemuth (2009) in their paper on qualitative analysis refer to content analysis in information and library science. The duo outline steps to follow when carrying out a qualitative content analysis after data collection. Similar steps are emphasised by Hsieh & Shannon (2005). The steps are summarised in chapter five.

4.5.2 Content analysis trustworthiness

In qualitative research, measures for achieving trustworthiness are evaluated in relation to the procedures used to generate findings. The concepts credibility, transferability and dependability have been used to describe and determine aspects of trustworthiness (Granheim & Lundman, 2003; Zhang & Wildemuth, 2009; Elo & Kyngas, 2007) of content analysis findings. *Credibility* involves selecting the appropriate method for data collection, the amount of data collected, how well categories and themes cover data (Graneheim & Lundman, 2003). Elo & Kyngas (2007) suggest that the researcher should aim at describing the analysis process in a much detailed manner when reporting the findings to achieve credibility. *Transferability* means that "the researcher provides data sets and descriptions that are rich enough so that other researchers are able to make judgements about the findings" (Zhang & Wildemuth, 2009). Transferability of data is enhanced by providing a detailed description of the phenomenon, the selection of participants and the process of analysis (Graneheim & Lundman, 2007). Ensuring *consistency* of the study process leads to dependability of the study findings (Zhang & Wildemuth, 2009).

4.5.3 ADNA

Activity Driven Needs Analysis is a methodology that can be used to explore the information sharing needs of the government departments in this study. ADNA is an exploratory methodology originating from Activity Theory. It provides a comprehensive basis for

understanding the human, technological, temporal and organizational aspects of work as a systemic whole as expressed by Korpela, Mursu and Soriyan (2002: 126). Luukkonen et al. (2010) points out that ADNA approach in Information Systems Development (ISD) aims at explore work activities to understand the information needs and to seek direction for possible and realistic solutions. Therefore, ADNA can be used independently without employing Activity Theory (Korpela, 2008).

The technique has so far been applicable to case studies in health informatics, such as the maternity pathway in the Pundong – Shangai (ref), China and the Verdenburg town (ref), South Africa and Mozambique, in Southern Africa. The technique consists of four stages, namely:

(a) flow of service between organizations and stakeholder,
(b) flow of Authority / structure of management,
(c) financial structure and lastly,
(d) information flow around the object under study.

The four stages are defined but not all are relevant. However, researchers can be selective of the stages applicable to their studies. For example, monetary flows are not of concern to this study. Therefore, the fund flows stage (c) is excluded. The Information flows stage (d) is of importance. Therefore, this study's emphasis is on the flows of services (a) between the organisation and stakeholders and flows of information (d) between administrative levels.

ADNA technique requires the use of legends to model stages discussed above. Legends may vary depending on the researcher's chosen software tool and the scientific and nature of the study. Figure 4.4 are applicable in this study, modelling information flows and need service relationship between entities using Microsoft Office Visio 2007.

In summary, the technique is suitable for data analysis because of the emphasis on the environmental landscape of the organisation under investigation, the detailed exploration of activities within the organization scattered at different locations, the ability to bring the domain experts (users) together and the ability to identify information needs by describing information flows within and between departments. Below, are legends used to illustrate information flows and service needs.

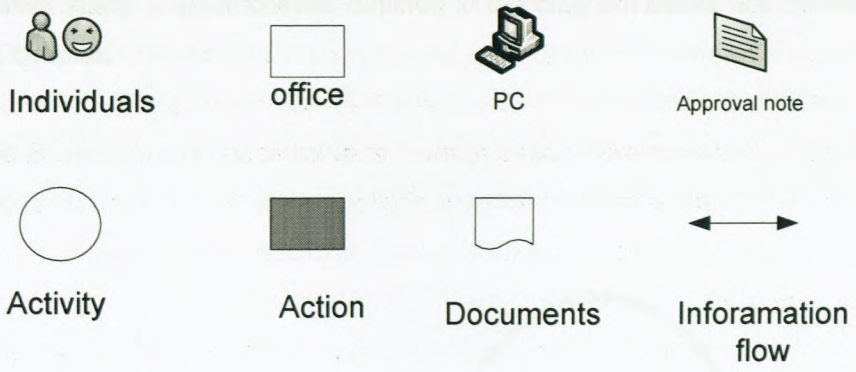


Figure 4.4: Legends

4.6 Sampling

The sampling technique involves the random selection of a small sample; emphasis is on information-rich samples and not on generalizing (Struwig & Stead, 2001: 124). Purposeful random-sampling is characterized by a number of sampling techniques. Babbie and Mouton (2003:166) state that, it is appropriate in qualitative studies to select a sample on the basis of the expertise of the population being studied, elements in the population, the researchers own judgments or the purpose of the study. The researcher purposely selected employees dealing with the OVC registration process, because they can be regarded as a unit of observation with knowledge of the unit of analysis under research. A critical case sampling technique has been followed to select the OVC registration activity and focus on the actors. Logical but not broad, generalizations may be made from critical cases (Struwig & Stead, 2001: 123). Therefore, generalization made in this thesis applies only to Namibian government organizations at head offices, regional offices and constituency offices.

4.8 Chapter summary

This chapter outlines of methods used to explore information sharing in government departments. The two commonly used social research taxonomies (qualitative and quantitative approaches) were stated and briefly described. The qualitative case study approach is applicable in this study and it is explained in section 4.2.1. The administrative boundaries around the CA division are presented in the form of an organisational landscape model. The idea behind landscape model is to outline organisational boundaries around the investigated department. The Namibian map is applicable to show the locations, in terms of regional demarcations, of the two units of analysis. The units of analysis are the Oshana regional and constituency office and the Head Offices in the Khomas region. Henning (2004) suggests that, an emergent plan with a strong logic is a better option to carrying out a

qualitative study. Logical phases outlined in the diagram below are carried out and discussed in this chapter.

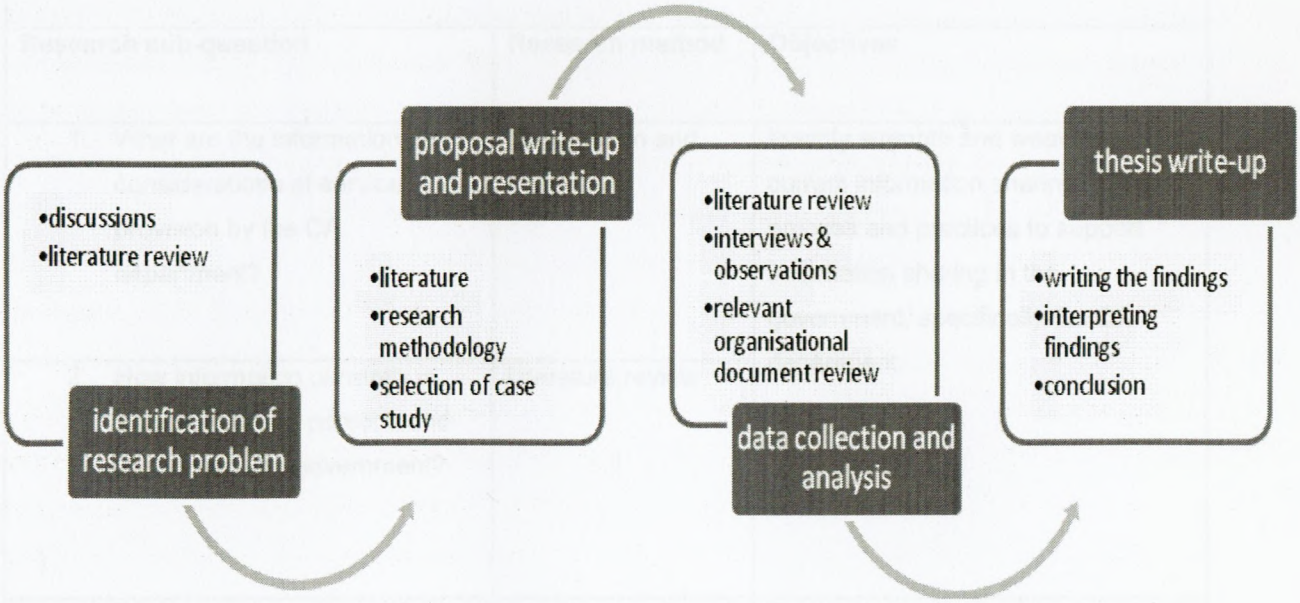


Figure 4.5: research process

Research questions were formulated, and different data collection methods (see section 4.4) were employed to explore and find answers to the research question. Table 4.1 shows the research question and sub-questions and data collection methods used to answer each question.

Table 4.1 Matching research question, sub-questions and objectives

Research problem: Information sharing needs for government departments are uncertain. It is not clear what influences to what degree information is utilised and shared between government departments.		
Research question: What are the information sharing considerations for government departments?		
Research sub-question	**Research method**	**Objectives**
1. What are the information considerations of service provision by the CA department?	Observation and interviews	Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government, specifically the CA department.
2. How information currently is shared between persons and departments in government?	Literature review	
3. What are the purposes of sharing information within departments?	Interviews and literature review	Establish what information is shared and for what. Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government.
4. What influences the sharing of information in government departments?	Literature review	Identify information sharing influential factors in government departments.
5. How can information sharing in government departments be improved?	Analysis of Q1, Q2,Q3,Q4 and Q5	Recommend a viable dimensions for information sharing improvement.

The table was designed to encourage a coherent and methodical approach to the research problems, relevant questions and applicable data gathering techniques. Reviews of the literature found relevant to each question are discussed in chapter two (2), leading to the discussions of interviews and observations in chapter five. This is purposefully and systematically done to ensure attaining the objectives of the thesis. Interviewees were selected following a purposive random selection process. Interviews, observation, and document analysis are techniques used to collect data. The methods sought to explore the information needs and the use of ICT within the CA department. Questions used in interviews were matched to the objectives to provide guidance, and to ensure that the research objectives were addressed. Content analysis and ADNA were the selected data analysis methods for this study and were discussed in detail in section 4.5.

CHAPTER FIVE
RESEARCH FINDINGS AND DATA PRESENTATION

5.1 Introduction

This section presents the findings derived from the data collected. Empirical data was collected using interviews (taped transcripts), observation and child allowance services related document were reviewed to answer the research sub-question; What are the information needs of service provision by the CA department? In interviews, the above question was divided into manageable questions linked to TOEP dimensions identified and discussed in chapter two (see Appendix D). Content analysis technique and ADNA are discussed in chapter four were applied to analyse and present information respectively in this chapter with greater emphasis on content analysis steps applied. The selected work activity is described, stakeholders are listed, the access to and use of ICT in OVC registration is discussed and the information sharing needs identified are discussed. Diagrams and descriptions of service flows, information flows and information needs are part of this chapter. CA information sharing needs identified in this study are akin to the information sharing barriers discussed in chapter two and three are tabulated. Also, information sharing needs and information sharing arrangements in the pipeline are discussed.

5.2 Data analysis steps

The content analysis steps below are adopted from Zhang & Wildemuth, (2009) and carried out as outlined in the discussions and the tables.

5.2.1 Data coding and implications

Step 1: The researcher performs data preparation, which involves recorded data transcribed verbatim or in a summative way. In this study data was transcribed verbatim. Two (2) regional officer and ten (10) constituency officers were interviewed.

Step 2: Data classification. Classification of the text into themes expressed in a form of a single word, a phrase, a sentence or paragraph should be completed and codes assigned to each theme before use. Themes were constructed according to the information sharing influential dimensions identified from literature. These factors were first adopted in interview questions designing process.

Themes

Technology, Organisation, environment and people

Step 3: Develop categories and a coding scheme. Categories can be developed from the theories applicable to the study or inductively from the data. Different highlighting colours are used to indicate positive, negative, not sure and a combination of yes and no (positive and negative) responses. At this stage categories and sub-categories were identified inductively from the data and data analysis progress.

Table 5.1: Themes, categories, sub-categories for content analysis

Themes	Categories	Sub-categories
Technology	ICT use	Available ICTs
	Storing and mediation technologies	Mediation technologies between offices
		Anticipate ICTs and needs
Organisation	Information arrangements	Information sharing arrangements in place
	Activity stakeholders	Information sharing partners and stakeholders
	Information sharing guideline	Information sharing guideline
	ICT readiness	Availability of ICT
Environment	Information flow to the next desk	Whether the office has Electricity or not
	Office location	Where the office is located
People (internal)	Information sharing - perception	Perception about ICT and information sharing The ability to share information
	ICT perception	ICT skills development & extent
	-actual capability (readiness)	skills needed

Table 5.2: Themes colour coding

Colour	Theme
peach	Environment
blue	Organisation
Yellow	Technology
grey	People

Theme colours were used in interview transcripts to identify phrases, words or statement that describes each theme. Furthermore, different colours were used to classify the status of each of these responses. Affirmative, negative, vague as well as mixed responses were categorised to enable the researcher to state the implications that were revealed, in order, in the end to draw conclusions and make recommendations for the department.

Table 5.3 Colour coding

Colour	Description
green	Positive (yes)
red	Negative (no)
grey	Not sure
	Partly yes/partly no

Table 5.4 Implications of interviews

Question	Theme	Categories and sub-categories	Responses and colour coding implications
	Environment		**Question: Q, follow-up question: FQ, Response: R**
Q: Where the office is location? FQ: Is that a village or township?		Information flow to the next desk. Office location	R: "...Okaku village, it's a constituency office."(CO, AH2) R: "Oshakati west" (CO, AH1) R: "Uuvudhia constituency, eengombe village" (CO,AH3) R: "I am at Omegee village, in oshakati east." (CO, AH4) R: "Omundja village, 30km from oshakati." (CO, AH5) R: "Uukwiyu-ushona." (CO, AH6) R: "... is located in Okatjali village." (CO, AH7) R: "In eros." (WCO 14) Q: what office is this? R: "This is database office." (HO, AH8) R: "I'm based at OPM." (HO, AH9) R: "...I read through the application, approve and from here it goes to or system data office". (HO, AH10) R: "...it's a subdivision of the ministry of gender but, it is here at the OPM." (HO, AH11)
Q: Do you have electricity at your office?		Electricity available or not	R: "...Not that [laughter] because I am at the rural area...there is no electricity." (CO, AH3) R: "...we have electricity". (CO, AH4) R: "Yes we do." (CO, AH5) R: "We have electricity but not ICT tools you are talking about." (CO, AH7)
	Organisation		
Q: Are you aware of information sharing guideline document?		Information sharing arrangements	R: "No, I'm not aware if there is any document..." (CO,AH1) R: "Sometimes . . .a memo" (CO, AH2) R: "No, I'm not aware of that." (CO, AH3) R: "...I'm...no" (CO, AH5) R: "No" (CO, AH6 & WCO 14) R: "I think that one you can get it from social workers...I think they have." (HO, AH8) R: "No, I am not aware of any guidelines" (HO, AH10)

			R: "No" (HOPM 11)
Q: Who are your information sharing partners?		Stakeholders	R: "...other constituencies and the RO." (CO, AH1) R: "colleagues or supervisors ... and clients..." (CO, AH2) R: "colleagues and clients" (CO, AH3 & WCO 14) R: "organization . . . linked to the ministry like Yelula, CAFO we refer children's there." (CO, AH4) R: "I share with our clients, colleagues..." (CO, AH5) R: "community and colleagues at constituencies and at regional office." (CO, AH6) R: "We share information with different ministries like labour and veteran..." (HO, AH9) R: "Min of education...and USAID...and other NGOs, Yeah, Catholic aids action group...orphanage homes" (HO, AH8) R: "from me it's between constituency offices, regional, national level and database office." (HO, AH10) R: "...head office" (HOPM 11) R: "Court and regional offices" (WCO 12) R: Child life line and Women child protection unit (WCO 13).
Q: what information sharing arrangements does the ministry/department currently have in place? Provide a description of current information sharing activities. Q: How is information communicated form your desk to the next person inline?		Information sharing arrangements in place.	R: "...compile a report and submit to the chief clerk..." (CO,AH1) R: "Chief clerk, clients and I share information, sometimes you find a document is missing you call them." (CO, AH2) R: "files" (CO, AH2) R: "I draft a report or we communicate face to face or telephone" (CO, AH3) R: "sometimes we go to villages to identify OVCs, ...I use files " (CO, AH4) R: "Just monthly report" (CO, AH6) R: "platform previously called OVC forum but now it's called CCP" (CO, AH7) R: "we store information to generate reports regarding OVC, because we have a database." (HO, AH8) R: "social welfare grant system" (HO, AH9 & HO, AH10) R: "First we receive hard copies (referring to application forms), we approve and entered in the system and distribute the CD s to the regional officers and constituency officers and also our directors and deputy directors." (HO, AH10) R: "The CD has only the OVCs in the system but not deleted data...whenever there is data deleted they call as for enquiries. We attended a training last month (June/2011) for the scanning system to be implemented." (R: HOPM 11) R: "The ministry is working on the telephone lines, cell phones, and 3Gs" (WCO 12) R: "we use it to check if the clients applications were approved or not, checking in the CD"

			(WCO 14)
	Technology		
Q: Which ICTs are available to share information with colleagues in the department or office currently? Q: What kind of ICTs do you have at your constituency office?		ICT availability	R: "a PC ...a photo copy machine." (CO, AH1) R: "...received a computers recently, USB" (CO, AH2 R: a computers(CO, AH3) R: "... cell phones and now we received a computer. I use files" (CO, AH4) R: we have a telephone line, cell phone, PC (CO, AH5) R: "Cell phones" (CO, AH6) R: "I have a computer at the office" (CO, AH7) R: database application (naw wiki), computers, printer, photocopy, fax, external hard drive, USB (HO, AH8 & HO, AH9) R: "Usually hard copy, CD, USB...not much....internet, email," (HO, AH10) R: social welfare grant application, PC, printer, telephone lines (HOPM 11) R: "USB, computers, files, computer, printer and telephone line" (HO, AH12) R: computer, telephone, printer, USB and the fax (WCO 13) R: "PC and CDs and files" (WCO 14)
Q: What mediation technologies are used to share information between your office and other offices?		Storing and mediation technologies	R: "mobile phone" (CO, AH1) R: "Just phones" (CO, AH2) R: "nothing" (CO, AH3) R: "By telephone"(CO, AH5) R: "Nothing" (CO, AH6) R: database application (naw wiki), computers, printer, photocopy, fax, external hard drive, CD and files (HO, AH8 & HO, AH9) R: We use CDs and USBs and emails (HO, AH10) R: "we work with CDs" files and Telephone lines (HOPM 11) R: "In most cases our officers inform them via cell phones or telephones or announcement via community radio. We use the telephone other documents we convey hard copy" (HO, AH12) R: emails, telephone, and the fax (WCO 13)
Q: Which ICTs do you anticipate to effectively share information?		ICT use	R: "Internet maybe I think, there is a need to have telephone lines at all constituencies" (CO, AH1) R: "...telephone lines, printers, photocopies at constituency ..." (CO, AH2) R: "fax, printer, telephone and internet" (CO, AH3) R: "We use telephone; sometimes"(CO, AH4) R: "internet" (CO, AH6) R: "We need things like fax machine or telephone lines so we can communicate effectively" (CO, AH7) R: an information system linking regional offices (HOPM 11)

			R: "my work will be easy if we could communicate via email and telephones and cell phones or maybe a new mobile notification system" (WCO 12)
	People		
Q: currently, what do you think about the information sharing process? FQ: or state your views on the current information sharing process.		Information sharing perception	R: "I think sharing information is good. But it's currently it's not effective. I think there is a need to have telephone lines at all constituencies." R: "it's good but sometimes we receive information very late." (CO, AH2) R: information sharing "is very important...." (CO, AH3) R: "Information sharing is very important either within the work place or with the community for all to know what is going on. And if somebody needs something they will know where to find it" (CO, AH4) R: "It is good....we only need to have internet so that we can be more" (CO, AH6) R: "I want to say that the two weeks that I have been here...it is very effective..." (HO, AH8 & HO, AH9) R: "Sharing information...at the moment its ok, we don't have much problems...delays in delivery of files from regions" (HOPM 11) R: "I don't think the OVC information sharing processes is convenient to our clients because clients don't get information on time...they get it late or don't get it all." (HOPM 11) R: "It's a good thing...one learns a lot."(WCO 14)
Q: apart from the ICTs you currently use to share information (if any) which (other) ICTs are you able to use?		ICT perception	R: "Fax" R: can use "telephones, fax, photocopy machine [break] and cell phone." (CO, AH2) R: can use a fax (CO, AH4) R: "I use cell phones." knows how to use a computer. (CO, AH5) R: "Computer and the cell phone, faxes and photocopies" (CO, AH6) R: "which I have never used because I have never gone for training. But, I don't know." (CO, AH7) R: "Basically the computer and fax" (HO, AH10) R: can use computer, telephone, fax and photocopy (HOPM 11) R: "Of course the cell phone is major. It is more convenient" (WCO 12)
What skills do you need?		Skills needed	R: "The first thing we need is computer training [silence] and to be provided with telephone lines, printers, photocopies at constituency." (CO, AH2) R: "...computer training..." (CO, AH3) R: "we need a fax. We need computer training." (CO, AH4) R: "Maybe...we need to be...our computer to be connected to the internet" (CO, AH5) R: "we just need to have access to internet" (CO, AH6) R: "...I have never attended computer training." (CO, AH7) R: "...workshops time to time, but I think it should be more often for newly appointed staff members" (HO, AH10)

5.2.2 Data implications and elaborations

Step 4: Code all text: code a sample of data, check for consistency and revise coding rule as an interactive process. While new data continue to be analysed it is likely that new themes emerge. Researchers need to assess the coding rules until consistency is achieved. Step four was repeated as new themes emerged from the interviews as show in the table in step 3 (example: skills needed).

Step 5: Draw conclusion from the coded data. "This step involves making sense of the themes or categories identified and their properties" (Zhang & Wildemuth, 2009). Implications and elaboration were drawn from the responses provided.

Table 5.5 Implications and elaborations on interviews

Q: Question	Theme	Sub-themes	R: Responses	Implications and elaborations
Follow-up question: FQ,	**Environment**			
Q: Where the office is location? FQ: Is that a village or township?		Office location	R: "...Okaku village it's a constituency office."(CO, AH2) R: "Oshakati west" (CO, AH1) R: "Uuvudhia constituency, eengombe village" (CO,AH3) R: "I am at Omegee village, in oshakati east." (CO, AH4) R: "Omundja village, 30km from oshakati." (CO, AH5) R: "Uukwiyu-ushona." (CO, AH6) R: "... is located in Okatjali village." (CO, AH7) R: "In eros." (WCO 14) Q: what office is this? R: "This is database office." (HO, AH8) R: "I'm based at OPM." (HO, AH9) R: "...I read through the application, approve and from here it goes to or system data office". (HO, AH10)	In data collection, the environment where the CA offices are located was investigated to establish how it impact OVC registration information sharing process. Environmental factors influencing information sharing in chapter two were identified as presence of ICT vendors, digital divide. Due to low dispersion of electricity to rural areas implementation and utilization of ICTs is impossible. However, dispersion of electricity is not the only impediment. It appears from interviews that some constituencies have electricity yet, no ICTs (CO, AH7). Therefore, environmental factors influencing information sharing and adoption of ICT are comprised of geographical location of the office (such as rural or urban) and

			R: "...it's a subdivision of the ministry of gender but, it is here at the OPM." (HO, AH11)	basic infrastructure (electricity) needed to support the usage of ICT.
Q: Do you have electricity at your office?		Electricity availability	R: "...Not that [laughter] because I am at the rural area...there is no electricity." (CO, AH3) R: "...we have electricity". (CO, AH4) R: "Yes we do." (CO, AH5) R: "We have electricity but not ICT tools you are talking about." (CO, AH7)	
	Organisation			
Q: Are you aware of information sharing guideline document?		Information sharing guideline	R: "No, I'm not aware if there is any document..." (CO,AH1) R: "Sometimes . . .a memo" (CO, AH2) R: "No, I'm not aware of that." (CO, AH3) R: "...I'm...no" (CO, AH5) R: "No" (CO, AH6 & WCO 14) R: "I think that one you can get it from social workers...I think they have." (HO, AH8) R: "No, I am not aware of any guidelines" (HO, AH10) R: "No" (HOPM 11)	Interviewed candidates are not aware of an information guideline document in the department or the Ministry in general. Assumption such as "I think that one you can get from social workers" (HO, AH8) and "sometimes a memo" (CO, AH2) indicates that employees have no clue of the discussed document. However, some candidates answered directly that they are not aware of such a document.
Q: Who are your information sharing partners?		Stakeholder	R: "...other constituencies and the RO." (CO, AH1) R: "colleagues or supervisors ... and clients..." (CO, AH2) R: "colleagues and clients" (CO, AH3 & WCO 14) R: "organization . . . linked to the ministry like Yelula, CAFO we refer children's there." (CO, AH4) R: "I share with our clients, colleagues..." (CO, AH5) R: "community and colleagues at constituencies and at regional office." (CO, AH6) R: "We share information with different ministries like labour and veteran..." (HO, AH9) R: "Min of education...and USAID...and other NGOs, Yeah, Catholic aids action	There are several stakeholders involved in the activity. For the officer who approves applications for example, information sharing partners are databases officers, CA regional staffs and CA management (HO, AH10). "From here, information is shared "between constituency offices, regional, national level and database office" (HO, AH10). Constituency officers for instance share information with the regional officers and the community. "I share with clients and colleagues..." (CO, AH5). Interviewee CO, AH4 and WCO 12 stated that, "sometimes we go to villages to identify OVCs" and guardian or parent come to CA offices to apply for grant. Which

			group…orphanage homes" (HO, AH8) R: "from me it's between constituency offices, regional, national level and database office." (HO, AH10) R: "…head office" (HOPM 11) R: "Court and regional offices" (WCO 12) R: Child life line and Women child protection unit (WCO 13).	shows that external stakeholder's category includes the community and other mentioned organizations such as CAFO and USAID. Overall guardians, Community Childcare Workers, Record clerk, Data typist and Social workers are internal actors of the work activity.
Q: what information sharing arrangements does the ministry/department currently have in place? Provide a description of current information sharing activities. Q: How is information communicated form your desk to the next person inline?		Information sharing arrangements	R: "…compile a report and submit to the chief clerk…" (CO,AH1) R: "Chief clerk, clients and I share information, sometimes you find a document is missing you [redacted] (CO, AH2) R: "files" (CO, AH2) R: "I draft a report or we communicate face to face or telephone" (CO, AH3) R: "sometimes we go to villages to identify OVCs, …I use files " (CO, AH4) R: "Just monthly report" (CO, AH6) R: "platform previously called OVC forum but now it's called CCP" (CO, AH7) R: "we store information to generate reports regarding OVC, because we have a database." (HO, AH8) R: "social welfare grant system" (HO, AH9 & HO, AH10) R: "First we receive hard copies (referring to application forms), we approve and entered in the system and distribute the CD s to the regional officers and constituency officers and also our directors and deputy directors." (HO, AH10) R: "The CD has only the OVCs in the system but not deleted data…whenever there is data deleted they call as for enquiries. We attended a training last month (June/2011) for the scanning system to be implemented." (R: HOPM 11) R: "The ministry is working on the telephone lines, cell phones, and 3Gs" (WCO 12)	Information sharing arrangements between CA staff members includes monthly reporting, CD, telephone communications and meetings. The department shares reports and statistics with external stakeholder via the ministerial reports and the Nam wiki web site. The department has a data warehouse office (HO, AH8) where statistics are entered into the database and reports are generated and accessible to external stakeholders via the: http://www.namchild.gov.na website. The key information sharing arrangement in place between two administrative levels (National and regional) at the time of this study is a CD with monthly pay-out data a copy is forwarded to all regional offices. Additional enquiries regarding monthly pay-out are done via the telephone lines. Stated by the HOPM 11 the MGECW, child allowance division in particular has information sharing arrangements in the pipeline, to improve the work activity process. Scanning technologies are considered for OVC

			R: "we use it to check if the clients applications were approved or not, checking in the CD" (WCO 14)	
	Technology			
Q: Which ICTs are available to share information with colleagues in the department or office currently? Q: What kind of ICTs do you have at your constituency office?		ICT availability	R: "a PC ...a photo copy machine." (CO, AH1) R: "...received a computers recently, USB" (CO, AH2 R: a computers(CO, AH3) R: "... cell phones and now we received a computer. I use files" (CO, AH4) R: we have a telephone line, cell phone, PC (CO, AH5) R: "Cell phones" (CO, AH6) R: "I have a computer at the office" (CO, AH7) R: database application (naw wiki), computers, printer, photocopy, fax, external hard drive, USB (HO, AH8 & HO, AH9) R: "Usually hard copy, CD, USB...not much....internet, email," (HO, AH10) R: social welfare grant application, PC, printer, telephone lines (HOPM 11) R: "USB, computers, files, computer, printer and telephone line" (HO, AH12) R: computer, telephone, printer, USB and the fax (WCO 13) R: "PC and CDs and files" (WCO 14)	Tradition ICTs are available at all administrative level. The extant of ICTs at the three levels varies. Interviewees (HO, AH12; HOPM 11; HO, AH10) at head offices lists more ICTs available than the constituency and regional interviewees. Already, the difference in terms of ICTs emerged in the ways of information sharing between offices. Communication between constituency officers and regional officers is done via cell phones, meetings or drafted internal memos (CO, AH4; CO, AH5; CO, AH6). Furthermore, regional offices are equipped with photocopies, faxes, computers, a 3G and monthly data for grant recipients in a CD (WCO12 & WCO 14). CDs are ICTs frequently used at regional level. Information on a CD is extracted from the Social welfare system based at head
Q: What mediation technologies are used to share information between your office and other offices?		Storing and mediation technologies	R: "mobile phone" (CO, AH1) R: "Just phones" (CO, AH2) R: "nothing" (CO, AH3) R: "By telephone"(CO, AH5) R: "Nothing" (CO, AH6) R: database application (naw wiki), computers, printer, photocopy, fax, external hard drive, CD and files (HO, AH8 & HO, AH9) R: We use CDs and USBs and emails (HO, AH10) R: "we work with CDs" files and Telephone lines	

			(HOPM 11) R: "In most cases our officers inform them via cell phones or telephones or announcement via community radio. We use the telephone other documents we convey hard copy" (HO, AH12) R: emails, telephone, and the fax (WCO 13)	
Q: Which ICTs do you anticipate to effectively share information?		Anticipated ICT needs	R: "Internet maybe. I think, there is a need to have telephone lines at all constituencies" (CO, AH1) R: "…telephone lines, printers, photocopies at constituency …" (CO, AH2) R: "fax, printer, telephone and internet" (CO, AH3) R: "We use telephone; sometimes"(CO, AH4) R: "internet" (CO, AH6) R: "We need things like fax machine or telephone lines so we can communicate effectively" (CO, AH7) R: an information system linking regional offices (HOPM 11) R: "my work will be easy if we could communicate via email and telephones and cell phones or maybe a new mobile notification system" (WCO 12)	Despite overwhelming descriptions of available ICTs, stakeholders in the OVC registration process have information needs that have to be satisfied. Contrast with the available ICTs interviewees listed ICTs anticipated capable to effectively facilitate information sharing between offices. Information sharing need differ depending on the location of the office. This is clearly stated by employees when asked what ICTs they anticipated to effectively share information (CO, AH1; CO, AH2; CO, AH3 and CO, AH7). Most employees know how to use ICTs such as faxes and telephones are not available at constituency level.
	People			
Q: currently, what do you think about the information sharing process? FQ: or state your views on the current information sharing process.		Information sharing perception	R: "I think sharing information is good. But it's currently it's not effective. I think there is a need to have telephone lines at all constituencies." R: "It's good but sometimes we receive information very late." (CO, AH2) R: information sharing "is very important…." (CO, AH3) R: "Information sharing is very important either within the work place or with the community for	Employees value the concept of information sharing; nevertheless, the current information processes are not effective. Inefficient could be linked to factors previously discussed (environmental, organizational and technological issues). CO, AH2, HOPM 11 stated that "information is received very late" at constituency level and that,

			all to know what is going on. And if somebody needs something they will know where to find it" (CO, AH4) R: "It is good....we only need to have internet so that we can be more" (CO, AH6) R: "I want to say that the two weeks that I have been here...it is very effective..." (HO, AH8 & HO, AH9) R: "Sharing information...at the moment its ok, we don't have much problems...delays in delivery of files from regions" (HOPM 11) R: "I don't think the OVC information sharing processes is convenient to our clients because clients don't get information on time...they get it late or don't get it all." (HOPM 11) R: "It's a good thing...one learns a lot."(WCO 14)	"the current information sharing process is not efficient to clients". Clearly the division needs to consider means of communicating with clients as well. At head office, information sharing among employees is described efficient (HO, AH8; HO, AH9 & HOPM 11).
Q: apart from the ICTs you currently use to share information (if any) which (other) ICTs are you able to use?		ICT use perception	R: "Fax" R: can use "telephones, fax, photocopy machine [break] and cell phone." (CO, AH2) R: can use a fax (CO, AH4) R: "I use cell phones." knows how to use a computer. (CO, AH5) R: "Computer and the cell phone, faxes and photocopies" (CO, AH6) R: "which I have never used because I have never gone for training. But, I don't know." (CO, AH7) R: "Basically the computer and fax" (HO, AH10) R: can use computer, telephone, fax and photocopy (HOPM 11) R: "Of course the cell phone is major. It is more convenient" (WCO 12)	CA employees interviewed possess ICT skills to operate with mobile technology and most of the traditional ICTs (fax machine, telephone and photocopy). Further enquiries on the ICTs present at different CA lead to interviewees to telling the skill they wish to advance. Interviewed constituency officers further indicated a need for computer training (CO, AH2; CO, AH3 & CO, AH7).
FQ: What skills do you need?		Skills needed	R: "The first thing we need is computer training [silence] and to be provided with telephone lines, printers, photocopies at constituency." (CO, AH2) R: "...computer training..." (CO, AH3) R: "we need a fax. We need computer training."	Computer skills are required for the officers to effectively use ICTs.

			(CO, AH4) R: "Maybe…we need to be…our computer to be connected to the internet" (CO, AH5) R: "we just need to have access to internet" (CO, AH6) R: "… I have never attended computer training" (CO, AH7) R: "…workshops time to time, but I think it should be more often for newly appointed staff members" (HO, AH10)	

Step 6: report your methods of findings. Step six suggests that the researcher should report practices concerning the coding process supported by the descriptions and interpretations to provide the reader with an understanding of the phenomenon (Zhang & Wildemuth, 2009).

Data coding is based on the TEOP dimensions identified in chapter two. Sub themes further emerged as the data analysis continues and content analysis steps outlined above are repeated. To determine the implication of responses, additional descriptions in different colours were added. Response implications are classified as follows; the green colour is used where by the respondent knows for sure, therefore the positive response given affirms the question. Red colours apply to responses pointing out what is hampering effectiveness of information sharing. The purple colour applies to vague responses given, e.g. a respondent indicate that she knows how to use a computer but could not further divulge which software applications she is familiar with. 'Not sure' responses were also given, whereby the respondent is not confident about the matter in question.

5.3 Organization and information sharing purposes

Section A of the interviews focused on organization and information sharing needs. Interviews and document reviews yield the best information to complete this section. Interviewees were asked to describe their work activity, to state its purpose and to name the stakeholders. Efforts were made to find out if the organization has an information sharing policy in place. The questions in all sections were aimed at realizing the objectives of the study, as indicated in table 5.1, about the organization, its information sharing purposes and its use of ICTs.

5.3.1 Description of the work activity and the actors

From both the participants and the document review, it is evident that the OVC grant registration business activity is taking place at all three governing levels. There are several stakeholders involved in the activity. For the officer who approves applications for example, information sharing partners are database officers, CA regional staff members and CA management. One interviewee stated that, information is shared "between constituency offices, regional, national level and the database office" (HO, AH10). Constituency officers for instance share information with the regional officers and the community. "I share with clients and colleagues..." (CO, AH5). Depending on the grant the OVC or guardians are seeking (see appendix C) and the office functions and location, information sharing partners and stakeholders vary. The purpose of the activity is to identify OVCs and register them for grant benefits. Interviewee CO, AH4 and WCO 12 stated that, "sometimes we go to villages to identify OVCs" and the guardian or the parent comes to the CA offices to apply for the grant.

Community childcare workers are government employees based at constituency level and are the ones that identify the OVCs. Most of the constituencies are villages or informal settlements and community childcare workers serve as mediators between the ministry as an organization and the community. They identify the OVC and encourage them with grant registration applications. Community childcare workers do not endorse or recommend any application for a grant. Instead, the Records Clerk and Social Workers at regional offices support applications for grants and forward the documentation files to head office for approval.

Guardians, Community Childcare Workers, Records Clerk, Data typist and Social workers are internal actors of the work activity. Grant services are optional because applicants have different criteria. Appendix D contains types of grants and qualified applicants. Organizations such as the Ministry of Health Services, the Ministry of Justice (through the court), the Ministry of Education, the Woman and Child Protection Unit and non-governmental organizations like the Catholic AIDS action group are external stakeholders in this activity (HO, AH8; WCO 13 and HO, 19).

The registration process at head office is spearheaded by Social workers, Control officers and Data typists. Staff members are responsible for registration, providing psychological needs, approving applications and entering information into the Social Welfare Grant System (SWGS). Unsuccessful applications are sent back to the regional offices while the details of successful candidates are added to the SWGS. After every pay-out, which happens every month, a CD with grant beneficiary information is sent to each region. The interviewee explained that applications are received, approved, verified and entered in the social welfare grant system. A CD containing grant recipients is distributed to the regional officers and constituency officers and also to directors and deputy directors (HO, AH10).

Applicants can make further enquiries at the regional office. For verification purposes, staff members at regional offices check if the enquirer's details are part of the data provided on the CD. If the applicant's details are not on the CD, it means that the application was not approved or that the beneficiary was deleted from the system, due to other reasons. Applicants, constituency officers and regional officers can only find out such reasons, or whether or not applications were submitted, from head office officials by making a landline telephone call. Successful applicants can also be informed by an announcement on the radio.

5.3.2 Information sharing arrangements

Information sharing arrangements between CA staff members include monthly reporting, CD, telephone communications and meetings (CO, AH1; CO, AH3 & CO, AH6). The department however shares reports and statistics with external stakeholders via the ministerial reports and the Nam wiki web site. The department has a data warehouse office (HO, AH8) where statistics are entered into the database and reports are generated which are accessible to external stakeholders via http://www.namchild.gov.na website. The key information sharing arrangement in place between two of the administrative levels (National and regional) at the time of this study, is a CD with monthly pay-out data, a copy of which is forwarded to all regional offices via a courier. It was established that MGECW, has information sharing arrangements in the pipeline, for the child allowance division in particular, to improve the work activity process. The division is considering using scanning technologies with the aim of enabling the following (MGECW BPR, 2011):

- Data capturing at regional level;
- Verification and electronic signature of applications;
- Certification and approval of application electronically at national level.

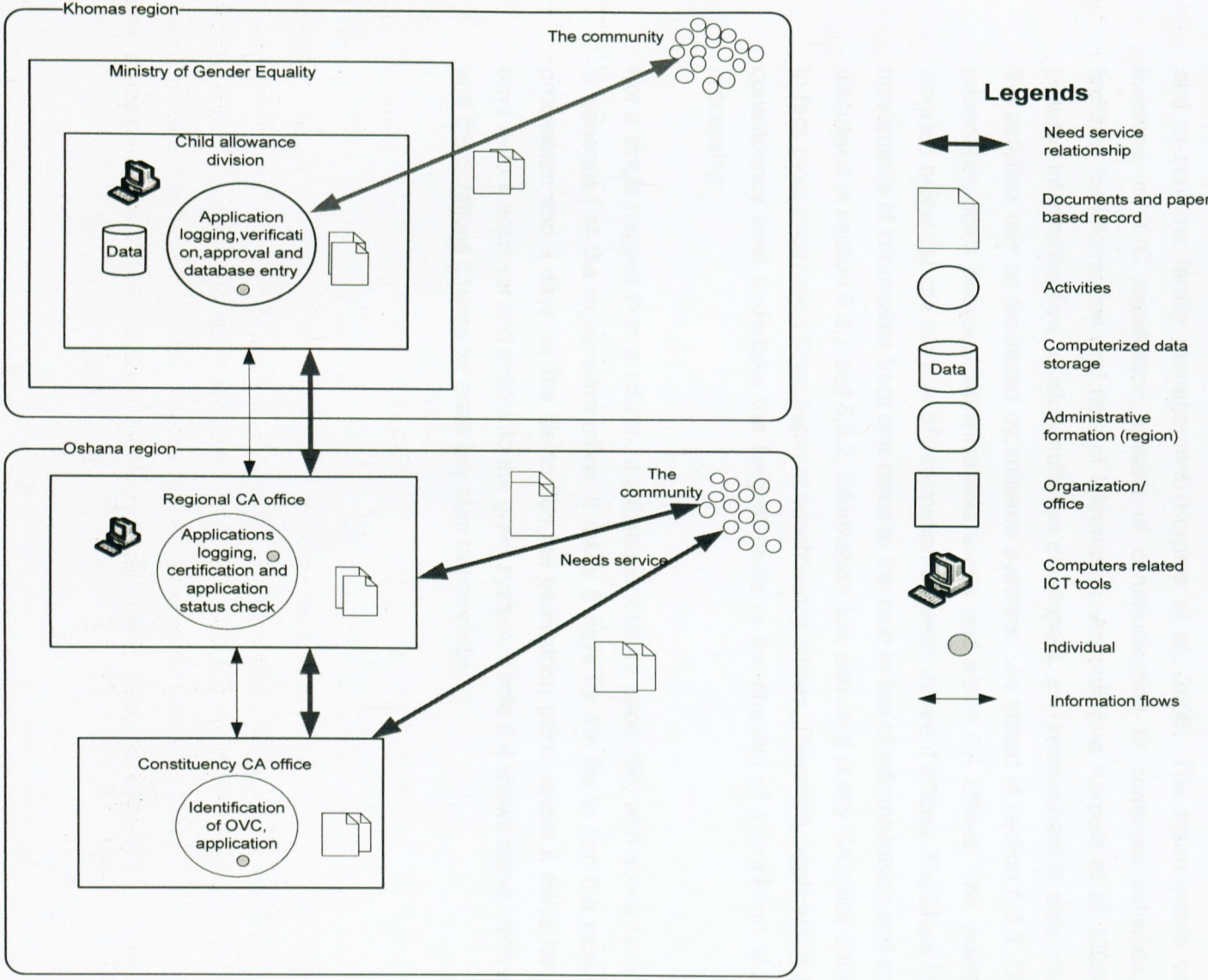
Regional level officers will then be able to download and view the information related to the application status as well as application forms. Applications and attached documents will be scanned at all regional offices and uploaded directly into a computer based grant application system.

5.3.3 Flow of services between departments

Using legends provided in figure 4.4, the flow of services between the departmental offices at the three levels is illustrated in figure 5.1. The constituency offices are at the lowest administrative level in the Namibian government, and closest to most rural areas.

Figure 5.1 also shows CA offices targeted in this study. In the figure, squares show offices at different administrative levels. Big circles in squares represent different tasks carried out to complete the registration work activity. Smaller circles represent individuals seeking services at offices, or individuals carrying out the work activity. Blue solid lines represent the need for service relationship between the community and offices. The flow of service between organizations recognize looking into what the activity is about, identify where people can receive services for their needs, pointing out different localities of organizations while service needs connect people or an activity with activities (Korpela *et al.*, 2008) as shown in figure 5.1. While thin black lines (discussed in section 5.3.4) show the flow of information between CA offices.

Figure 5.1 OVC registration-flow of service within department of Child Allowance



Legends

- Need service relationship
- Documents and paper based record
- Activities
- Computerized data storage (Data)
- Administrative formation (region)
- Organization/ office
- Computers related ICT tools
- Individual
- Information flows

Channels for the flow of services between CA departments:

a) Individual – constituency office – to regional office – to head offices
b) Head office – regional office – constituency – individual
c) Individual - regional office - head office
d) Head office - regional offices- individual
e) Individual – head offices – individual

5.3.4 Information flows

The idea behind the information flow diagram is to identify information management activities and to consider facility management (Korpela *et al.,* 2008). The figure points out events involved in OVC registration, means of communication to complete activities, storage facilities for information and flow of information. According to Korpela et al. (2008) ADNA pictures information flow to allow software developers, and researchers to determine where the activities can be facilitated by software systems. As stated in section 5.3.3, OVC grant information flows between administrative levels and within CA offices. The swimming line diagram below depicts the flow of information between different offices. The black lines show movements of information from one office to the next in line of administration and processing discussed in section 5.2.1 and 5.3.2. Information flow can start at any CA office country wide. In fact, most information flows begin at constituency offices. Therefore, applications logged at constituency level undertake the longest route in the channel of information sharing and processing.

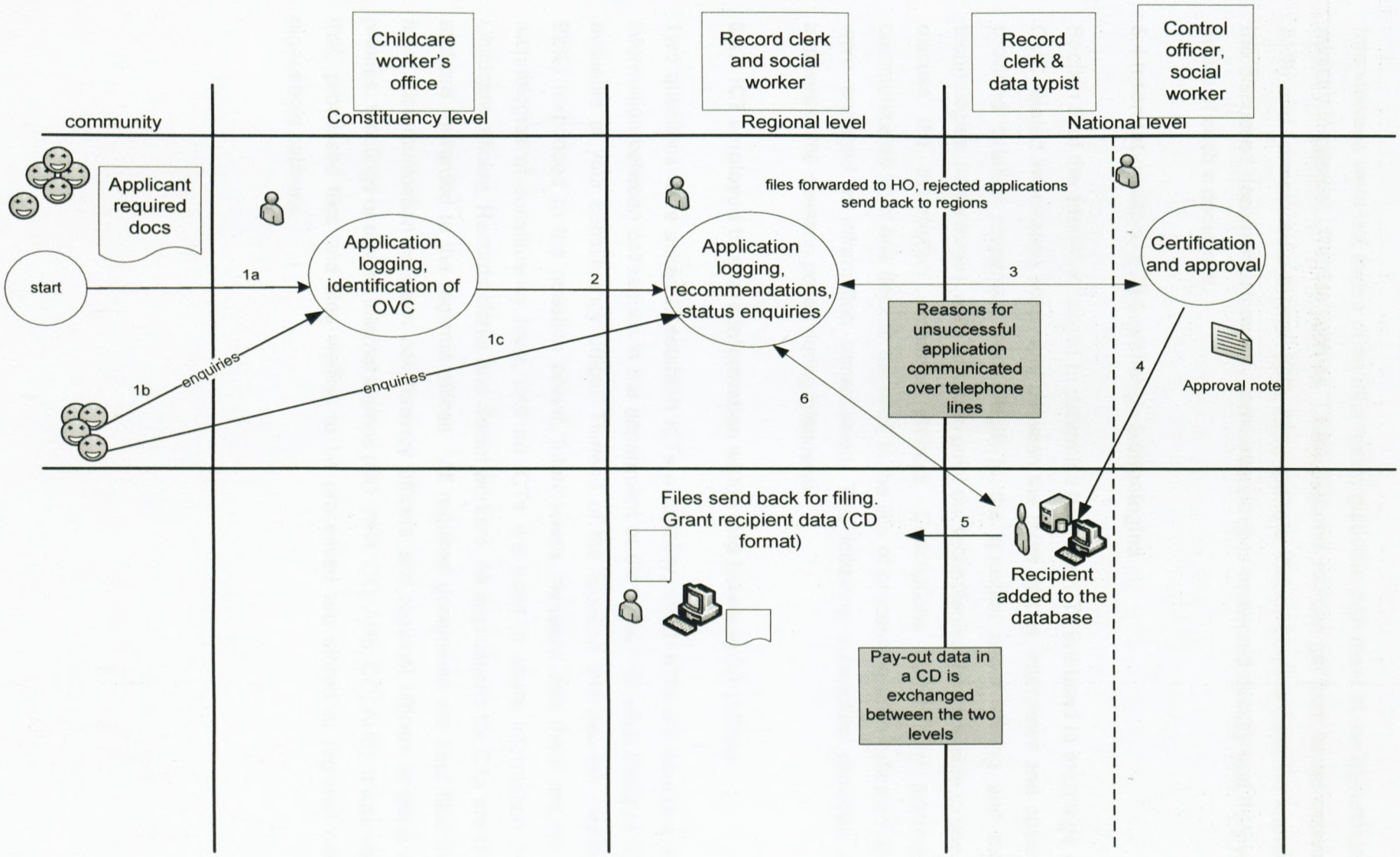
For a single request from a citizen, a subsequent file (a paper file) with about 12 documents is generated at the registration office. It takes 6 days for the file to rich the next office for procession and 9 days for the file to rich the verification point, where it stays for about 60 days before approval and entry into the grant system. Table 5.4 shows steps involved, actors and the durations it takes for each key step to complete.

Table 5.6: OVC registration steps, actors and durations. Source: information sharing interviews, 2011

	Key steps	Who's responsible?	Duration
1	Applications come to constituency office application form completed as per information provided by client/applicant	Community child care worker / applicant	5 days
2	Fill in dispatch list & parcel applications and submit them to regional office for checking.	Community care worker/ applicant	1 day
3	Check completed application forms for correctness	Chief clerk	4 days
4	Parcel all application forms for dispatch to national level and prepare waybills.	Chief clerk	1 day
5	Applications collected & delivered to addressee	Courier service	2 days
6	Applications collected & delivered to addressee	Clerical assistant	2 days
7	Application forms forwarded for verification and approval	Control officer	60 days
8	Approved applications forwarded for entry into system	Data typist, chief clerk OPM	15 days
9	Authorisation & printing of payment requests	System administrator	1 day
10	Preparation of general expenses to finance department	Chief Control Officer/ Director	1 day
11	Payment request checked for funds availability and recommendations	Financial advisor, Deputy Director finance, Permanent Secretary	1 day
12	Payment request forwarded to Ministry of finance for funds transfer	Ministry of Finance paymasters	5 days
13	Payment / collection of grants	Paymaster/clients	15 days
14	File review for monitoring purposes	Chief Control Officer	15-30 days
	Total duration		**3-4 months**

The information sharing process involves ICTs at some offices but paper files dominate the process. In the case of OVC registration information flows, the diagram shows that ICTs, specifically information systems, are only available at National level (Khomas-head offices). At regional level, PCs are available to access the information on a CD. The next subsection discusses the role played by ICTs in the OVC registration process.

Figure 5.2 Swimming lane diagram – information flows between CA offices



5.3.5 Information sharing guideline

Interviewees were not aware of an information guideline document in the department or the ministry in general. Replies such as "I think that one you can get from social workers" (HO, AH8) and "sometimes a memo" (CO, AH2) indicate that employees have no knowledge of the discussed document. However, some interviewees answered directly that they were not aware of such a document.

5.4 Information storing and exchange technologies

Section B of the interviews aimed to determine how the ICTs are used to exchange or store OVC related information within and between the three offices. Interviews and observations provided detailed responses and insight to the question about storing and mediation technologies. Interviewees were asked to point out technologies they are able to use, and to discuss the information exchange process. Descriptions about how information is communicated from one desk to the next, in the line of processing, also indicated how ICTs were engaged in information transmission. The following subsection provides detailed answers to the question posed during interviews.

5.4.1 ICT employed to share information within and between CA offices

Two questions were asked to establish ICTs availability; which ICTs are available to share information between colleagues in the department or the office? Or what kinds of ICTs are available at your constituency office? Thirteen of the fourteen interviewees (representing 92%) responded to the question posed. Interviewees indicated that there are no storing technologies at constituency level, and no ICTs are used to share information between Childcare officers, Records clerks and Social workers. All applications for CAs are on paper and are forwarded to the regional offices. All required documents are kept filed in paper form. Communication between constituency officers and regional officers is done via cell phones, meetings or drafted internal memos (CO, AH4; CO, AH5; CO, AH6). It was observed that, processed files and files waiting to be processed are stored at regional offices in pigeonhole cabinets.

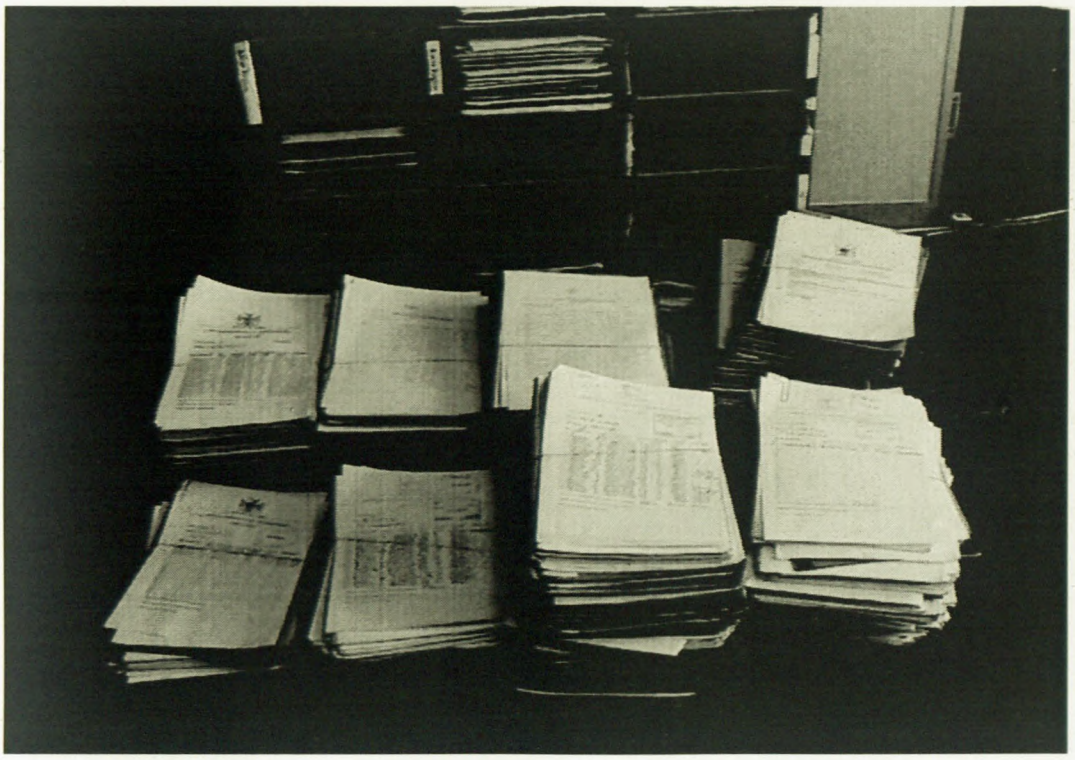


Figure 5.3 OVC application forms (taken at MGECW during data collection process)

Furthermore, regional offices are equipped with photocopies, faxes, computers, a 3G, cell phone and monthly data on grant recipients on a CD (WCO12 & WCO 14). The information on the CD is extracted from the Social welfare system based at head office.

It appears that in terms of ICT usage and availability, information sharing process in and between the regional office and head office and vice versa is relatively good, compared with that in the constituency and regional offices. The difference in terms of the availability of ICT equipment is an illustration of the digital divide that exists between rural and urban areas. The Social Welfare Grant System (SWGS), web application (NamWiki) and a data warehouse (Namibia Orphans and Vulnerable Children database) are available and accessible to officials at head office. Manually recommended and approved applications are entered into the SWGS shared between three ministries, the Ministry of Gender, the Ministry of Veterans and the Ministry of Labour (HO, AH9 & HO, and AH10). These ministries support grant services to different groups of the needy. The SWGS is an Inter-departmental Information Management System (IIMS) for grant services offered by different government ministries, based at the OPM. Overall, ICTs such as PC, laptops, scanners, USB, external hard drives, printers, CDs, radio, and cell phones are available and useful to perform the work activity. Listed mediation and storing technologies (Table 5.1) are available at MGECW, CA division. Constituency officers indicated that they have computers but these are not being used due to lack of skills or basic infrastructure, in particular a reliable source of electricity.

Table 5.7 Mediation and storing technologies. Source: information sharing interviews, 2011

Storing and mediation technologies			
	Constituency	**Regional**	**Head office**
Personal computers	√	√	√
CD		√	
Cell phones	√		√
Telephone lines		√	√
fax		√	√
e-mails			√
Internet (3Gs and wired connections)		√	√
Databases			√
Web application			√
External devices (USB & hard drives)		√	√

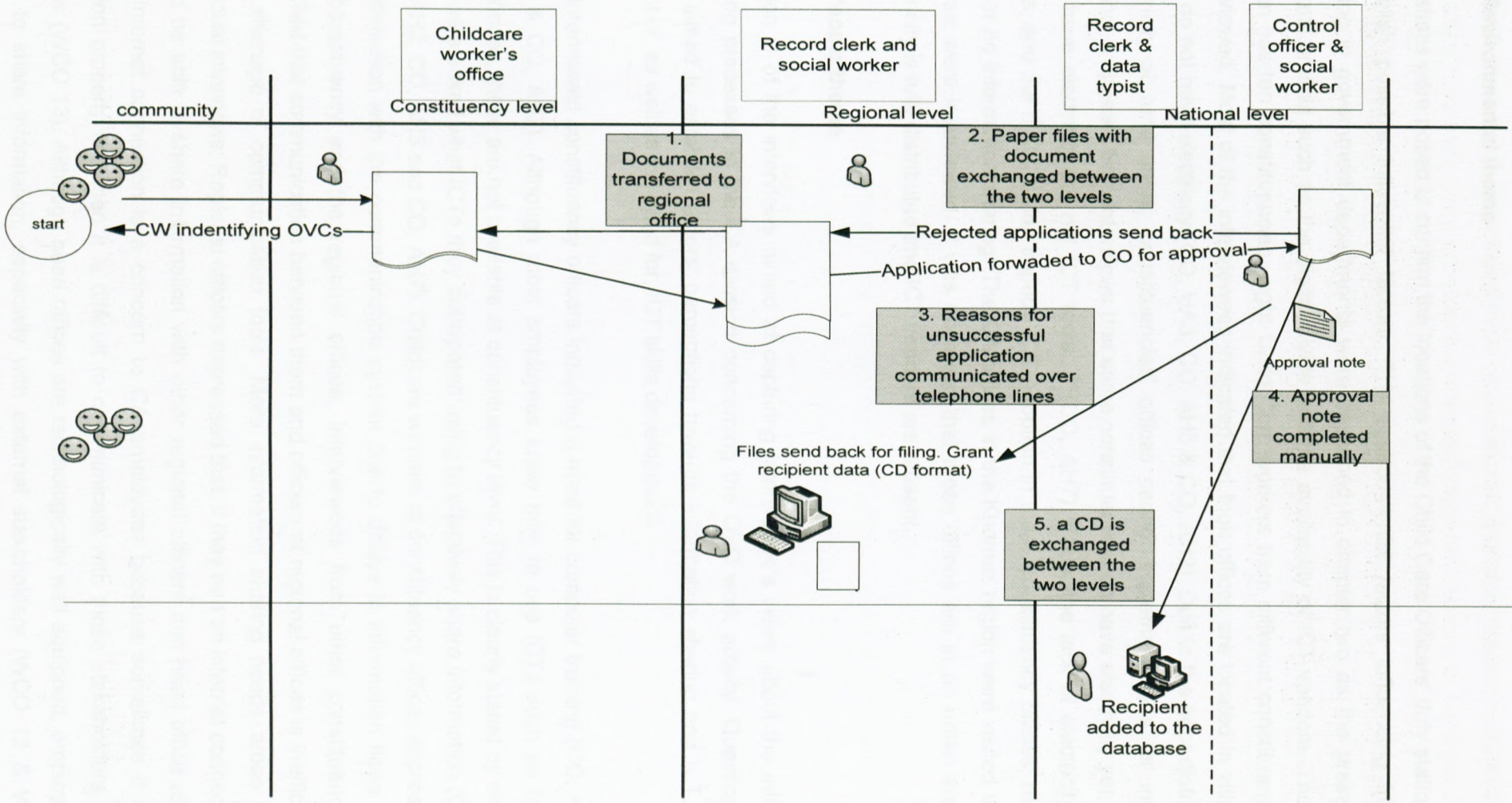
5.4.2 ICT needs

The following ICT needs surfaced from the interviews:

- There is a need for a computer information system to manage OVC registration information and to transfer information between all offices.
- All constituency officers interviewed indicate that there is demand for computer skills development.
- Participants in regional and head office administrative positions indicated a need to have access to the internet and emails. Although computers are available at some offices, only a few are functioning properly while some are underused due to lack of skills among employees and poor distribution of electricity. Using the ADNA technique, the activity information flows are shown in figure 5.1 swimmlines. Given the drawing and the ICT needs that surfaced from interviews, it is practical to find out where the OVC registration process is manually performed and whether or not it can be facilitated by ICTs, specifically information systems.

The yellow square boxes (if colour is applicable) in figure 5.3 highlight where information is processed and exchanged manually and could be done in an electronic way. There is a need to implement Information Systems to enable exchanging, and processing of information at the highlighted areas. The Information sharing and organizational needs, discussed in section 2.4 are about the adoption of information systems. According to Ebrahim & Irin (2005: 594), e-government information sharing depends, to a significant extent, on existing government information and processes. Electronic systems can assist in managing government records. However, the presence of electronic information systems does not necessarily provide a solution to problems of information bureaucracies. Success will only be achieved from appropriate implementation and management of information systems. There are a large number of OVC applications in the department of CA. Therefore, government departments need to integrate their information systems and web applications in order to share information within and between departments.

Figure 5.4 Swimming lane diagram – Possible electronic information exchange



5.5 Environmental theme

Questions were posed to confirm the locations of the Child Care Officers' duty stations and to establish possible influential factors. The environmental factors influencing information sharing in government departments were described in chapter two as the pressure from external entities such as the digital divide and the availability of ICT vendors. The Oshana region has ten constituencies; eight Child Care workers from different constituencies were interviewed. Most of the interviewees indicated that their offices are located in villages and they do not have electricity (CO, HA3; CO, AH5 & CO, AH2). Due to the poor distribution of electricity at rural areas, constituencies' offices cannot implement ICTs for information sharing. It appears from interviews that some constituencies do have electricity yet, no ICTs. "We have electricity but not ICT tools..." (CO, AH7). Thus, the lack of electricity in rural areas, and the digital divide impede ICT adoption in these constituency offices, resulting in little or no information sharing. The CA offices in the Khomas region were visited and some officials were interviewed. It was observed that these offices are in an urban area where electricity is fully distributed and ICT vendors are present.

5.6 People theme

Section C of the interviews aimed at capturing interviewee's views about the information-sharing processes in the CA division concerning the OVC work activity. Questions posed also aimed to establish actors' perceptions towards information sharing and ICT, and the extent of, as well as the need for, ICT skills development.

The interviewed constituency officers indicated a need for computer training (CO, AH2; CO, AH3 & CO, AH7). Although most employees know how to use ICTs such as faxes and telephones, these are not available at constituency level. This is clearly stated by employees who were asked what ICTs they anticipated using to effectively share information (CO, AH1; CO, AH2; CO, AH3 and CO, AH7). Childcare workers at constituency offices expressed their dissatisfaction with the communication system due to delays in information flows between the constituency and the regional offices. Interviewees from other constituencies also specified that communication between them and officers at regional offices is inefficient, due to a shortage of communication tools. More information sharing needs arose from the individual interviews: Regional officers expressed that, if they had an internet connection they would be able to share information with other regional officers and head office effectively. The Internet connection is a concern to CA employees because sometimes it does not function properly and then it is difficult to communicate with those stakeholders who use emails (WCO 13). Although head offices are technologically well equipped, employees who need to share information, especially with external stakeholders (WCO 13 & WCO 12)

cannot do so. It is clear that employees are willing to share information using ICTs such as the Internet, telephone, and fax machines. However, these ICTs are not available.

5.7 General observations

The researcher visited CA offices in the targeted regions to monitor the OVC registration activity. It is observed that:

- Most constituency offices are located in rural areas and do not have electricity. Therefore, ICT tools cannot be active at constituency level. This result in enquiries about OVC applications only being feasible at regional offices, where a CD containing beneficiary information can be accessed. Applicants have to travel to regional offices to make enquiries.
- Occasionally, the community radio service is utilized to announce the approved applications.
- Although computer tools are available at regional offices, such tools are not employed in the OVC registration process. The whole registration process is handled manually.
- It is observed that the department has two data warehouse systems. The Namibia Orphans and Vulnerable Children database was designed and implemented during the 2007/2008 financial year. The mySQL data warehouse has not been in use since implementation in 2008 due to technical and logistic problems ranging from access to the server site to server configuration. The Nam Child Wiki is the second data warehouse in the department of CA and is currently in use.

5.8 Information sharing efficiency / inefficiency

As discussed in chapter two, effectiveness and efficiency of electronic information in organizations is influenced by different factors that lead to the achievement of benefits associated with information sharing. Scant enactment of such factors leads to a lack of information sharing within any organizations. The literature points out that there are technology, organizational, people and policy related information sharing contributing factors. These factors were aligned to the carefully chosen (TOE) underpinning theory in chapter three in order to form an information sharing effectiveness model TOEP (the underpinning theory focused on how organizations acquire and implement technological innovations). TOEP aims to assess information sharing effectiveness in government departments. The conceptual model's contexts are inter-related, meaning a lack in one context leads to failure in the other contexts. Relating the derived conceptual model to the work activity of registration presented above reveals the following. There are technological, organizational, and environmental and people related factors inhibiting the effectiveness of information

sharing within the CA department, leading to information sharing needs in the areas of organisation, technology and people at the time this study was conducted.

3.4.1 Application of TOEP to information sharing studies

The dimensions are related to this case study. It is important to explain how TOEP dimensions applies to information sharing, focused on the work activity of Orphans and Vulnerable Children's OVC registration. This OVC registration activity is taking place in the Child Allowance CA division of the Ministry of Gender Equality and Child Welfare services, located at three governing levels (national, regional and constituency).

According to OPM (Namibia OPM 2005), the IT policy was formulated in 1993. The IT policy allows different government ministries to acquire information technology units, which assists in the implementation of plans and of various applications at ministerial levels. The division is responsible for the drawing up of ICT related bid submission, tender evaluation, for the support of complex systems design, and for managing and maintaining computer systems for the day to day operation of the ministry (Namibia OPM, 2005). The policy states that "the Namibian government developed an IT policy governing and guiding the use of ICT tools, application and use in government ministries". This signifies an environmental and organizational context where information sharing is taking place supported by the ICT experts and policies. Therefore, the four contexts (TOEP) are assumed here to enable information sharing according to the OPM idea of ICT use and the disposition of IT units in government organizations. The extent to which the department of CA uses ICT tools, to processes and share information between the three governmental levels, demonstrates the technological and environmental conditions of this study. It is assumed that the OVC registration process is initiated by the guardian of OVCs and handled by different agents who also define the background needs of the people. Guardians request for registration services at the nearest CA office where procedures for obtaining grants are available and applied; this further indicates the need for people, organization and environment contexts.

Section 5.3.2 narrates the technological needs within the department. The availability of ICTs at the three administrative levels ranges from existent to minimal. The department lacks the necessary ICT tools in the process of OVC registration at constituency level, absence of telephone lines between the constituency and regional offices is such an example. Although the acquisition of ICTs is done by the ministerial IT office under the directive of DPSITM, in the office of the Prime Minister, the allocated budget is not sufficient to acquire the necessary ICTs. The department relies more on donor funds for necessary ICTs. This is clearly visible as the Nam wiki website and the NOVC database are both donor funded initiatives.

The study observed that the CA Head Offices in Khomas are more ICT oriented than the other offices. The contrast that exists between the head and regional offices, regarding the availability of ICTs, is an example of the digital divide. Evidence of this is the availability of mobile phones as the main means of communication between regional and constituency officers, and the lack of basic infrastructures such as electricity to enable ICT implementation. Several constituency offices do not have electricity. Therefore, to have ICT functioning at such locations is almost impossible. Employees believe that the presence of ICTs, such as an email service, could simplify OVC grant related information sharing processes. There is a need for ICT skills development in the division. Employees expressed a need for computer training, specifically. Information sharing needs in the department of CA is clearly diverse. The table below summarised information sharing needs in the CA department, according to the TOEP contexts.

This study noted that the CA department does not have any information sharing guidelines. None of the interviewees have any knowledge of an information sharing guideline in the department or organization in general. The frequently used means of communication in the department are cell phones, telephones, staff meetings and the circulation of internal memos. Cell phones and telephone lines are the fastest way of communicating. However no record is kept of conversations, which might lead to inaccurate information sharing. Therefore, there is a need for an electronic information system to share information. The methods of communicating, such as forwarding paper files, results in delays in the transfer of information between the main , regional and constituency offices, irrespective of the origin and destination. All these factors cause the process of information sharing to be inefficient.

5.10 Chapter summary

In this chapter, findings from interviews, observations and document analysis were discussed. The work activity in the CA division is to register the OVC on a government grant scheme. An ADNA approach is used to display information flows within the CA divisions in different settings and the discussions are based on the content analysis results. Although guardians are external stakeholders in this activity, Community Childcare Workers, Record clerks, Data typists and Social workers are internal actors of the work activity.

It is reported that paper files containing OVC applications and other required documents are exchanged between constituency, regional and head offices. Files are stored in cabinets at

regional offices and only approved applicant's details are added to the social welfare allowance database system situated at the head offices in Khomas.

More ICTs are available at the head offices than at the regional and constituency offices. Telephone lines, cell phones and CDs are reported as the common ICTs' enabling information sharing between the three levels. Therefore, the use of ICT in this work activity is trivial.

There is a need for information systems to replace paper files, cabinets and monthly CDs at all levels of the administration. The ministry planned to improve information sharing systems by introducing scanning technologies.

Table 5.8 Barriers to the efficient sharing of OVC information

Technological	Organizational	Environmental	People
ICT infrastructures	Information sharing guideline	Digital divide	ICT skills
ICT tools (IS, telephone lines, fax, photocopy machines, internet, computers etc)	ICT initiative funds	Basic infrastructures to enable ICT implementation (electricity)	perception

Recommendations to the research findings about identified information sharing needs in the CA division, and information sharing effectiveness in the associated government departments in general are reported in Chapter six.

CHAPTER 6
CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter present the summary of the research findings and conclusion drawn from literature and the conducted interviews. The study focused on establishing information sharing influential factors and sharing of information in government departments, a case study was picked from the Namibian government, department of Child Allowances. Findings from literature and the case study were discussed and based on how they address research objectives. Recommendations, significance of the study and limitations are disclosed in this chapter. The chapter concludes the research study by providing on overview of the study.

6.2 Research Objectives

The focal point of the study was to explore information sharing processes in a government department in order to establish possible factors that influence information sharing and needs. It was stated in chapter one that information sharing needs for government departments are not explored and there is paucity of data related to government departments information sharing. In order to address the research objective, research questions are answered by secondary and primary sources of data consulted. Also to get a better understanding of information sharing in government departments and to validate the conceptual model derived in this study, the CA department's OVC registration activity is explored. The research objectives of this study are achieved and summarised in table 6.1.

Table 6.1 research objectives, question and findings

Objective	Question	Findings
Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government.	What are the information considerations of service provision by the CA department?	Innovations such as IS, internet, emails, dynamic websites, portals, information management systems and shared databases, electronic white boards, and communication networks are required to enable information sharing in government departments
Identify information sharing influential factors in government departments.	How is information shared between persons and departments in governments?	Integrated ICT infrastructures, top management support, budget allocation to ICT innovations, skills development and training are required organizational characteristics to implement ICT which enables information sharing.
Establish why information is shared. Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government.	What are the purposes of sharing information within departments?	Information sharing purposes serve different purposes in different departments. Information sharing enables achievement of improved policy coordination between governmental agencies on a more timely and effective manner (UN, 2008), revitalize government processes, and also timely and efficient service delivery to citizens and businesses.
Identify and Recommend dimensions for information sharing effectiveness.	What leads to effectiveness of information sharing in government departments?	A good understanding of information flows in terms of Technology applicable, Organisation, Environment and People dimensions involved will enable or allow e-government initiative leaders, software developers and donors to identify information sharing needs for improvement and develop a software application that leads to of information sharing.
Identify strength and weaknesses of current information sharing policy, process and practices to support information sharing in the government department.	What are the information needs of service provision by the CA department?	From the case study, the following needs for improvement of service provision by the CA departments were identified: • Registration process is currently completed manually. Documents are shared between different levels in a paper file. Resultantly, information can get lost in the exchange process. • The OVC registration systems is cumbersome, currently it takes about four months for benefits to be paid out to beneficiaries (see figure 6.1). • Searching for clients' files in pigeonholes is time consuming and an ineffective

		way of data storage. • Although the department has a database in place, it is not shared by all actors (see figure 6.1 above) at all levels. An information system accessible to actors at different locations is required. • There are no information sharing guidelines in the department of CA. • The ways of sharing information between the three levels are mobile phones and telephones; which leaves no record and the monthly pay-out data on a CD, which takes some time to get to the intended recipients. In addition to the earlier stated are internal memos and departmental meetings. • The enquiries services are time consuming, and clients have to revisit CA offices in order to find out the status of their applications. • There is a need for a computer information system to manage OVC registration data and share this information among all offices. • Constituency officers lack the ICT they need. • Participants at regional and head office administrative levels indicated a need to have access to the Internet and emails. This requires fully implemented and maintained ICT infrastructures. • Although computers are available to some officers at regional level, only a few are functioning properly, while those at constituency level are underutilized due to a lack of skills among employees and lack of electricity.

6.4 Recommendations to the CA department

In order for the CA department to offer timely services to citizens and share information efficiently, the department should implement ICT to streamline information sharing processes to achieve primary purposes of the department. The implementation of ICT via the e-government initiatives will provide solutions to pertinent issues such as delays of information, lengthy registration process and others which are experienced between departmental offices. The CA department should embark on streamlining the information sharing processes, taking into consideration the four contexts of the information sharing model discussed in this study. The following should be considered to overcome factors impeding information sharing presently between the investigated administrative levels.

- Consider electronic information sharing. This can be achieved by implementing inter-organisational systems between the department and external stakeholders in the OVC related activities, e.g. a shared database.
- Draft a departmental electronic information sharing guideline.
- Implement Information Systems to mediate and store information between administrative levels.
- Concentrate on a central storage of information that available to all stakeholders via the web.
- Looking at the penetration of mobile technologies, consider a software application that supports mobile technology to deliver grant claims status notifications and enquiries.
- Train staff members on available tools for effective information sharing purposes.

6.5 Research significance

This study adds to the body of knowledge on how information sharing takes place in the Namibian government departments, focusing on identifying information sharing needs. Factors bearing on information sharing in developing countries are alluded in this study. The derived conceptual model for information sharing effectiveness is applicable to information sharing within the departments studied. This model can be used in similar studies in other developing countries. Furthermore, scholars and researchers can study and develop or broaden the conceptual model based on the analysis of information sharing impediments and benefits. The study provides insight on information sharing in government departments identifies bottlenecks likely to be encountered during information sharing processes in departments and recommend possible needs for improvement.

6.3 Limitations and suggestions for further research

Due to time constrains, this study was limited to explore information sharing in the CA department, OVC registration activity, focusing on internal stakeholders at national, regional and constituency levels only. Although the CA department has regional offices in all thirteen (13) regions, only employees (actors) from two (2) regional and ten (10) constituency offices were interviewed. The needs for improvements are established from the interviews. Factors influencing internal information sharing in government department have been eluded in this study, to offer an understanding of information sharing effectiveness and efficiency within departments.

The study excludes external stakeholders of the CA department in OVC registration process such us PACT, USAID, Ministry of Health, citizens/community and others, resulting in not establishing needs of service provision to external stakeholders, this calls for further investigations. Further studies could specifically focus on the type of technologies such as mobile technology and information portals in facilitating information sharing.

6.5 Conclusion

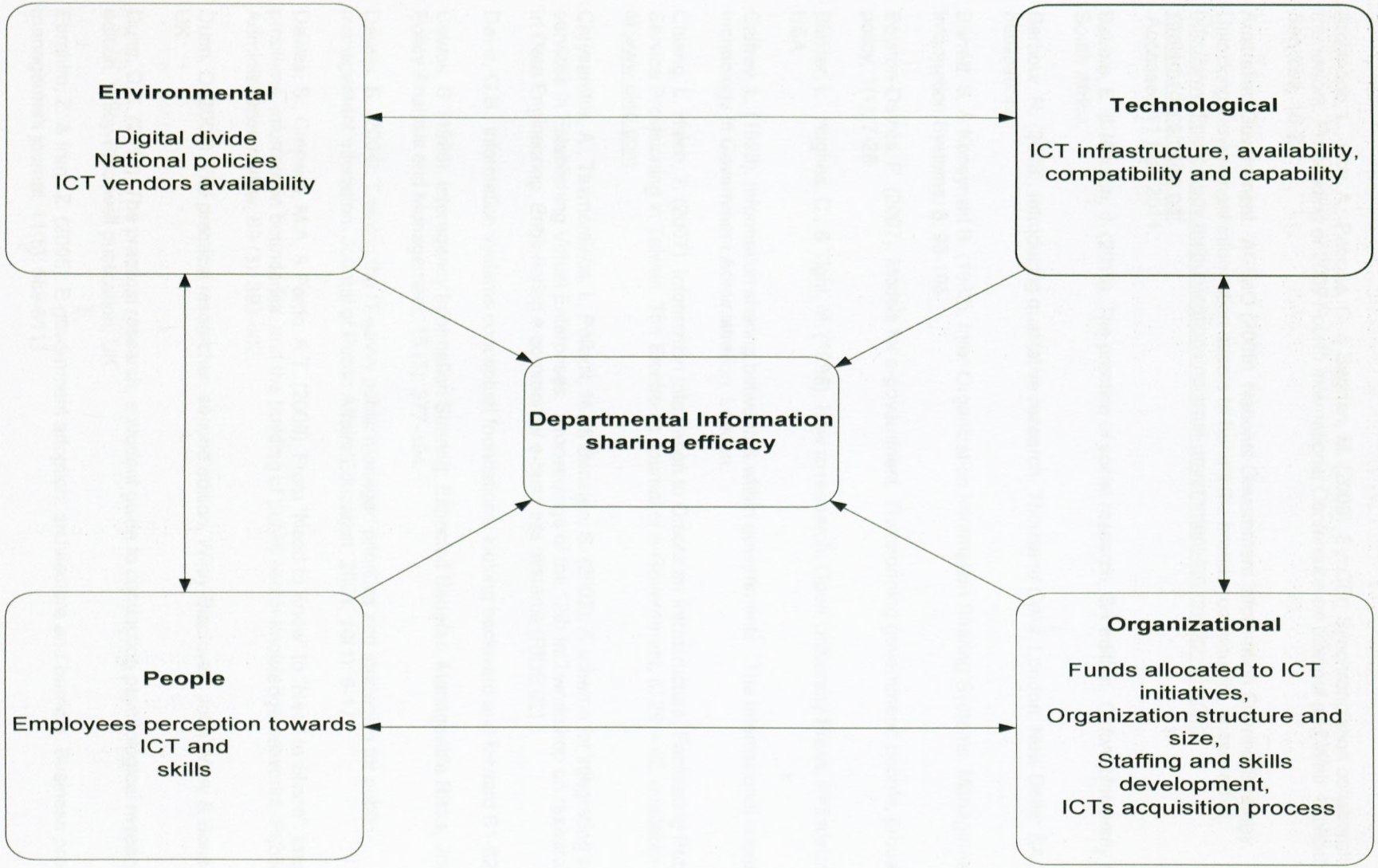
The purpose of information sharing through e- government initiatives implementation is to revitalize government processes and to achieve information sharing benefits. Intra information sharing leads to effective and timely service delivery and eliminates duplication of data while realizing ICT value. Factors under the technological, organizational, environmental and people contexts contribute positively and negatively to information sharing processes. These factors positively impact information sharing if well thought-out and tackled by governments. Failure to consider such factors or partial consideration of the four related factors leads to duplication of efforts, and inflexibility of data management and information sharing within and between departments. This study suggests that the influential contexts are inter linked and should be used as suggested. In this study, policy factors are closely allied to the organizational context. The derived electronic information sharing conceptual model (TEOP) in this study is applicable to explore information sharing effectiveness in government departments by identifying benefits and barriers associated with each context. The model entails four inter-linked contexts with pertinent elements.

The technological context focuses on factors that influence information-sharing in government organizations such as ICT infrastructures, capability, availability and compatibility of ICTs. The organizational context refers to characteristics of the agency influencing information sharing processes within the organization such as organization size, funds allocated to ICT initiatives, information sharing practices and skills in the organization.

The environmental context describes the organizational surroundings and internal and external factors influencing electronic information sharing such as availability of required infrastructures to enable ICT use. Environmental factors include, and are not limited to, location of the organization, the digital divide, and distribution of electricity and availability of ICT vendors. The people context describes the society / citizens and employees involved in the information sharing system. Significant factors influencing the people context are perceptions, skills and attitudes towards ICTs and information sharing concepts. The combination and acknowledgement of all contexts in ICTs implementation processes for information sharing purposes in an organization will leads to accomplishing electronic information sharing effectiveness and efficiency. Lines between the square contexts indicate a connection and need to consider all contexts in order to attain information sharing successes.

In this study the researcher was able to explore and establish information sharing needs of the CA department using the TOEP model (figure 6.1). Based on the findings, the department discussed needs technological infrastructures and equipment's such as computers to share information. The study indicates that documents that are supposed to guide information process in the organizational are not in place. Employees also lack skills to use ICTs. Absence of electricity at rural areas is the main reason as to why the department cannot have all necessary tools in order.

Figure 6.1TOEP information sharing effectiveness model



REFERENCES

Akbulut, A.Y. (2003). Investigation of the Factors that influences electronic information sharing between state and local agencies. *Doctoral thesis,* Louisiana State University.

Ardissono, L., Goy, A., Petrone, G. & Segnan, M. (2009). SynCFr: Synchronization collaboration framework. *Proceeding of 2009 Fourth International Conference on Internet and Web Applications and Services,* 18-23.

Australian Government. AGIMO (2009). National Government Information Sharing Strategy, Unlocking Government information assets to benefit the broader community, accessed at; http://www.finance.gov.au/publications/national-government-information-sharing-strategy/docs/ngiss.pdf.
Accessed 11 May 2011.

Babbie, E. & Mouton, J. (2010). The practice of social research, SA edition, *Oxford University Press*, South Africa.

Barbour, R. (2008). Introducing qualitative research. *Thousand Oaks*, London, New Delhi: SAGE publications.

Barrett, S. & Konsynski B. (1982). Inter-Organization Information Sharing Systems. Management Information Systems, 6: 93-105.

Beynon-Davies, P. (2007). Models for e-government. Transforming government: people, process and policy, 1(1): 7-28.

Blaxter, L., Hughes, C., & Tight, M. (1998). How to research. Open University Press, Philadelphia. USA

Caffrey, L. (1998). Information sharing between & within governments. The international council for technology in Government Administration, London.

Chiang, L. Hsieh, T. (2007). Information Integration to Create an Infrastructure: Facilitating Public Service Provisioning in Taiwan. The Electronic Journal of e-Government, 5: 29 – 42, available online at www.ejeg.com.

Chrysanthis, A., Tsamardinos, I., Pollack, M., & Banejee, S. (2002). A scheme for integrating e-services in Establishing Virtual Enterprises. Proceedings of the 12th Int'l workshop on research issues in Data Engineering: Engineering e-commerce/ e-business systems (RIDE'02).

Davis, G.B., information systems conceptual foundations: looking backward and forward 61-82.

Dawes, S. (1996). Interagency Information Sharing: Expected Benefits, Manageable Risks, Journal of Policy Analysis and Management, 15 (3): 377-394.

Dawes, S. (2004). Training the IT-savvy public manager: priorities and strategies for public management education, Journal of Public Affairs Education, 2004, 10(1): 5-17.

Dawes, S., Creswell, M.A, & Pardo, A.T. (2009). From "Need to Know" to "Need to Share": tangled problems, information boundaries, and the building of public sector knowledge networks. Public Administration review, 69 (3): 392-402.

Dunn, D (2009). The practical researcher, second edition, Wiley-Blackwell. John Wiley & Sons L.t.d. UK.

Dunn, D.S. (2010). The practical research, a student guide to conducting psychological research. 2nd edition, Wiley-Blackwell publication, UK.

Ebrahim, Z. & Irani, Z. (2005). E-government adoption: architecture and barriers. Business processes management journal, 11(5): 589-611.

Elo, S. & Kyngas, H. (2007). The qualitative content analysis process. Journal of Advanced Nursing, 62(1), 107-115.

Estevez, E., Fillottrani, P. & Janowski, T. (n.d), Information sharing in government – conceptual for policy formulation.

Fan, J. & Zhang, P. (2007). What factors influence the information sharing across government agencies? Proceeding of the Service Systems and Service Management 2007 International conference. Chengdu, June 9 11: 1-4.

Fan, J. & Zhang, P. (2010). A conceptual model for G2G information sharing in e-government environment. The sixth Wuhan International Conference on e-business, Wuhan (CN), 199-204.

Gichoya, D. (2005). Factors affecting the successful implementation of ICT projects in government. The Electronic Journal of e-Government, 3(4): 175-184, available online at www.ejeg.com.

Gil-Garc´ıa, J.R. & Pardo, T.A. (2005). E-government success factors: Mapping practical tools to theoretical foundations, Government Information Quarterly, 22: 187–216.

Gil-Gracia, J.R. & Helbig, N. (2007b). Exploring e-government benefits and success factors. Available at: www.irma-international.org/chapter/exploring-government-benefits-success-factors/11596/. (Accessed June, 01, 2011).

Gil-Gracia, J.R., Chengalur-Smith, I. & Duchessi, P. (2007a). Collaborative e-government: impediments and benefits of information-sharing projects in the public sector. European Journal of Information Systems, 16: 121-133.

Graneheim, U.H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. Nurse education today, 24, 105-112

Grarcia-Molina H. and Ullman, J. et al. (2002). Database systems: the complete book, Prentice-hall, Englewood cliffs, New York.

Hans, J.S (2003). E-government: a special case of ICT enabled business process change. Proceedings of the 36th Hawaii international conference on system science.

Headayetullah, Md. & Pradhan, G.K (2009). A novel trust-based information sharing protocol for secure communication between government agencies. European Journal of Scientific research. 34 (3): 442-454.

Heeks, R. (2002). E-government in Africa: promise and practice. Paper no. 13. Available at: http://idpm.man.ac.uk/wp/igov/index.htm, (Accessed May 20, 2011).

Heeks, R. (2002). Information Systems and Developing Countries: Failure, Success, and Local Improvisation. The Information Society, 18: 101-112.

Heeks, R., (2006). Understanding and Measuring e-government: International Benchmarking Studies, UNDESA workshop, E-Participation and E-Government: Understanding the Present and Creating the Future, Budapest, Hungary, 27-28 July.

Henning, E., Van Rensburg, W. & Smit, B. (2004). Finding your way in Qualitative Research. Pretoria: Van Schaick.

History of e-government- ICT4D (2011) Available at: http://www.caricomict4d.org/index.php?option=com_content&task=view&id=71&Itemid=60, (Accessed 22, September 2011).

Hossan, C.G. Habib W. & I. Kushchu, (n.d). Success and Failure Factors for e-Government projects implementation in developing countries: A study on the perception of government officials of Bangladesh.

Hsieh, H.F. & Shannon, S.E. (2005). Three approaches o qualitative content analysis. Qualitative Health Research Journal, 15(9), 1277-1288.

ICT4D. (2011). http://www.caricomict4d.org/news-mainmenu-60/16-e-governance/71-history-of-e-government.html. (Accessed June 22, 2011)

InfoDev. (2002). The e-government handbook for developing countries, available at: www.cdt.org/egov/handbook.

Information exchange-wikipedia, the free encyclopedia. Available at: http://en.wikipedia.org/wiki/information_exchange. (Accessed 22 Septermber, 2011).

IS theory web - Technology Acceptance Model. Available at: http://www.istheory.yorku.ca/Technologyacceptancemodel.htm\. (Accessed 23 September 2011).

ITU - International Telecommunication Union. (2010). Information Society Statistical Profiles 2009, Africa, World Conference Development Information Society Statistical Profiles 2009.

Janssen, M. & Wagennar, R. (2004). An analysis of a shared services centre in E-government. Proceedings of the 37th Hawaii international Conference on System Sciences.

Julibert, S. (2008). Employee attitudes to information sharing: a case study at the European central bank. Record Management Journal, 18(3): 194-204.

Kakololo, R. (2007). Online dissemination of information to government employees in the public service of Namibia. Windhoek: University of Namibia.

Karokola, G. & Yngstrom, L. (2009). State of e-government development in the developing world: case of Tanzania – security vie. Proceedings of the 5th International conference on e-government. Boston, USA, 92-100.

Korpela, M., De la Harpe, R. & Luukonen, I. (2008). Depicting the landscape around information flows: methodological propositions. Proceedings of SIG GlobDev's First Annual Workshop. Paris, France.

Korpela, M., Mursu, A. & Soriyan, H.A. (2002). Information systems development as an activity, Computer Supported Cooperative Work 11: 111-128.

Landsbergen, D., & Wolken G. (2001). Government Information Systems and the Fourth Generation of Information Technology, Journal of Public Administration Review, 61(2): 206-220.

Lee, M.S. Tan, X. & Trimi, S. (2005). Current practices of leading e-government countries. Communication of the ACM, 48 (10) 99-104. Available at: http://acme.highpoint.edu/~msmith/France/Articles/EGovernment.pdf (Accessed 22, September 2011)

Lippert, S. & Govindarajulu, C. (2006). Technological, Organizaional, and Environmental antecedents to web services adoption. Communication of the IIMA, 6 (1): 146-158

Luukkonen, I., Korpela, M. & Mursu, A. (2010). Studying the Applicability of Methods - Activity Driven Needs Analysis Applied to Maternity Pathway in Pudong, Shanghai. In: Ubi-Health'10 - International Workshop on Ubiquitous Healthcare and Supporting Technologies, Shanghai.

Namibia. http://www.grnnet.gov.na/aboutnam.html (Accessed 13 September 2011).

Namibia. Information Communication Policy for the Republic of Namibian government (2004).

Namibia. MGECW. (2010). http://www.mgecw.gov.na/childwelfare/childallowance.html (Accessed March 08, 2011).

Namibia. MGECW. Capacity to manage alternative care assessment report: (2008)

Namibia. MoF (2011): http://www.mof.gov.na/ifms.htm (Accessed 04 September 2011).

Namibia. OPM. (2010). http://www.grnnet.gov.na/grnabout.html (Accessed November 13, 2010).

Namibia. OPM. (2005). The e-governance policy for the public service of Namibia. Available at: //www.grnnet.gov.na/grnnews/ ftp://209.88.21.60/pub/docs/E-Governance_Policy_Final.pdf (Accessed 12 September, 2010)

Nanping, Z. & Yuan, L. (2008). Study and application of the SOA based e-government system. Proceeding of the International conference on Information Management, Innovation Management and Industry Engineering. Taipei, 476-479.

Narayan, G. (2007). Addressing the digital divide: e-governance and m-governance in a hub and spoke model. The electronic journal of Information systems in Developing Countries, 31(1): 1-14. Available at: http://www.ejisde.org.

Ministry of ICT, (2011). www.mict.gov.na

O'brien, J. & Marakas, G. (2005). Management information systems, McGraw-Hill companies, New York.

Ochara-Muganda, N. & Van Belle, J. (2010). A proposed framework for e-government knowledge infrastructures for Africa's transition economies. Journal of e-government studies and best practices. 2010 (id 303226).

Oliveira, T. & Martins, M.F. (2011). Literature review of information technology adoption models at firm level. The electronic Journal Information Systems Evaluation, 14(1): 110-121.

Palvia, S. C. J., Sharma, S. (2007). E-Government and E-Governance: Definitions/Domain Framework and Status around the World. In Agarwal, Ramana, V. V. (eds.) Foundations of E-Government. ICEG 5th International Conference on E-Governance.

Rao, M., (n.d). Measuring the Success of Information Systems: Case Study of a University Student Services System, 408-418.

Rogers, E., M (2003). Diffusion of Innovations. New York, Simon and Schuster.

Ruhode, E. & Owei, V. (2010). Harnessing information and communication technologies for diffusing connected government applications in developing countries: Concept, Problems and Recommendations, International Journal of Technology Diffusion, 1(1): 1-17.

Sapsford, R., & Jupp, V. (1996). Data collection and analysis. SAGE publications Ltd. Thousand Oaks, California

Saunders, M., P. & Thornhill, A. (2003). Research Methods for Business Students. 3rd Edition. Essex: Pearson Education Limited.

Schwester, R. W. (2009). Examining the Barriers to e-Government Adoption. Electronic Journal of e-Government, 7(1): 113 - 122, available online at www.ejeg.com

Some Observations on Liberian's. Journal Telecommunication and ICT sector policies. Available at: http://www.theliberianjournal.com/index.php?st=news&sbst=details&rid=1218. (Accessed 22 September, 2011).

Stake, R. E. (1995). The art of case study research. Thousand Oaks, CA: Sage.

Stephanie, B. & Benn, K. (1982). Inter-organization information system. MIS Quarterly, 6, 93-105.

Street, T.C, & Goldsmith, D. (2004). Inter-organizational systems and embedded relationships: a resource dependency perspective of inter-organizational systems management. Journal of Information Science and Technology. 1 (2): 8-56.

Struwig, F.W. & Stead, G.B. (2001). Planning, designing and reporting research. Cape Town: Pearson education.

Smith, T. (2009). The social media revolution. *Journal of marketing research*, 51(4): 559-561.

Tan, T. (2010). A perception-based model for Technological innovation in small and medium enterprises. 18th European conference on information systems, research in progress, South Africa, Available at: web.up.ac.za/ecis/ECI2010PR/ECIS2010/Content/Papers/0232.R1.pdf Accessed 10 Feb 2011).

Taylor-Powell, E. & Steele, S. (n.d). Collect evaluation data: direct observation, program development and evaluation. University of Wisconsin-extension.

Telefonica S.A. Corporate responsibility annual report (2002). Available at: http://www.telefonica.com/en/shareholders_investors/pdf/AnnualReport_Telefonica_03_eng.pdf (Accessed 17 June 2011).

Tempo, R. (2008). Information and communication technology usage trends and factors in commercial agriculture in the wine industry. Master's thesis, CPUT, Cape Town, South Africa

Themistocleous, M. & Sarikas, O. (2005). Thoughts on e-government. The journal of Enterprise Information Management, 18(5): 508-510.

Tornatzky, L. G. & Fleischer, M. (1990). The Processes of Technological Innovation. Lexington, Massachusetts, Lexington Books.

US gov, (2013). How to.gov, available at: http://www.howto.gov/social-media/microblogging/twitter-town-hall-best-practices, accessed: 01 June, 2013

UN (2008). E-government survey Report. unpan1.un.org/intradoc/groups/public/documents/un/unpan028607.pdf (Accessed October 04, 2010).

UNDP (2007). E-government interoperability guide. Available at: http://www.ibm.com/ibm/governmentalprograms/undp-gif-guide.pdf (Accessed June 05,2011)

UNDP. Standard forum (2009). Country brief, Namibia, available at: http://www.estandardsforum.org/system/briefs/288/original/brief-Namibia.pdf?1254987855 (Accessed 05 May 2011).

Watson, R.W. (2000). An enterprise information architecture: a case study for decentralized organizations. Proceedings of the 33rd Hawaii International Conference on System Sciences. Maui, HI, Los Alamitos, CA: IEEE Computing Society Press.

Weerakkody, V., El-Haddadeh, R. & Al-Shafi, S. (2011). Exploring the complexities of e-government implementation and diffusion in a developing country: the lesson from the state of Qatar. Journal of Enterprise Information Management, 24 (2): 172-196.

William H. Delone & Ephraim R. Mclean, (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. Journal of Management Information Systems / Spring, 19(4): 9–30.

World Bank. (2008). Namibia data profile. http://devdata.worldbank.org (Accessed 25 June, 2011)

Yan, Z., Sun, B., & Wang, T. (2009). A study on information sharing of e-government. Proceeding of 2009 IEEE International Conference on grey system and intelligent services held in Nanjing, China, 1331-1335.

Yin, R. K. (2004). Case Study Research: Design and Methods, Fourth Edition (Fourth Edi.). Thousand Oaks, London, New Delhi: SAGE Publications.

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. In B. Wildemuth (Ed.), Applications of Social Research Methods to Questions in Information and Library Science (pp.308-319). Available at: http://www.ischool.utexas.edu/~yanz/publication.html, (Accessed November, 15, 2011)

Zhu, Y., Li, Y., Wang, W., Chen, J. (2010). What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry, International Journal of Information Management, 30, 265–276.

APPENDICES

APPENDIX A: AUTHORISATION TO CONDUCT INTERVIEWS

REPUBLIC OF NAMIBIA

MINISTRY OF GENDER EQUALITY AND CHILD WELFARE

Tel: + 264 61 283 3111
Fax: + 264 61 238 941/240 898
E-mail: genderequality@mgecw.gov.na

Private Bag 13359
Windhoek
Namibia

Our Ref.: **7/2/10**
Your Ref.:
Inquiries: **Ms. H. Andjamba**

19 July 2011

Ms. Suama L. N. Hamunyela
M-Tech Research Student
Cape Penninsula University of Technology
Cape Town

Dear Ms. Hamunyela

RE: PERMISSION TO CONDUCT A STUDY ON INFORMATION SHARING IN GOVERNMENT DEPARTMENTS

Your letter dated 20 June 2011 on the above-mentioned hereby refers.

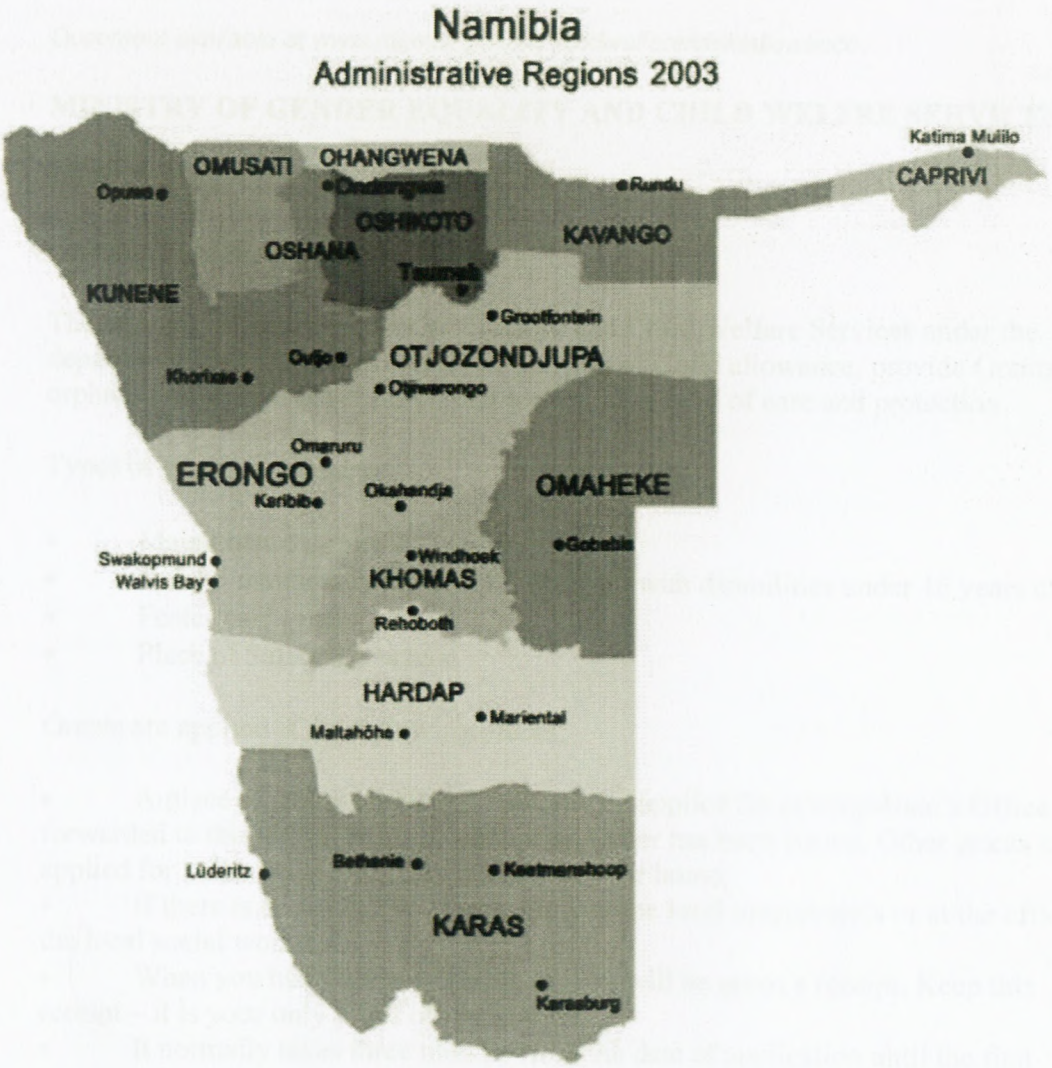
The Ministry of Gender Equality and Child Welfare is hereby granting permission to undertake the research on the above-mentioned subject as your findings will be beneficial to the Ministry. You will be working closely with staff from the Head Office and Oshana regional Office and the staff members will be informed accordingly.

Yours sincerely

Sirkka Ausiku (Ms)
PERMANENT SECRETARY

All official correspondence must be addressed to the Permanent Secretary

APPENDIX B: NAMIBIA ADMINISTRATIVE REGIONS



APPENDIX C: MINISTRY OF GENDER EQUALITY AND CHILD WELFRE SERVICES DEPARTMENT: CHILD WELFARE

Document available at www.mgecw.gov.na/childwelfare/childallowance

MINISTRY OF GENDER EQUALITY AND CHILD WELFRE SERVICES

DEPARTMENT: CHILD WELFARE

Division: Child Allowances

The ministry Ministry of Gender Equality and Child Welfare Services under the department of child welfare services, division of Child allowance, provide Grants to orphans and vulnerable children that are found in need of care and protection.

Types of grants for children

- Maintenance grants
- Special maintenance grants for children with disabilities under 16 years of age
- Foster care grants
- Place of Safety allowance

Grants are applied at the following places;

- A place of safety allowance can only be applied for at magistrate's Office and forwarded to the MGECW after a detention Order has been issued. Other grants can be applied for at the MGECW office closest to your home.
- If there is no MGECW office, apply at the local magistrate's or at the office of the local social worker.
- When you had your application in, you will be given a receipt. Keep this receipt – it is your only proof of application.
- It normally takes three months from the date of application until the first payment is made.
- You do not have to pay any money to apply.
- If your application is not approved you will be informed in writing why your application was unsuccessful.
- All copies of documents should be certified. Documents can be certified at the local Police Station.
- Application must submit the school progress report of the relevant child(ren) every term for payment to continue.

If the application is approved, you will be paid from the day of approval. You can choose how you want it to be paid:

- Cash payment
- Bank account
- Post office

If you can't collect your grant yourself, or the concerned children do not live with you, you may appoint a person you trust to collect your grant regularly for you or for the concerned children's caretaker. This person is called a procurator.

1. Maintenance grants

Who qualified for maintenance grant?

A biological parent with children under 18 years of age, and:

- Whose spouse, the breadwinner, receives an old age pension or disability grant.
- Whose spouse, the breadwinner, has died.
- Whose spouse, the breadwinner, is in prison for six months or longer.

The following documents are needed to apply:

- Certified copies of applicant's birth certificate and ID.
- Certified copies of children's full birth certificates, confirmation of birth or baptism card.
- Certified copy of applicant's marriage certificate (if applicable).
- School report of child(ren), if attending school.
- Certified copy of breadwinner's death certificate.
- Letter from prison if breadwinner is in prison, and declaration form breadwinner in prison.
- Proof of breadwinner receiving disability or old age grant.
- If employed, a pay slip with the name, telephone number and address of the employer, stating the amount of money the applicant ears.

2. **Special maintenance grants**

Who qualifies?

A disabled child who is under 16 years of age.

The following documents are needed to apply:

- Certified copy of the child's full birth certified.
- Certified copy of parent(s) ID and birth certificate.
- Medical certificate form State medical officer or doctor confirming disability
- A social background report from the social worker

3. **Foster care grants**

Who qualifies?

A foster parent is any person who undertakes the temporary care of any child found to be in need of care and who has been placed in his/her custody in terms of Section 31(I)(b) or Section 50(I) of the Children's Act, (Act, No. 33 of 1960).

What do you require when applying?

The applicant (the foster parent) must submit the following documents:

- Children's Court Order, or, if the child was transferred, the Section 50 (I) Transfer Order.
- Certified copy of the concerned child's birth certificate.
- School report of school-going children.
- ID and birth certificate of foster parent (marriage certificates as well, if applicable).

4. **Place of Safety allowance**

Who qualifies?

Any person in whose care, or place at which, a child under the age of 18 is placed by a Commissioner of Child Welfare in terms of Section 33 of the Children's Act of 1960. It also describes a Place of Safety as any place established under Section 38 of the Act and includes any place suitable for the reception of a child, into which the occupier thereof is willing to receive the child.

What do you need to apply?

The place of Safety Claim Form must be completed and signed by the Magistrate's Office and the claimant. The following documents will be needed:

- Place of Safety Claim Form, Completed in full.
- Order(s) of detention.

Other government ministries that may be of assistance

Ministry of Education

- Exemption of school fees for OVC
- School counseling
- School reports

Ministry of Health and Social Services

- Health records
- Nutritional information and support
- Medical report for disability grant

Ministry of Justice

Court orders for foster care placements and Places of Safety Placements

Ministry of Home Affairs & Immigration

- Birth certificates (full and abridged)
- Death certificates
- Marriage certificates
- Application for Identity documents

Only Namibian citizens and permanent residents may apply for the grants.

APPENDIX D: INTERVIEWS GUIDE

INTERVIEWS TO EXPLORE INFORMATION SHARING NEEDS AND FLOWS IN/BETWEEN GOVERNMENT DEPARTMENTS: OVC GRANT REGISTRATION ACTIVITY

MGECW, Child Allowance divisions (Khomas - head Office, Oshana CA regional and constituency offices

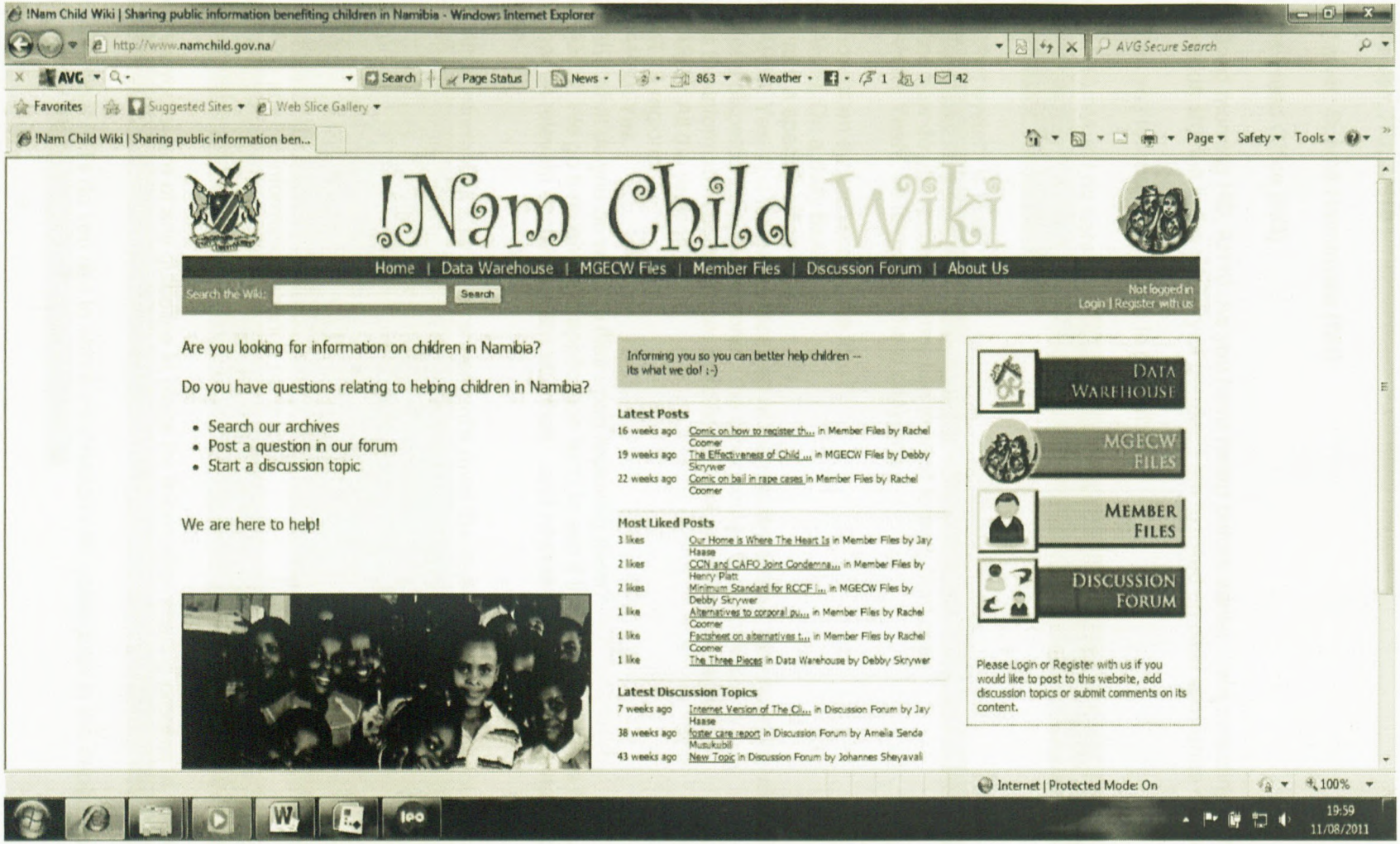
The questions aim to guide interviews to gather relevant and sufficient information about the information sharing and flows within targeted government department and investigate how ICTs and other factors are contributing to the efficacy of information sharing. To achieve the objective of the study, for extensive exploration and for better recommendations, the use of ICTs in information sharing process to accomplish departmental activities is incorporated in this questionnaire. Information obtained will be used to:

- Describe how information is shared within and between government departments including the technologies currently used.
- Identify technological requirements to support information sharing in the government.
- Identify the organizational needs to share information using ICTs.
- Validate and recommend identified influential factors for information sharing efficacy
- Recommend a viable conceptual framework to facilitate information sharing.

Anticipated outcome of the questionnaires are intended to benefit different Namibian government departments and assist in compiling a submission for a Masters in information technology theses. In all cases the identity of the participants will be protected and not revealed. This interview does not deal with sensitive or private information and the sharing aspect investigated will be for information and its flows in general.

Theme A: Organization and information sharing needs
What information sharing arrangements do the ministry/departments currently have in place? Please provide a description of current information sharing activities
Who are the main information sharing partners?
Are you aware of information sharing guideline document?
How do guardians/applicants get to know the application status?
Theme B: ICTs – storing and mediation technologies
Which ICTs do you use to share information with colleagues in the department?
Where and how is information received from constituencies/regions stored?
How is information communicated from your desk to the next person inline?
What mediation technologies are used to share information within the department or with stakeholders? Please mention the technology tools if any.
Which ICTs are you familiar with and able to use?
Theme C: Geographical environment
How do you classify your office location?
Theme D: People
Which ICTs do you know and able to use?
What do you think about sharing work related information with colleagues?
What are your views on the use of ICTs to share information?
What would you like to see changing regarding information sharing

APPENDIX E: NAM CHILD WIKI (available at: www.namchild.gov.na)



APPENDIX F: EXAMPLE OF HEAD OFFICE EMPLOYEE TRANSCRIPT

Interview transcript **10**

Date: 19.07.2011

Interviewee: **HO, AH10**

Interviewer: Suama Hamunyela **(SH)**

Venue: Head Office **(HO)**

SH: Good morning HO, AH10. As you have heard before earlier, I am collecting data about information sharing in the ministry of gender. I am focused on child allowance division

Q1. Can you tell me what you do in this office?

HO, AH10: What I do here is...I receive application forms for grants, all type of grants we offer. I receive information form the regional officers, I read through, I approve and form here it goes to or system data office.

FQ: What system is that?
HO, AH10: We refer to it a social welfare systems, that is now **8
FQ: And how do you receive information in what format, hard copy
HO, AH10: Yeah!, its forms...so hard copy only

FQ: How often do you receive the files?
HO, AH10: On a daily basis
FQ: From a specific office or..?
HO, AH10: Yes, first forms are received at the registry office...they open the mail and make copy of a dispatch list and keep one...the other comes to my office.
FQ: Is the information coming from specific regions or only some regions?
HO, AH10: All the regions
SH: all 13 regions
HO, AH10: Yes
FQ: And what do you do with the files upon receiving them?
HO, AH10: We go through each application form to see if the person qualifies for the grant, whether all relevant documents are attached...and whether the copies are clear and all those things

Q2. What information sharing arrangement's does the department has in place currently?
HO, AH10: Ok, when we process the information...when we enter the information in the system, we use computers. First we ...this hard copy, we enter in the system and distribute the CD s to the regional officers and constituency officers and also our directors and deputy directors. That is now the information on...yeah statics and ....all the information we have in the system every month.

Q3. Who are the information sharing partners?
HO, AH10: I would say...from me it's between constituency office, regional, national level and database office.

Q4. Are you aware of any guideline in place for information sharing process in the ministry?
HO, AH10: No, I am not aware of any guidelines.

Q5. Ok, what ICTs do you use to share information with colleagues in the department?
HO, AH10: We use CDs and USBs and emails

Q6: How is information communicated from your desk to the next person in line?

HO, AH10: Usually hard copy, CD, USB...not much....internet, email, telephone...yeah,

Q7: Which other ICTs are you familiar with?
HO, AH10: Basically the computer and fax also

Q8: What do you think about the information sharing process currently?
HO, AH10: Currently, yeah! I think of...it's not always that we have meetings to update each other if there are changes in procedures or information that we need to know. So, it's like one on one instruction

FQ: What would you like see changing?
HO, AH10: To improve?
SH: Yes
HO, AH10: We also have workshops time to time, but I think it should be more often for newly appointed staff members and who are at the ground level...especially in the first year there should be more workshops and training...And otherwise...if there is workshops and staff meetings.

Ok, thank you for taking part in these interviews.

APPENDIX G: EXAMPLE OF CONSTITUENCY EMPLOYEE TRANSCRIPT

Interview transcript **5**

Date: **19.07.2011**

Interviewee: **CO, AH5**

Interviewer: Suama Hamunyela **(SH)**

Venue: Ongwediva regional office **(ORO)**

Hallo CO, AH5 how are you. Please feel free a....we have talked about the cover page already and discussed questions guiding the interview. I might ask you questions which are not in the interviews guide. I mentioned that I will not ask you question one, so we are moving on to question two.

Q2. Who are your information sharing partners? Whom do you share information with?
CO, AH5: I share with our clients, colleagues and...[silence]
FQ: Before we get to the end of that question, tell me what you do at the ministry of gender?
CO, AH5: we compile application for grant
FQ: After compiling the application, do you share it with someone or you don't share with anyone.
CO, AH5: No, we don't
FQ: Not even with colleagues
CO, AH5: Sometime we do share...normally it's just me and my supervisor. But for her is just to sign it and send.

Q2. Are you aware of a document guiding you how you should share information with your colleagues?
CO, AH5: ...I'm not...
FQ: Only through meetings?
CO, AH5: Mhhh

Q3: Which ICTs do you use to share information with colleagues in the department?
CO, AH5: ...we have a telephone line, cell phone and ...
You visit her office?
CO, AH5: Yes

Q4: How is information communicated form your desk to her/him? Do you call?
CO, AH5: By telephone
FQ: Where is your supervisor based?
CO, AH5: Here at regional office
FQ: And your office?
CO, AH5: Omundja, 30km from oshakati
SH: Ough yaa! You are from a constituency right?
CO, AH5: Yes,
FQ: Do you have electricity there?
CO, AH5: Yes we do

Q5: What mediation technologies are used to share information apart from the telephone line, are there other mediation technologies, do you have a PC
CO, AH5: We do have it but we don't use it
FQ: You don't have a USB either?
CO, AH5: No,
FQ: Have you ever received computer training?
CO, AH5: ja, I know
FQ: You know how to use the computer?
CO, AH5: Yes

Q6: What other technologies are you familiar with, either you have them at your office or you don't have but you are able to use it?
CO, AH5: I use cell phones

Q7: What do you think about information sharing process?
CO, AH5: ....we use cell phone or visit physically...
FQ: Ja, but what do you think about the whole process currently is it...
CO, AH5: Maybe-- we need to be—we need our computer to be connected to the internet. Maybe it easy our work.

Q8:Anything else you would like to add to that, apart from internet?
CO, AH5: ....i cannot...
FQYou cannot think of anything at the moment?
CO, AH5: No

Ok, thank you for taking part in this interview

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