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A framework for the implementation of e-government as a service delivery mechanism in South Africa: The case of the Eastern Cape Thusong Service Centres

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ABSTRACT

E-government has emerged as an effective means of delivering much-needed online services to the citizens, businesses and other government institutions. This emanates from the advancement of Information and Communication Technology (ICT), the internet and the emerging technologies associated with the Fourth Industrial Revolution (4IR). E-government has essentially transformed the culture, structure and the way of doing business by public institutions in providing government services. In the past, e-government has been popular in developed countries but recently many developing countries are starting to appreciate the need to implement the initiative. However, the implementation of e-government has various challenges that have been identified through research and include technological, organisational and environmental aspects. Therefore, the researcher was motivated to study e-government to improve the delivery of services to citizens in South Africa.

The objective of the research was to develop a framework for the implementation of e-government as a service delivery mechanism in South Africa. The research process led to the identification of challenges that impact the implementation of e-government by applying an underlying Information Systems (IS) theoretical model, namely the Technology-Organisation-Environment (TOE) framework. The review of literature allowed the researcher to construct a conceptual theoretical framework which was then applied to the case study in order to understand the factors affecting the implementation of e-government in South Africa.

Qualitative research data was collected using Thusong Service Centres in the Eastern Cape as a case study. Thusong Service Centres are government service centres based in rural communities which are used for the provision of online government services to these communities. The empirical data was collected using 22 respondents from five organisational and user perspectives: (1) State Information Technology Agency (SITA) as an agency of government responsible for ICT in South Africa, (2) the Senior ICT Managers from various National, Provincial and Local government entities, (3) Thusong Service Centre Managers, (4) Thusong Service Centre End-Users and (5) Expert Reviews. Documents that included the National e-Government Strategy, e-Government Policy, National Broadband Policy, ICT Policy White Paper were also consulted as secondary data.

The conceptual theoretical framework was then revised based on the empirical evidence using the interpretive exploratory approach and triangulated data. The consolidated data from both the literature review and empirical evidence assisted in closing the gap between e-government implementation theory and practice. A detailed e-government implementation framework was then developed with the critical factors that impact the successful implementation of e-

government. E-government subject experts were also given the mandate to review the interview questions and the framework. The use of this framework was then explained in terms of how it can assist government decision-makers in South Africa for the effective and efficient delivery of services to the citizens. The research study has contributed to the e-government body of knowledge through the identified factors utilising the TOE framework at an organisational level for developing countries like South Africa.

Keywords: Technology-Organisation-Environment (TOE) framework, Fourth Industrial Revolution, e-government, Thusong Service Centres.

DECLARATION

I, Ayanda Madyibi, hereby declare that *"A framework for the implementation of e-government as a Service Delivery mechanism in South Africa: The Case of the Eastern Cape Thusong Service Centres"* research study is my work, and all sources used have been included as part of the references. The dissertation has not been previously submitted at any recognised educational institution.

Signature: 

Date: __1 February 2020_____

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DEDICATION

This PhD study is dedicated to my parents Mr Siza Madyibi and Mrs Nomgqibelo Madyibi for their moral support and inspiration. Also, to my wife Patiswa, our two children, Loyiso and Lonwabo, and my brother Masixole for their never-ending support and encouragement, you will always be my heroes. Not forgetting my late brother Xolani (“Xhobos”) who always emphasized the importance of education in the post-apartheid era.

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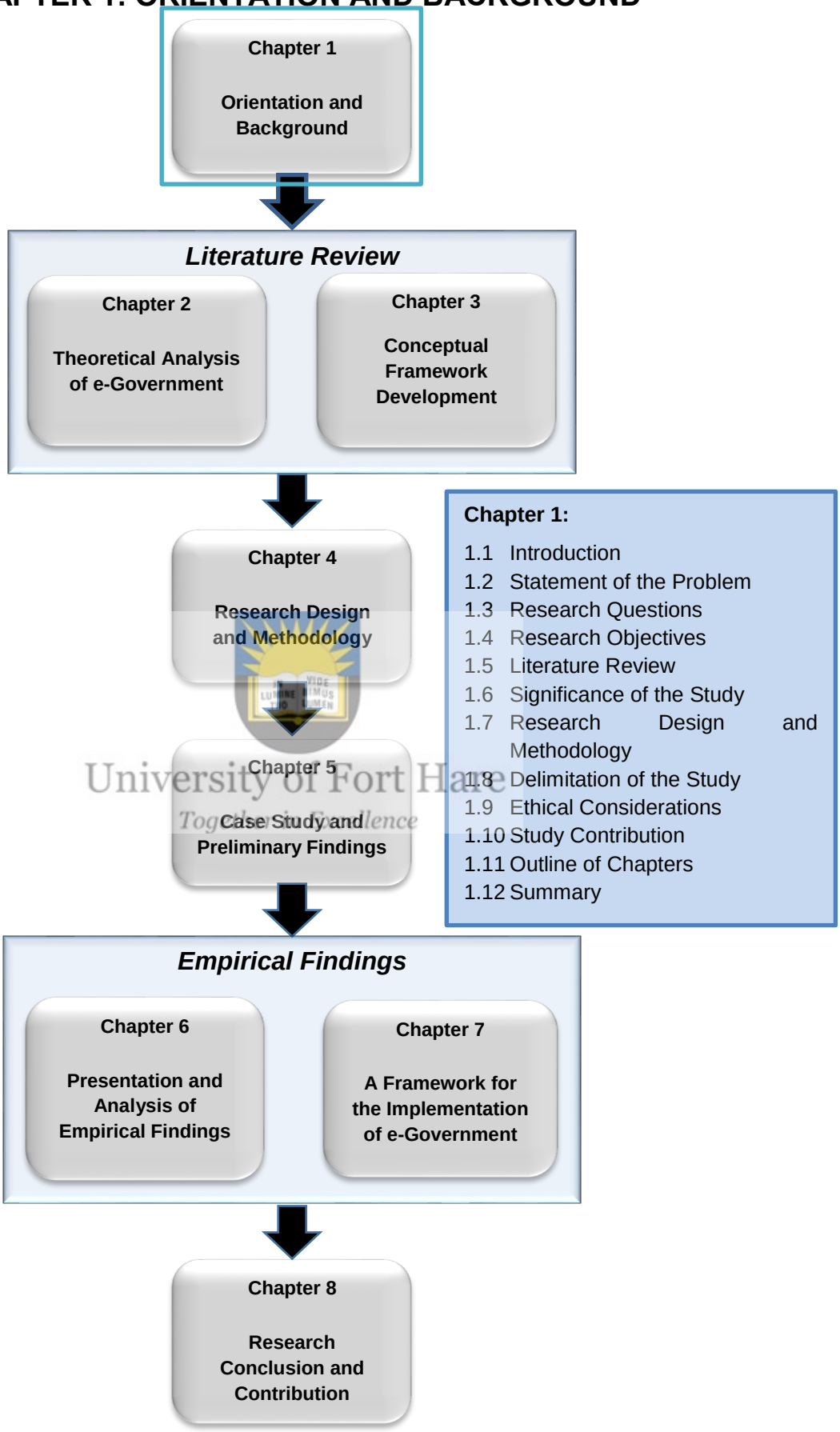
LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
ANC	African National Congress
ASGISA	Accelerated and Shared Growth Initiative of South Africa
BCM	Buffalo City Metropolitan
BPR	Business Process reengineering
CIO	Chief Information Officer
CMC	Centre Management Committee
CSF	Critical Success Factors
DCDT	Department of Communications and Digital Technologies
DEDEAT	Department of Economic Development and Environmental Affairs and Tourism
DHA	Department of Home Affairs
DHS	Department of Human Settlements
DoH	Department of Health
DOI	Diffusion of Innovation
DOT	Department of Transport
DPSA	Department of Public Service and Administration
DTPS	Department of Telecommunications and Postal Services
ECDPW	Eastern Cape Department of Public Works
ECPC	Eastern Cape Planning Commission
ECSECC	Eastern Cape Socio-Economic Consultative Council
EGDI	E-Government Readiness Index
EP	Expert Panel
EU	European Union
G2B	Government-to-Business
G2C	Government-to-Citizen
G2G	Government-to-Government
GCIS	Department of Government Communication and Information Systems
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
ICT	Information Communication Technology
IDP	Integrated Development Plan
IEC	Independent Electoral Commission

IFMS	Integrated Financial Management Systems
IoT	Internet of Things
IS	Information Systems
ITU	International Telecommunications Union
LGITC	Local Government Information Technology Council
MAN	Metropolitan Area Network
MPCC	Multi-Purpose Community Centres
MPSA	Minister of Public Service Administration
NDP	National Development Plan
NGO	Non-Government Organisations
NGP	New Growth Path
NPC	National Planning Commission
NPO	Non-Profit-making Organisations
OECD	Organisation of Economic Co-operation and Development
OTP	Office of the Premier
PDP	Provincial Development Plan
PGITOC	Provincial Government Information Technology Officers Council
PSA	Public Service Act
RDP	Reconstruction and Development Programme
SAPS	South African Police Services
SARS	South African Revenue Services
SA-SAMS	South African School Administration and Management Systems
SASSA	South Africa Security Agency
SITA	State Information Technology Agency
TAM	Technology Acceptance Model
TOE	Technology Organisation Environment Framework
TSC	Thusong Service Centres
TTF	Task Technology Fit
UAUT	Unified Theory of Acceptance and Use of Technology
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UREC	University Research Ethics Committee
WAN	Wide Area Network
WEF	World Economic Forum

CHAPTER 1: ORIENTATION AND BACKGROUND



1.1. INTRODUCTION

The South African Constitution requires the state to improve the value of life for all citizens through the use of modern electronic devices and technology, thereby enabling the rights of every citizen (Constitution of South Africa, 1996). This constituted democratic dispensation inspires various public-sector transformation processes and forces the government to prioritize key service delivery initiatives for disciplined and well-organized delivery of these amenities to the citizens. Key to transforming government processes involves the enterprise application of technology and data through Information and Communication Technologies (ICTs). This approach reflects a democratic roadmap to the information needs of citizens in the communication process (Janowski, 2015).

The government is confronting the demand for changing the public sector by re-building their procedures and, in the long term, ICT assumes a role in the proposed arrangement. If appropriately utilised, ICT can enable citizens to conquer social matters around the development and reinforce autonomous establishments (Nkwe, 2012). According to the Department of Telecommunications and Postal Services (DTPS, 2017), electronic government (e-government) centres around changing government into being citizen-focused which requires active collaboration between government departments, citizens and the business sector. The United Nations characterized e-government as an administration that uses ICT to change a government's internal and external business relationship (UNDESA, 2016).

In this way, e-government aims to advance the collaboration amongst government, citizens and business for the delivery of services by using ICT (Gil-Garcia and Pardo, 2005). E-government goes beyond the straightforward exercise of putting information and services on the web. It is utilised as an influential instrument to change the structures, procedures and culture of government and make it increasingly effective, citizen-focused and straightforward (OECD, 2013). E-government aims to provide first-class services that are ready to create important and required open service qualities through appropriate Information Technology (IT) means (Ammar et. al., 2018). This is another change in perspective from the customary practice in government and has realised a change in the nature of services provided to the citizens (UNDP, 2015). For example, the South African Revenue Services (SARS) used to manually capture the process of tax returns but now they have introduced an e-filing system where a user can interact with the system electronically.

In South Africa, the government has prioritised other demanding needs, thus ICT development has received little attention due to financial constraints. This has been caused by the country's political past and the resultant social settings which emanated from this; thus, any e-

government activity needs to compete with various other underlying burdens. These include an abnormal state of imbalance in terms of socio-economic status, digital divide, infrastructure limitations and spatial development structure; an incapable infrastructure foundation (especially in disadvantaged communities); and an absence of government preparation for ICT (Trusler, 2003).

The move toward the use of e-government initiatives requires unlocking any challenges relating to policy, institutional arrangements and political buy-in from the three spheres of government, which are represented by local, provincial and national governments. This will also include active participation from the ICT industry through requisite skills, technology and related investments (DTPS, 2017). In 1999, the South African government embarked on utilising ICT to provide for citizen needs by creating integrated one-stop Multi-Purpose Community Centres (MPCC) or Thusong ("place to get assistance") Service Centres. These are sometimes called Telecentres as seen in countries like Brazil, India and Venezuela. A Thusong Service Centre provides online access to government information to the rural and underserviced communities and addresses historical, social and economic factors within these communities (GCIS, 2013). The objective was to enhance individuals' lives through online access to services from the government and this incorporated a participatory way for citizens to interact with the government. Also, assisting rural societies in the development of socio-economic initiatives that include health, education, agriculture and human settlements (Bailey and Ngwenyama, 2010).

The Thusong Service Centres provide training in ICT usage allowing citizens a prospect of improving their e-skills (Kapondera, 2014). This ICT training offer chances of employment within these centres including access to information and bringing the government to the people, saving the much-needed costs by communities (Hansson, Mozelius, Meegammana and Gaina, 2010; Kapondera, 2014).

As indicated by Kennedy and Davis (2006), the Thusong Service Centres were to fill in as a channel between government and the citizens by providing a two-way interaction stream, which would aid the government in delivering services to rural communities through ICT. The National Development Plan (2012) also argues that the promotion of inclusive rural economic development should be seen as a cornerstone in bringing stability and sustainability for the citizens of our country. By the end of June 2016, 420 Thusong Service Centres were operational across the country providing services through ICT from the following Departments: Home Affairs, Social Development, South Africa Security Agency (SASSA), South African Police Services (SAPS), Labour, Government Communication and Information Systems (GCIS), and Health (DPSA, 2016). The Thusong Service Centres initiative has not been

without challenges thus necessitating further investigation in order to model these centres into sustainable government entities. The challenges are connected to the complicated nature of e-government itself; that is, political, social, innovative, and institutional viewpoints (Weerakkody et al., 2011). These challenges require a different set of empirical evidence to be collected and considered strategically by the leadership of the Government.

The acceptance of e-government for these Thusong Service Centres has frequently been founded on the expectation of accomplishing benefits like less fraud, expanded openness, noteworthy comfort, certainty development, and cost reduction in the public sector (World Bank, 2014). Also, the use of e-government in these centres cannot be generalised as a straightforward procedure that should be possible in a present moment but instead a detailed interactive process that requires key government partners (Zakareya and Zahir, 2005). This process must include business and citizens, which explains why many government institutions are still at an early stage of e-government implementation in South Africa as seen through the Department of Home Affairs e-Citizen initiative. The e-Citizen initiative is not linked to other systems from South African Police, SARS and South African Social Security Agency (SASSA). This also requires important structural and organisational changes within these institutions so as to avoid resistance hence the need to develop an e-government implementation framework (Zakareya and Zahir, 2005).

According to the Eastern Cape Provincial Public-Sector Transformation Strategy (PSTS, 2009-2014), the Public-Sector Transformation paradigm in South Africa tackled broader service delivery challenges, and it has registered very little success in transforming the assertiveness and behaviour of public employees concerning citizen-focused processes in the delivery of services. This is characterized by the low morale of public servants and low confidence in the public service by citizens (Public Sector Transformation Strategy, 2015).

Provincially, citizens of the Eastern Cape have on several platforms complained about challenges of service delivery and the treatment they receive when interacting with government departments. The case of dysfunctional local municipalities where there are no government services delivered to the citizens including non-payment of the municipality workers is the perfect example. In addition, citizens generally view public servants as uncaring and corrupt people who are always driven by self-serving agendas (PSTS, 2009-2014).

Valdes et al. (2011) state that service delivery is guided by the demonstration of the e-government maturity which is divided into successive steps of development. Various researchers that included Layne and Lee (2001) developed a four-step model that perceive e-government maturity within organizations. This model is focusing on functionality and ability,

steadily progressing from non-ICT to integration of systems and ending up with a one-stop-shop for citizens.

Thus, this research seeks to contribute to this process of changing the government to be more citizen-focused. This will be accomplished through the detailing of an e-government implementation framework to drive service delivery. The developed framework will assist the public-sector institutions in understanding how to fully utilise ICT to revitalise business processes and improve decision making for the provisioning of services to the citizens. The study will also produce a theoretical framework explaining the challenges that impact the e-government implementation in emerging countries. The remaining sections of this chapter focus on the statement of the problem, research questions and research objectives, significance of the study, literature review, research design and methodology, delimitation of the study, ethical considerations and outline of the chapters.

1.2. STATEMENT OF THE PROBLEM

There is sufficient literature about e-government adoption and implementation studies undertaken by various authors in the past for developed countries, such as the studies by Oliveira and Martins (2011), Erind (2015) and Chong and Olesen (2017). However, as Urbina (2017) acknowledges, there is insufficient writing on e-government acceptance and implementation for developing countries. Furthermore, the existing literature in developing countries focuses on citizens and private systems of business rather than at an organisational level of government (Urbina and Abe, 2017; Jyoti and Yogesh, 2005; Rahim and Athmay, 2013). Thus, the study must concentrate on the implementation of e-government within the context of Thusong Service Centres, as the institutions of government, due to their essential role in the provisioning of services to rural communities.

A review audit conducted by the Department of Public Service and Administration (DPSA) (2018), revealed dysfunctionality within the Thusong Service Centres. This was caused by various factors, including the institutionalisation of these centres within government, ICT infrastructure, the funding model, and the state of the physical infrastructure. The report also described the Thusong Service Centres as a “proliferation of co-ordination structures across the three spheres of government that are generally ineffective.” (DPSA, 2018, p17). The National Integrated Policy Framework (DTPS, 2016) has additionally recognised a few challenges, including ICT infrastructure bottlenecks, e-government accountability and responsibility from government departments, the decentralized spending designated for e-government implementation and lack of systems interoperability. Pather and Gomez (2010) in their investigation of Thusong Service Centres raise various challenges that include: a perception that these centres do not offer adequate e-government services which stem from

below-par standards of service delivery and non-operational tools; the Thusong Service Centres are not marketing their services and are not user-friendly; and the utilization of ICT and related services among citizens is restricted to photocopying and prepaid telephone utilities at the Thusong Service Centres. Similarly, Jabbar et. al. (2010) also identified several e-government challenges in their study in Iraq that include cultural differences, leadership changes, technology disruption, and security concerns. These challenges contributed to the poor state of e-government implementation in developing countries, including South Africa.

The cause of poor implementation of e-government is often cited as being the lack of a holistic approach to e-government implementation (Angelopoulos et al., 2010). Thus, this study aims to propose an implementation framework for e-government. Attention should be given to alternate service provisioning channels and modernizations by utilising e-government within the Thusong Service Centres which could supplement the traditional roles played by the service points of departments (Mpehle, 2010). This would reduce the requirement for citizens to travel long distances to get services and information (Brinkerhof, et. al, 2016). As a result, there is a requirement to develop a framework to ensure successful e-government implementation in the Thusong Service Centres. This integrated service delivery framework should guide to the leadership of government and policymakers to improve e-government offerings from Thusong Service Centres and ensure that aspects that obstruct the implementation are addressed (Shokane, et. al. 2017). In summary, the research problem to be investigated and addressed by this study is:

Implementing e-government through Thusong Service Centres remains a challenge in South Africa.

1.3. RESEARCH QUESTIONS

1.3.1. Main Question (MQ):

To address the research problem stated in Section 1.2., the following main research question was formulated:

1) ***What are the necessary elements of a framework for the implementation of e-government as a service delivery mechanism in South Africa? (MQ)***

The provision of online government services through ICT is regarded as the cornerstone of every new developmental change. The advancement has intensely transformed the way citizens relate to the government creating opportunities for development (Dodd, 2000). So, the challenges that impact on the development of e-government can have a major impact on the government ability to deliver services to the citizens (Alshehri et al., 2010).

Moreover, e-government is more than a tool of putting government systems online but a process of transforming government. Thus, by simple automation of current government processes is not the primary solution but rather transforming the way government delivers services to the citizens, business and other government entities (Alsohybe, 2007). This requires the development of a holistic framework that can be utilised by government leaders. So, it is critical to categorize the necessary elements required for the development of a framework for the implementation of e-government as a service delivery mechanism in South Africa. Also, to identify the challenges that impact the e-government implementation in the delivery of services to the citizens. These challenges were identified through this study and should assist public institutions policymakers in driving effective e-government implementation. The study should further contribute to the theoretical understanding of e-government implementation in developing countries.

To answer the main research question, a series of sub-questions that interact with the challenges that impact e-government implementation are listed in the next section.

1.3.2. Sub-Questions:

The main research question (RQ) was answered through the following sub-questions:

1) *What are the challenges that impact on e-government implementation for the delivery of services in the Thusong Service Centres? (RQ1)*
2) *What is the role of the Thusong Service Centres in the use of e-government? (RQ2)*
3) *What role is being played by major partners in the implementation of e-government in the Thusong Service Centres? (RQ3)*

1.4. RESEARCH OBJECTIVES (RO)

The main research objective is to build an implementation framework for e-government that should drive service delivery. The framework can also be adopted by government institutions in South Africa and contribute to the e-government area of study.

To respond to the research questions, the following research objectives should be addressed:

1) *To develop a framework for the implementation of e-government as a service delivery mechanism in South Africa. (MO)*
2) *To explore the challenges that impact on e-government implementation for the delivery of services. (RO1)*
3) *To explore the role of the Thusong Service Centres in the use of the e-government. (RO2)*

4) *To identify the role played by major partners in the e-government implementation in the Thusong Service Centres. (RO3)*

1.5. LITERATURE REVIEW

1.5.1. Legislative Framework

In 2001 the South African Government endorsed an e-government policy document titled: "Electronic Government: The Digital Future – A Public Service IT Policy Framework", under the auspices of the Department of Public Service and Administration that is accountable for government IT policy formulation (DTPS, 2017). This was developed in partnership with the State Information Technology Agency which is an agency of government responsible for all ICT services in the South African public sector. The policy focuses on five primary principles named ICT House of Values (security, interoperability, elimination of duplication, economies of scale and digital inclusion) as a prerequisite for effective implementation of e-government. Later, in 2017, the Department of Telecommunications and Postal Services also presented a government gazette titled "National e-Government Strategy and Roadmap" as a review outline for the current e-government policy.

Thus, the e-government initiative is being supported and endorsed by the leadership of the government in South Africa. This includes the formation of a web portal called Batho Pele Gateway which allows citizens to interact with government through the eleven official languages (Farelo and Morris, 2002). SITA as an agency of government who is responsible for the implementation of e-government in South Africa has also established a one-stop-shop portal called e-Services where seventy online government services are provided (SITA, 2019).

Even though the policy and regulatory framework are in place South Africa still experiences challenges with the effective implementation of e-government. This has been confirmed by the latest United Nations (UN) e-government survey of 2019 in which fourteen out of sixteen low scoring countries are in Africa. The average index scores for these countries in Africa are lower than the world average. The E-Government Readiness Index (EGDI) for Africa stands at 0.34 whilst the world average is 0.55. The EGDI assesses e-government development at a national level and is based on three components: online service index, telecommunication infrastructure index and the human capital index. This shows a gap between the developed and developing countries in the implementation of e-government hence this could escalate the digital divide amongst those who have internet access and those who do not.

1.5.2. Empirical Literature

World Bank (2014) refers to e-government as the utilisation of ICT by government institutions to transform relationships between other agencies of government and citizens and business. Similarly, the Organisation of Economic Co-operation and Development (2013) outline e-government as a means of achieving better government through the utilisation of ICT. Deloitte Research Group (2010) agrees with Joseph (2017) who claims that electronic government entails the utilisation of ICT by the public institutions in the distribution of public amenities. From all these definitions that are mentioned above, three key aspects emerge (1) government, (2) use of ICT, and (3) provision of government services. Based on these three key points Reddick (2005, p13) argues that e-government can be constructed as the "use of ICT in providing improved government services".

While e-government includes an extensive variety of exercises, three unique delivery domains can be recognised as government-to-citizen (G2C), government-to-business (G2B), and government-to-government (G2G) (DTPS, 2017). E-government is not just about new systems; it is significantly more about the general population using it who need the correct capabilities (Hunnius and Schuppan, 2013). Be that as it may, it likewise calls for reconsidering ways the government operations are executed to enhance procedures (Alshehri and Drew, 2010). This study is based on the government-to-government domain in which the national, provincial and local governments in South Africa are providing e-government services through the Thusong Service Centres.

E-government is essential in the Public Administration field because of the creative, innovative ways the governments use ICT to provide services to the communities. This will likewise enhance the nature of their lives and give chances to partake in democratic establishments and procedures (Chukwuemeka et. al., 2017).

E-government cannot be viewed as a solitary advance process or executed as a unique undertaking but is developmental in nature and includes numerous phases of usage (Jayashree and Marthandan, 2010). There is also an immense amount of existing literature on this theoretical area such as that by Andersen and Henriksen (2006), Layne and Lee Maturity Model (2001), Darral West Model (2000), World Bank Model (2003) and United Nations Model (2012). The United Nation's model centred around 5 stages and is confirmed different e-government reports (UN e-government review, 2001, 2004, 2005, 2008, 2012, and 2016). The phases of the model are emerging, enhanced, interactive, transactional, and fully integrated presence.

As per the Working Group on e-Government in the Developing World (2002), there are five general classifications of objectives ordinarily pursued for e-government. The objectives are (1) forming an improved business setting, (2) clients online, not in line, (3) establishment of good governance and expansion of public participation, (4) refining the productivity and efficiency of government institutions and (5) improving the value of life for deprived communities. These objectives are supposed to be achieved and move the government beyond the simple efficiency of the process to that of global reform and development. Based on these objectives, it can be stated that e-government positively benefits every segment of government, citizens and businesses. The main objective of development is to increase access, productivity and quality of amenities to the citizens, companies and other government agencies (Alshehri and Drew, 2010). As an example, the Independent Electoral Commission (IEC) has effectively implemented an e-procurement system which is transparent for government tenders aimed at averting corruption and speedy delivery of procured goods. Nonetheless, there are some current difficulties and obstructions that prevent the execution of e-government which must be treated with the utmost care.

Thus, analysing the setting of government compelling change, the leaders need to especially recognise and break down e-government challenges that exist in their backyards. These incorporate viewpoints such as legislative challenges, economy, culture, individuals, and infrastructure (Mkude and Wimmer, 2016). Various studies that include Alshehri and Drew (2010), Nabafu and Maiga (2012), and Nkohkwo and Islam (2013) listed the challenges and obstructions that impact e-government implementation in emerging countries as technical, organisational, social and financial. In their e-government evaluation framework, Samad and Hamid (2009) likewise noticed the poor national practice of e-government supported organizations in developing countries. They connected this to the non-participatory methodology of the citizens in the implementation process and not realizing which services are accessible. The non-availability of services is also confirmed by Ran, Dwivedi and Williams (2013) as a problem that is in existence and affecting the full implementation of e-government.

Matavire et. al. (2010) additionally noticed that in the country the three government spheres had assumed a negative role in e-government implementation. This was caused by extreme and complex legislation, uncoordinated strategies, and inflexible organisational structures between these public bodies and this influenced the delivery of services to the citizens. This is based on the political term of the government executives which is set at five years and there is no guarantee for re-election. For example, the local municipalities feel that they should be autonomous in terms of ICT projects (Mawela et al., 2017). This has put a lot of pressure in dealing with national and provincial governments hence the silo implementation of e-government projects.

The South African Government published a White Paper on Transforming Public Service Delivery (Notice No. 1459 of 1997) which was named the Batho Pele ("People First") White Paper. Its motivation was to give an arrangement structure towards changing the Public Service through the presentation of eight Batho Pele principles. These principles include consultation of service users; setting service standards; increasing access; ensuring courtesy; providing information; openness and transparency; establishing mechanisms for redress; and ensuring value for money (GCIS, 2013). Introducing the white paper on changing the public sector, the government was paving the way towards taking the government to the citizens through a participatory practice, in this way expanding interest for e-government (DTPS, 2017).

Despite the expressed service delivery programme, South Africa is experiencing several challenges that relate to service delivery. These include challenges of poverty, corruption, skills shortage, illiteracy and poor governance (Statistics SA, 2017). A study conducted by Research ICT Africa in 2017 at provincial and local spheres found that users are mostly unhappy with the use of internet in seeking government services. This affects the success of utilising e-government facilities to enhance the delivery of services. Therefore, by developing an e-government implementation framework should assist the government policymakers in identifying factors that affect the effective implementation of e-government.

1.5.3. Theoretical Literature

New technology or innovation in the public sector can only be understood and used when it's widely diffused. Diffusion itself involves many steps and decisions which emanates from a series of comparisons between benefits and challenges of the invention towards the actual implementation (Hall and Khan, 2002). Thus, any adoption and implementation study is based on or can be linked to, an existing theory, concepts or constructs. This provides a researcher with necessary skills and environment to conduct the study based on existing ideas in the field (Ferreira, 2012). The underlying theories for this research will be based on the successful and unsuccessful implementations of e-government adoptions as guided by various models like the Technology Organisation Environment Framework (TOE) that was undertaken by governments worldwide including first-world countries like Australia and United Kingdom.

The TOE was chosen because of emphasis being placed upon adoption and implementation at an organisational level rather than an individual dimension. Other theory models like the Technology Acceptance Model (TAM) (Davis, 1986; Davis, 1989; Davis et al., 1989), TAM2 (Venkatesh and Davis, 2000), Unified Theory of Acceptance and Use of Technology (UTAUT)

(Venkatesh et al., 2003), Theory of Planned Behaviour (TPB) (Ajzen, 1985; Ajzen, 1991) are focusing on the user perspective (Oliveira & Martins, 2011).

The TOE framework has a strong hypothetical premise and that put it in the forefront for use in Information Systems (IS) adoption and implementation studies (Oliveira and Martins, 2011). The TOE framework can be described as a framework, which examines the process of how an organisation goes about adopting and implementing technological innovations like e-government and is largely influenced by three critical areas (1) External task environment, (2) Organisation, and (3) Technology. (See figure 1. below). The three areas framed both the opportunities and threats towards the execution of the e-government implementation initiative for the delivery of services.

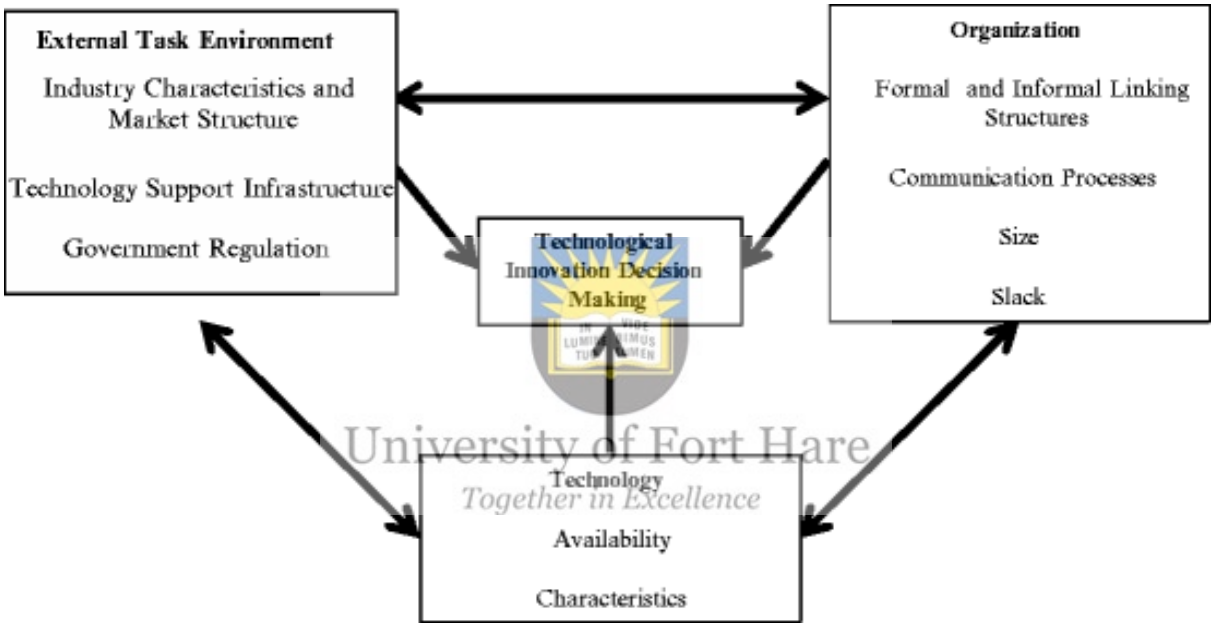


Figure 1: TOE Framework (Tornatzky and Fleischer, 1990)

Moreover, these three elements influence the way organisations realise the need to adopt and implement new technology like e-government (Tornatzky and Fleischer, 1990). Additionally, the organisational setting is characterized as far as size and degree, the intricacy of the administrative structure, quality, and attributes. Other basic aspects are the accessibility of the association's innovation and budget-related assets. In addition, there is natural (or establishment) setting, which alludes to the organisation's business and transactions with colleagues, contenders and the public sector (Tornatzky and Fleischer, 1990).

Blundell *et. al*. (1999) acknowledges that technological innovation is now recognised as an important determinant for continued superior performance whilst Rogers (2003) explain that innovation is perceived as a new impression, exercise or entity that is adopted by an individual

or an organisation. Technological innovations comprise of (1) discovering new technology or advancement in existing ICT, and (2) if unsuccessful, choosing to embrace and actualise further developed (ICT) advancements. These two components are connected however distinct.

Thomson, Pierce and Delbecq (1977) defined three stages of the adoption of technological innovations, namely: initiation (gathering and evaluation of information about the technology innovation); adoption (choice concerning the appropriation of innovative advancement); and implementation (once adoption condition is satisfied the implementation happens). These stages are supported by Darmawan (2001) however with an additional fourth phase of evaluation (assessing completed or existing projects in assisting with the challenges for future initiatives).

The theoretical literature review on technological innovation focuses mostly on the TOE framework mentioned above. Some of the studies for Information Systems adoption and implementation where TOE has gained empirical support include Zhu and Cramer (2005) who utilised the TOE system to explore forerunner effects on e-business use and business esteem in a worldwide investigation of 624 associations. Hackney et al. (2006) also utilised TOE in breaking down the selection of Web benefits in five United Kingdom (UK) firms utilizing the contextual investigation approach. Given this theoretical and literature background, the significance of the study can now be addressed.

1.6. SIGNIFICANCE OF THE STUDY

Citizen's needs have forced many public sector organisations in adopting and implementing e-government services. However, one of the challenges around this is on the availability of e-government especially for users in the rural communities. To deal with this challenge many governments have implemented various frameworks to increase access to e-government services; such frameworks include e-government service points such as Thusong Services Centres. However, little is known about the effectiveness of such frameworks. To maximize the return on the investments on such frameworks there is a need to understand what factors make them effective. This study contributes toward that goal. It is also planned to have an academic and practical contribution to e-government challenges.

1.7. RESEARCH DESIGN AND METHODOLOGY

Lankshear and Knobel (2004) define research design as a method or rule for accomplishing something under specific conditions. This is supported by Seabi (2012) in that research design is an arrangement for how one expects to achieve a specific goal, and this gives a structure

that advises the researcher concerning theories, strategies and instruments the investigation will be founded on. This study aims to develop a framework to overcome the barriers to e-government implementation in South Africa. This section provides an overview of the methodology undertaken to achieve this goal.

1.7.1. Research Paradigm and Approach (Interpretivist and Qualitative)

A research paradigm is characterised by an arrangement of calculated structures that clarify a specific hypothetical way to deal with research (Coleman, 2006) and it is an explicit method for seeing the world that shape how we look for answers to research questions. Collins and Hussey (2005) further express that the research paradigm will control the researcher when leading an exploration as indicated by a philosophical belief hidden in a particular paradigm. The three main paradigms are the positivist, interpretivist and critical.

Hudson and Ozanne (1988) clarify that the goal of the interpretivist paradigm is to realise and understand the inferences on individual behaviour instead of summing up and anticipating situations and results. They further stress that for an interpretivist researcher it is basic to appreciate points of view, suggestions, motives and other conceptual practices which time and setting are guaranteed (Hudson and Ozanne, 1988; Neuman, 2000). The motivation behind researching interpretivism is in this manner in knowledge and understanding ordinary happenings (occasions), encounters and social structures – and also, the qualities individuals join to these phenomena (Collis and Hussey, 2009).

Quantitative research utilises experimental techniques to clarify phenomena by gathering numerical information, which is generally investigated with statistically based strategies (Creswell, 2005) while qualitative research is keen on the understanding of an issue. The qualitative approach is utilised to reveal inclines in thought and feelings and drop further into the issue and the smaller sample size is often used (Stake, 2005).

So, the interpretivist paradigm and qualitative approach are ideal for this research due to complex authoritative challenges identified within the structure and culture of public sector administration. Therefore, the study required a research paradigm and approach that would enable the author to comprehend the learning, feelings, encounters, data and procedures that are incorporated into and impact e-government implementation.

1.7.2. Research Method and Design (Case Study)

The research design focuses on the outcome through a step-by-step process of achieving the end-product. The overall research process that was applied during this research study is presented in Figure 2.

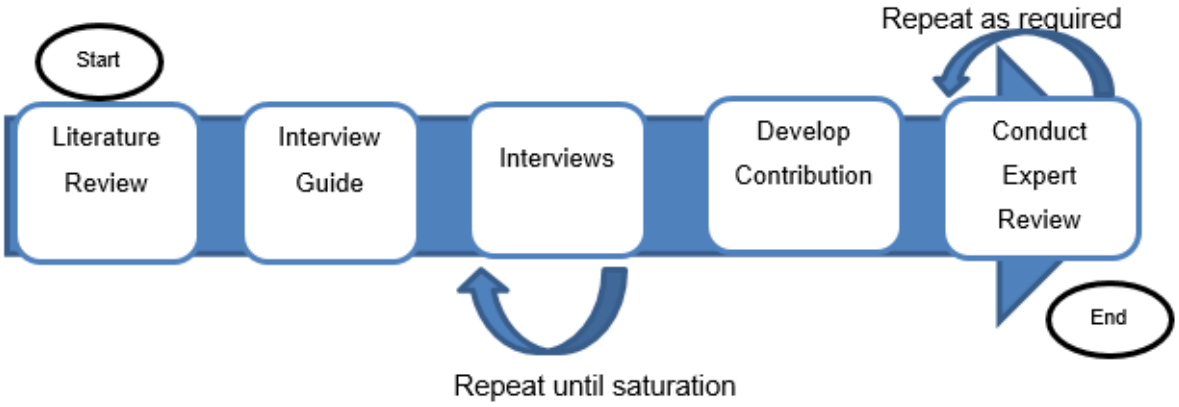


Figure 2: Research Process.

According to Benbasat et al. (1987), the research structure and technique is greatly influenced by the research problem and objectives. Yin (2003; 2009) likewise asserts that when 'how' and 'why' questions are presented, case studies are the favoured strategy. Yin (2009) further defines a case study as an experimental inquiry that investigates a modern phenomenon within its real-life context. Also, the case study is suitable for this research because gathering information and individual practices from the respondents is critical and important for assessing the problem at hand (Benbasat *et. al.*, 1987).

Yin (1994) defines three types of case studies, exploratory, descriptive and explanatory. An exploratory case study is conveyed to propose or plan another model or system with which to study another phenomenon (Yin, 1994; Saunders, 2009). This is further clarified by Saunders et al. (2003) that exploratory case study incorporates consultations with specialists of the topic or all the more by and large with individuals learned about the phenomena. Descriptive case studies centre on occasions or circumstances that have occurred previously and need to accomplish more with explicit cases (Hamel, et al., 1993).

Thus, an exploratory case study was ideal for this research because the researcher needs to construct a framework and acquire learning into the challenges of e-government implementation in the Thusong Service Centres.

1.7.3. Data Collection Methods

Data can be characterized as odds and ends of information found in nature (Merriam, 2009) while Collins and Hussey (2000) portray that research data can be primary or secondary. They further contend that essential or primary data is data created from unique sources, for example, interviews (structured, semi-structured and unstructured), while secondary data is

data that has been gathered from a current source, for example, productions, databases, and internal records, and might be accessible in a printed version or on the web.

Interviews are a data-gathering technique normally utilized by social researchers as a functioning strategy for recovering data. Berg (2004) take note of that interviews might be utilised to check distinctive social marvels and are reasonable while looking at perceptions. Yin (1994) additionally contends that interviews are the principal basis of information in qualitative research.

Simon (2011) argues that there are various approaches that a researcher can use to validate data and test its reliability, this includes receiving feedback through expert review. It is a good idea to consult experts by providing a guide to ensure they critique all important aspects of the study being reviewed. Also, software applications like NVivo can help to guarantee accuracy when analyzing the data collected.

This study made use of semi-structured interviews and expert reviews for primary data. Secondary data included data collected from various databases and publications.

1.7.4. Population and Sample

In research studies, the term population implies all individuals that meet an arrangement of determinations or a predetermined foundation and utilizing information gathered as research data. At the point when just a few components are chosen from a population, we allude to that as a sample (Alvi, 2016). It is an essential piece of any research study and is usually smaller than the aggregate number of individuals in the population.

There are two standard classifications of sampling methods, the probability sampling and non-probability sampling methods. Probability sampling is often called random sampling while non-probability sampling is sometimes called non-random sampling. These terms are substitutable.

In this research study, a non-probability (or non-random) purposive sampling method was used, the aim is to focus on particular characteristics of a population that is of interest, which would best enable the research to answer the identified research questions. The interviews were conducted and recorded with five Thusong Service Centres Managers (sampled from the 11 Centres across the Eastern Cape Province); seven Chief Information Officers from the Departments who are providing services to the Centres (namely: Home Affairs' Economic Development and Environment Affairs and Tourism; Health; Transport; Social Development; Human Settlements and Buffalo City Metropolitan Municipality); two Project Managers from SITA responsible for e-government projects and three members of the community who are

utilizing the Thusong Service Centres. For the expert review, five senior government officials provided input into the interview guide and framework to validate and refine the contribution of this study. If no new information shows up and all ideas, in principle, are well developed a saturation principle was used.

Candidates that were targeted for participation in this research were purposively selected as shown in Table 1:

Table 1: Study Participants

Category	No of Respondents
Thusong Service Centre (TSC) Managers	5
Chief Information Officers from various Government Departments (National, Provincial and Local)	7
State Information Technology Agency (SITA) Project Managers/Consultants	2
Citizens	3
Review experts	5
TOTAL	**22**

1.7.5. Data Analysis Methods

The most important area of qualitative research is the analysis of data gathered through the respondents. The accumulated data needs to be sorted out, then broken down to reach inferences on the topic of the research. Critically important is the non-numerical format of the data that catches ideas and sentiments of the respondents (Saunders et al., 2009). Analysing this data requires the grouping of the data into meaningful patterns and/or themes that were observed and according to Ryan and Bernard (2003) this involves discovering themes and sub-themes, deciding which themes are important, building hierarchies of themes, and linking these themes into a theoretical framework.

This process is the core of qualitative data analysis. For this study, content analysis was carried out by:

- Coding the data for certain words or content
- Identifying their patterns

- Interpreting their meanings.

The researcher utilised NVivo 10 tool and natural language (python) scripts to oversee and break down the vast capacity of information accumulated from the respondents. The review experts were provided with the interview questions and the completed implementation framework. This ensured a detailed critique of the critical aspects of the research study.

1.8. DELIMITATION OF THE STUDY

Concerning the approach described in the previous section, several delimitations have been made. In this study, the focus lies on the e-government initiatives in the public sector, as understood from a service delivery mechanism. Much has been written on the e-government adoption and implementation, but this study focuses on literature produced by the integration of the service delivery mechanism and e-government as seen through the Thusong Service Centres. The research also included theory from the public administration field for understanding the context of the public sector.

In the empirical case study, the focus was on internal stakeholders (SITA, National and Provincial Departments, District municipalities and the Thusong Service Centres) within the public sector who are part of the e-government service providers in the Eastern Cape Province and the Citizens that are obtaining services from these Centres. Although e-government implementation is citizen focus and for the benefits of these citizens, this study is based on government implementation at an organizational level and thus citizen-based factors are not considered. Also, external stakeholders, such as businesses, are addressed but are not the focus of the study as this group has already gained considerable attention from previous studies (Helberg, Gil-Garcia and Ferro, 2009).

1.9. ETHICAL CONSIDERATIONS

According to Oliver (2009) for any research, the researcher must research honestly and ethically. The Social Research Association (2003) likewise emphasise that the trustworthiness and manner of social research are reliant upon the aggregate conduct of individual researcher and their activities in the public arena. In this way, researchers have a commitment to adjust to the moral norms of the general public in which they direct their work.

Moral standards are imperative to stick to; reasons of why they are vital to incorporate the advancing of the examination points, for example, information, truth and evasion of blunder. In light of this, an application was made to the University Research Ethics Committee (UREC) for ethical clearance (see Appendix A – Ethical Clearance). Research can include diverse individuals in various orders, along these lines gauges to advance qualities that are basic to

community-oriented work are fundamental, morals, for example, trust, responsibility and common regard are incorporated into these principles. Moral slips by in research can essentially hurt human and creature subjects, understudies and general society.

Moral contemplations explicit to this examination are as per the following:

- The aims and objectives of this research were communicated to all the participants and the data collection procedure forwarded to the participants before the process of data collection;
- All data collected remained anonymous;
- Obtaining informed consent from all participants and anonymity has been guaranteed.
- There was a non-disclosure procedure strictly adhered to regarding the intellectual property of the organisation used within the case study;
- The institution will be allowed to review all information before being made publicly available.
- Finally, the institution will also be afforded the chance to audit all data previously being made openly accessible.

Whereby an ethical consideration is encountered during this research project, the researcher confirmed any resolution with the assistance of the university ethics committee if necessary.

1.10. STUDY CONTRIBUTION

The research study undertakes to construct a framework for e-government implementation that makes both theoretical and core contribution to the set of knowledge as deliberated in the subsequent sub-sections.

1.10.1. Theoretical Contribution

The literature review revealed whether there is any existence of a theoretical framework explaining the challenges that impact the e-government implementation in emerging countries. The framework also unveiled new factors based on the influence of the fourth industrial revolution that was previously not considered in the field of e-government. The outcomes and knowledge from the research study on the factors that impact the implementation of e-government contribute to the literature of e-government on introducing e-government into public entities of the developing countries and Africa in general. This also adopted an all-inclusive approach by investigating using the national, provincial and local entities of government. The research study also identified the theoretical relationship between the drivers and obstacles of e-government implementation and how they impact the initiative. This assisted in developing the conceptual framework that was tested through the problem area.

1.10.2. Practical Contribution

The developed e-government implementation framework should be utilised by government decision-makers in identifying critical factors that impact e-government implementation. The factors have been acknowledged through the review of the literature (chapter 2 and 3) and complemented by the empirical evidence collected from the user and government perspectives (chapter 5 and 6). The practical use of the e-government implementation framework to have an effective and efficient service delivery is also be presented. The study investigated real-world challenges as represented by the Eastern Cape Thusong Service Centres for features influencing the implementation of e-government, thereby finding solutions for the delivery of services to the citizens, businesses and other government departments.

1.11. OUTLINE OF THE CHAPTERS

The dissertation is structured as follows: **Chapter 1** introduces the background to the research and the research problem. Next, is the research objectives and the significance of the study. In **Chapter 2** the literature relevant to the study is investigated in detail focusing on the theory, principles, approaches and mechanisms associated with e-government and it further discusses e-government history and development, implementation, maturity models and frameworks. **Chapter 3** analysed and discussed the development of the research conceptual framework that was to be the theoretical base for this research. For this purpose, a Technology Organization Environment (TOE) Framework is used as an underlying theoretical model. **Chapter 4** presents the research methodology by discussing the research process used in this research. **Chapter 5** presents the preliminary findings of the case study and focuses on the Eastern Cape Thusong Services Centres as the problem area leading to **Chapter 6**, for the analysis of data that is performed for the factors relating to the e-government initiative for the sampled case study. **Chapter 7** centres around the proposed implementation framework based on the underlying theoretical background from Chapter 3 and empirical discoveries from Chapter 5 and 6. **Chapter 8** is the final chapter that concludes the study, by highlighting the contribution to knowledge made by this research, implications for the research and limitations thereof, as well as a perspective for the future research.

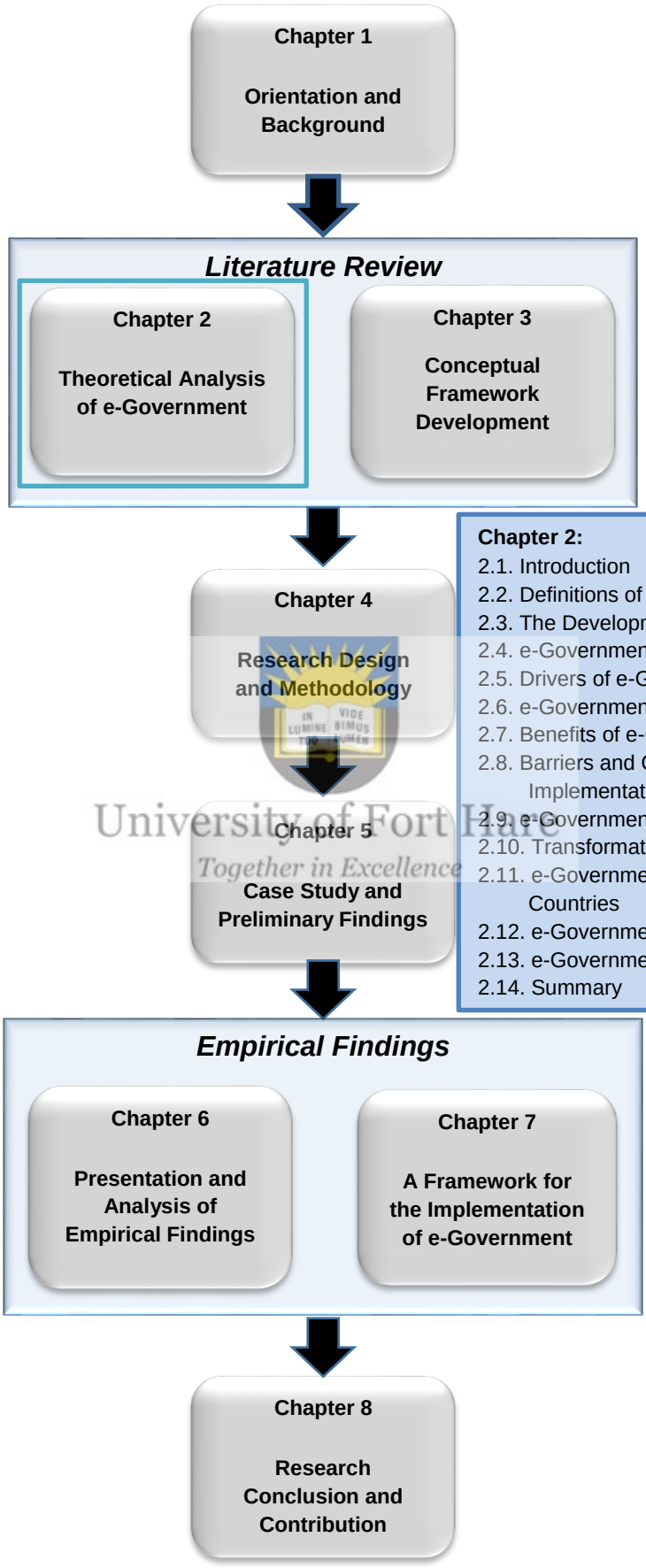
1.12. SUMMARY

In this chapter, the researcher has offered the background of the challenges affecting the implementation of e-government in South Africa through using the Thusong Service Centres as service centres of government. The researcher constructed the problem statement by analyzing the Thusong Service Centres as the problem area. The problem statement led to the main research question, research objectives and the significance of this study. A synopsis

of the literature review was presented focusing on three areas, (1) legislative framework, (2) empirical literature and (3) theoretical literature. An expected study contribution was also presented including an outline of the chapters in attaining the research objectives.

The next chapter focuses on the review of existing literature applicable to the area of research, namely e-government implementation, in developing and developed countries. This empowered the critical review of the existing literature and construction of theoretical analysis and conceptual framework in chapters 2 and 3.

CHAPTER 2 – THEORETICAL ANALYSIS OF E-GOVERNMENT



Chapter 2:

2.1. Introduction
2.2. Definitions of e-Government
2.3. The Development of e-Government
2.4. e-Government Domains
2.5. Drivers of e-Government
2.6. e-Government Maturity Stages
2.7. Benefits of e-Government
2.8. Barriers and Challenges of e-Government Implementation
2.9. e-Government and Public Service Delivery
2.10. Transformation Towards e-Government
2.11. e-Government in Developed and Developing Countries
2.12. e-Government in South Africa
2.13. e-Government in the Fourth Industrial Revolution
2.14. Summary

2.1. INTRODUCTION

The literature review chapter provides a knowledge base for the research to be performed. This empowered the researcher to appreciate the research problem and the area of research. Ferreira (2015) further points out three critical questions which need to be answered when dealing with the literature review: (1) what is previously known? (2) what is not known or what are the limitations in the existing literature? (3) how can the current study have an impact on the existing literature? Thus, this chapter analysed the literature for the research area by explaining in detail the perspectives of e-government.

The problem addressed by this study is based on the challenges of implementing e-government through the Thusong Service Centres in the country. Thus, the objective of the study is to build an implementation framework through the identification of all the factors that impact on the effective implementation of e-government. The key barrier to the implementation of e-government is often cited as being the lack of a holistic approach to e-government processes (Angelopoulos et al., 2010). As a result, there is a requirement to develop a framework to ensure successful e-government implementation in South African public services. This integrated service delivery framework should guide to the leadership of government and policymakers to improve e-government services and ensure that aspects that obstruct the implementation are addressed (Shokane, et. al. 2017). Therefore, the process of developing the implementation framework can only be achieved through the review of e-government literature which this chapter focused on. The literature review influenced the build-up to the conceptual framework which is the basis of chapter 3.

The objective of this chapter is to present the literature that should assist in the development of a conceptual framework by analyzing the development of e-government, the drivers that influence its implementation, benefits of implementing e-government and how e-government influences the delivery of services to the citizens. The chapter also detailed the status of e-government in South Africa and its role in the Fourth Industrial Revolution (4IR) emerging technologies. Firstly, section 2.2 explains the definitions of e-government as defined by various authors. This is followed by a discussion on the development of e-government (section 2.3). Section 2.4 defines the three domains of e-government as represented by government-to-citizens, government-to-business and government-to-government.

Section 2.5 deals with the drivers of e-government as experienced by other countries who are engaging in the implementation of e-government. Section 2.6 focuses on the maturity stages of e-government implementations as depicted by authors like Layne and Lee (2001). Section 2.7 identifies the benefits of implementing e-government from the viewpoint of citizens, the private sector and other government institutions and is followed by barriers and challenges

(section 2.8) that may affect the implementation of e-government in developed and developing countries. Section 2.9 identifies how e-government influences public service delivery through an effective and efficient process of provisioning of online government services by utilizing ICT while section 2.10 analyses the process of transforming governments towards e-government.

A comparative analysis between developed and developing countries concerning e-government is presented in section 2.11, followed by detailed profiling of e-government in South Africa (section 2.12). Finally, section 2.13 focuses on the role played by e-government in the 4th industrial revolution (4IR) followed by the concluding section as section 2.14.

2.2. DEFINITIONS OF E-GOVERNMENT

There is no commonly accepted definition of e-government, as various authors have focused on different elements of a definition. This section seeks to explore various definitions presented by e-government researchers to determine the most suitable definition for use in this study.

E-government has been defined as a process towards achieving a public services transformation whilst others see it as a goal in itself (Yildiz, 2007). Pardo (2000) define public administration as a complicated combination of technology, structures and processes; therefore, it involves complex cultural differences and technology advances. The growth of the Internet in governments has therefore fundamentally shifted the way of doing things and forces disruptive changes in these institutions. Holzer and Schwester (2016); Cloete (2003); Calista and Melitski (2007) define e-government as the utilisation of ICT in providing government services to citizens, business and public agencies. This view is also supported by Rorissa et al. (2011) and Lyne and Lee (2001) when they defined e-government as a conduit between government and citizens that uses ICT to provide services effectively and efficiently.

International organisations like the Organisation for Economic Co-operation and Development (OECD), the World Bank and the European Union (EU) have also shown great interest in e-government. Firstly, OECD defines e-government as the usage of ICT especially the Internet to enhance the services of government and become an improved government. However, this can be criticised because it is not clear how better government will be achieved. Secondly, the World Bank (2003) focuses on government effectiveness and efficiency, transparency and accountability by utilising ICT. The World Bank definition also focuses more on the outcomes of e-government rather than the process itself. Lastly, the European Union (2017) emphasise public sector transformation by utilising ICT to improve public policies and processes.

All these definitions include the universally agreed concepts, including utilising ICT, government efficiency and effectiveness, policies and processes, provisioning of government services, the involvement of citizens, business and other government agencies, public participation, transparency and access to information (Oyomno, 2004). Therefore, from these common concepts and definitions, for this study e-government can be defined as the electronic delivery of government information services to citizens, businesses and other government institutions for efficiency and effectiveness by utilising ICT.

It is worth noting the differences between e-government and e-governance. According to Basu (2004), e-governance stems from the term governance which is a process of enhancing management affairs of a country through political, economic and administrative means. In essence, e-governance defines processes and procedures between the government and a comprehensive environment that includes the political and social context by utilising ICT (Otubu, 2009; Bhatnagar, 2004). To understand, investigate and propose solutions regarding e-government implementation, it is important to understand the development of e-government. This is described briefly in the next section.

2.3. THE DEVELOPMENT OF E-GOVERNMENT

The emergence of Information Communication Technology (ICT) has provided many opportunities for the provisioning of quality services to the public and communities. This includes internal organisational processes for productivity (Moon, 2002). The development of the Internet by the United States Defence Force in the 1960s created unexpected support and it captured the entire world as can be seen by its popularity to this day (Ho, 2002). This rapid growth of the Internet has been influenced by the improvements in fibre networks including undersea cabling and satellite distribution by various countries across the world (Laube and Zammuto, 2003; Friedman, 2003; 2005).

There is an intertwined relationship between technology and society through all stages of human evolution. This association was initially invented through basic apparatus and continues even today, with the utilisation of the Internet (Urs, 2012). This relationship between technology and society is characterized by utilizing e-government for good public governance, transparency and accountability in the public service (Chatfield and Alanazi, 2015; Chen et al., 2015; Ciborra and Navarra, 2005). This influence of technology on societal transformation is reflected by some researchers as the driver for social and cultural standards. Urs (2012) defined this notion as technological determinism which suggests that technology is the driver and a foundation of transformation in the society.

This rapid Internet drive has also created new concepts like knowledge economy, digital economy and the information society, which define the world and the society through the abundance of information provided by the Internet (Żelazny, 2015). According to UNDP (2015), this also disrupts public administration and forces governments to rethink their systems and processes. This disruptive nature of government processes through ICT and Internet can be linked to the utilization of ICT in the provision of government services which is e-government.

According to Torres et. al. (2005), the report by the Vice President of the United States Al Gore in 1993 introduced the term e-government in which they attempted to overcome the obstacle of distance in providing services to the public by utilising ICT in government institutions. In the United Kingdom, the Tony Blair government engaged in the process of e-government through the influence of the New Public Management (NPM) to stimulate public participation in government processes (Tolbert et al., 2008). Whereas, in developing countries, like Saudi Arabia, the e-government concept was adopted in the mid-2000s (Yesser Program, 2014). The South African government endorsed their e-government policy in 2001 and this is discussed in detail in section 2.12.2.

Governments across the globe have been stimulating the provisioning of their services by utilising technology for the past 20 years. This means that ICT has been central in government business to offer services to the citizens. Governments are also prioritising the use of ICT for seamless delivery of their services through their financial and political agendas (Stoltzfus, 2005). The broader e-government definitions from the previous section reflect the agenda and priorities of government plans for the delivery of services to citizens, business and other government stakeholders as revealed by InfoDev (2002); Liikanen (2003); Zulu and Bwalya (2012). Governments across the world are prioritising this technology-driven change or transformation hence the various concepts of e-government, e-governance, digital government and digital transformation in government. This digital transformation in government is driven by three domains as defined in the next section.

2.4. E-GOVERNMENT DOMAINS

The previous sub-section reveals that e-government has been defined from three domains where the interaction involves a relationship based on the provisioning of government services between government and citizens (G2C) (as an example, an online system such as e-filing that is used by SARS for revenue collection), government to government (G2G) (as an example, e-Disclosure which is an online system used by public servants to disclose their credibility in government), and government to business (G2B) (as an example, e-procurement used by private service providers in doing business with government) by utilising ICT services.

These three domains are further discussed in the following sub-sections:

2.4.1. Government-to-Citizen (G2C) Domain

Implementation of e-government will improve the delivery of quality services to the citizens and change citizen's views about government and thereafter reclaim public belief and assurance for service delivery. This strengthens active public participation by the citizens in government processes for the better government (Reffat, 2003). The public participation is enhanced by e-government through a single point of access which allows citizens to voice out their needs more appropriately (Ndou, 2004). So, the government-to-citizen (G2C) domain signifies an interaction between government entities and citizens.

2.4.2. Government-to-Government (G2G) Domain

The anticipation of any citizen is to have access to government information and services from a single integrated source. Customer-centric organisations achieve greater success both within the government and in serving the public (DPSA, 2017). So, the G2G relations are an electronic interaction between organs of governments and their respective units including other institutions of government (Chan and Chung, 2002). This is the government's commitment to making services more friendly, convenient, transparent, and inexpensive.

2.4.3. Government-to-Business (G2B) Domain

The prospect of interacting with government through online business transactions enhances effectiveness for businesses thereby streamlining regulatory procedures and promotes transparency further assisting businesses to become more economical. The delivery of integrated single-source public services creates opportunities for business and government to partner together (Chen et al., 2006). The importance of the G2B domain is noticeable in the associations between entities of government and businesses (Carter and Belanger, 2004). The G2B domain is a two-way reversible interaction between government and businesses, that is, government-to-business (G2B) and business-to-government (B2G). G2B deals with government informing businesses about rules and regulations of e-government, whilst B2G focuses on the provisioning of goods and electronic services by businesses to the government (Huang and Bwoma, 2003). G2B is considered extremely critical for e-government due to the efficiencies of the public service in partnering with private business (Heeks, 2006).

The three domains drive the government to develop, through e-government, a holistic integrated service delivery framework for the benefit of citizens, business and other government institutions. The benefits of the planned service delivery framework are the reduction of the workload for government in the provisioning of information and services to

citizens, business and government entities without any boundaries (Reffat, 2003). Furthermore, various factors drive governments to implement e-government, which is the focus of the next section.

2.5. DRIVERS OF E-GOVERNMENT

In the preceding sub-section, the three-domain approaches of e-government between governments, citizens and business have been defined. This sub-section seeks to answer the question of why governments choose to implement e-government. In other words, what drives governments to initiate e-government? According to Meijer and Zouridis (2004), e-government implementation is different from country to country and this variance is caused by various factors that include the drivers to perform the initiative. Therefore, the acknowledgement of possible drivers that impact the implementation of e-government in South Africa signifies an opportunity for government policymakers. This should also enhance the possibility of successful implementation by refining the recognised drivers.

A survey conducted by Flak et al. (2005) found that there are two distinct motivators or drivers of e-government, namely: improving efficiency; and distribution of government services without any boundaries. Gaspair (2008) went further by analysing the e-government drivers within the European Union (EU) member states and picked up the following drivers: efficient utilisation of government resources; public sector transformation; fluctuating user requirements and needs; and world economic challenges. Whilst Tassbehji and Elliaman (2006) had their focus on G2B and B2G interaction by pointing to drivers of e-government within this domain as the application and utilisation of online business transactions, Conteno et al. (2004) emphasised that the drivers of e-government should be grouped around the positive change in the public sector and the expansion of the information society.

According to Carbo and Williams (2004), the advantage of implementing e-government is driven by the need to improve the quality of services provided to citizens, increase internal productiveness and enhance development by connecting with the citizens. Furthermore, Grimsley and Meehan (2007) claim that enhancing efficiency and effectiveness, collective citizens' happiness, improving transparency and accountability and addressing citizens' demands is what drives governments to implement e-government. Seifert (2003) also agrees with Grimsley and Meehan (2007) when he outlines the possible drivers of e-government as efficiency, better-quality services, and improved citizen satisfaction. Al-Mashari (2007) also conducted a study which listed several drivers that influence e-government implementation. These drivers include a pure strategic vision with identified objectives, human resource capacity, ICT infrastructure, technological and economical establishment, legal regulatory framework and cultural consciousness.

Ndou (2004) also conducted a study based on the influences that drive e-government implementation targeting nine developing countries. These countries included Columbia, Philippines, Guatemala, Chile, Brazil, India, China, Argentina and Jamaica. The findings identified the following drivers of e-government implementation: cost-saving and efficiency improvements; quality delivery of government services to citizens; accountability and transparency; enhanced government capability; public participation; informed decision making; and utilization of ICT in provisioning of government services.

The e-government drivers are summarized through a content analysis as shown in Table 2 below.

Table 2: Summary of e-Government Drivers

Author	Efficiency	Borderless Government	Effectiveness	Transparency and Efficiency	Strategic Vision	ICT Infrastructure	Legal	Cultural Consciousness	Public Participation	Economic Challenges
Flak et al. (2005)	X		X	X						
Seifert (2003)					X				X	
Ndou (2004)	X		X	X		X	X			
Gaspair (2008)	X		X							X
Tassbehji and Elliaman (2006)			X							
Conteno et al. (2004)		X	X							
Carbo and Williams (2004)	X	X	X							
Al-Mashari (2007)					X	X	X	X		X

The above definitions revealed that the drivers of e-government can be classified into five critical categories, political, economic, social, organizational and technological as shown in Table 3. Thus, the government should prioritise the implementation of e-government when it has political, economic, social, organisation or technological pressures. E-government is considered as the motivating factor for ICT-driven public institutions that can enhance economic and social development (Stier, 2015). Moreover, to evaluate the provision of services that are delivered to citizens a suitable e-government maturity model should be proposed as explained in the next section.

Table 3: Categorised e-Government Drivers

Category	Driver
Political	• improving transparency and accountability; • addressing citizens' demands; public participation; • informed decision making; • legal regulatory framework
Economical	• improving efficiency; • enhancing effectiveness; • efficient utilisation of government resources; • cost-saving and reduction; • world economic challenges
Social	• addressing citizens' demands; • better-quality services; • improved citizens' demands and satisfaction; • public participation; • informed decision making; • improve the quality of services provided to citizens; • enhance developmental through connecting with the citizens; • cultural consciousness; • the expansion of the information society; • fluctuating user requirements and needs
Organisational	• strategic vision with identified objectives; • human resource capacity; • increase internal productiveness;

	• a positive change in the public sector; public sector transformation
Technological	• technological and economical establishment; • ICT infrastructure; • application and utilisation of online business transactions; • the utilisation of ICT in provisioning of government services

2.6. E-GOVERNMENT MATURITY STAGES

According to Fath-Allah et al. (2014), a maturity model is defined as a set of phases that governs the development of e-government processes from a basic step to an advanced stage. These phases are also supported by many researchers that include Layne and Lee (2001); Baum and DiMaio (2000); Westcott (2001); and Hiller and Belanger, (2001) who claim that the e-government process develops into several stages starting from simple Internet browsing to a fully unified prototype. These phases are intended to give implementation guidance for e-government in a phased approach starting from immaturity which is a one-way interaction to a more integrated transformational phase (Karokola and Yngström, 2017).

Five maturity models are described below to determine the similarities, differences, weaknesses and strengths of these models. This theoretical analysis will be useful in developing the conceptual framework in Chapter 3. The selected maturity models of e-government are West (2000), Layne and Lee (2001), World Bank (2003), United Nations (2012) and Alhomod *et al. (*2012).

2.6.1. West (2000) Model

The West (2000) maturity model utilises a four-stage approach and focuses on (1) a billboard to post-government information through web sites, (2) Partial-Service-Delivery where users utilise search engines for information with partial online services, (3) electronic portals (e-portals) whereby government information is available in a single government site and (4) interactive democracy where the e-portals are utilised for interactive feedbacks with the users. The model focuses on functionality and is citizen-centric. It considers the potential benefit of political changes at its highest stage.

2.6.2. Layne and Lee (2001) Maturity Model

A four-stage maturity model of e-government was developed by Layne and Lee (2001) focusing on (1) catalogue of the public information which is published on the web, (2) transaction where the citizens can perform online transactions with government, (3) vertical

integration which is the consolidation of similar systems and (4) horizontal integration of systems across government departments. The stages of the Layne and Lee (2001) maturity model focus on grouping the technical, organisational and administrative achievability with no linkage to political changes.

2.6.3. Moon (2002) Model

The Moon (2002) model has five stages which are defined as (1) simple information dissemination which is simple one-way interaction of data posted on the government websites, (2) two-way communication with an interactive interaction between governments and users utilising e-mail services and data transfer, (3) service and financial transactions in a self-service format which includes online electronic transactions, (4) integration which consolidates similar systems from various departments with sharing of data and (5) political participation which includes online voting (or e-voting). The model focuses on functionality and it considers the potential benefit of political changes.

2.6.4. World Bank (2003) Model

The World Bank (2003) developed a three-stage maturity model which focuses on (1) publish where all the government information including rules, regulations and forms is published on the government online website, (2) interact where interactive feedback on policy development is obtainable and (3) transact where users perform online transactions. The model focuses on functionality and is also citizen-centric. Additionally, the model development does consider the potential benefit of political changes.

2.6.5. United Nations (2012) Model

The United Nations (2012) created their four-stage maturity model of e-government which focuses on (1) emerging information services where stationary information is provided through government websites, (2) enhanced information services where there is a basic two-way interaction, (3) transactional services were a two-way interaction between users and government occurs and (4) connected services with active websites between users and government. The United Nations (2012) model is citizen-centric and services are customer-centric. It is also considered the potential benefit of political changes and is more popular than the others.

The selected e-government maturity models are presented in a tabular format for comparison purposes in Table 4.

Table 4: Stages of Maturity Models

Model	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
West (2000)	Billboard	Partial-service delivery	Portal	Interactive democracy	None
Layne and Lee (2001)	Catalogue	Transaction	Vertical integration	Horizontal integration	None
Moon (2002)	Simple information dissemination	Two-way communication	Service and financial transactions	Integration	Political participation
World Bank (2003)	Publish	Interact	Transact	None	None
United Nations (2012)	Emerging information services	Enhanced information services	Transactional services	Connected services	None

The following can be observed:

1) While the names of the stages differ, the functionality is similar.
2) Some models were developed before social media and other collaboration tools.
3) In most models, the initial stage is considered as the basic e-government phase for static information with one-way communication.
4) Another major similarity is that almost all of them contain a stage related to the availability of a portal (presence), citizens can interact with governments (interaction), citizens can transact with governments (transaction), and information sharing (integration).

It should be noted that the analysis of e-government maturity models contributed a great deal in this research in the assessment and diagnosis of the capability and maturity level of the problem area as represented by the Thusong Service Centres that are facing transformation challenges as applied in the detailed research analysis. The measurement of the ability of an

e-government implementation relies on certain benefits that may affect its development, which is the essence of the next section.

2.7. BENEFITS OF E-GOVERNMENT

The use of ICT in public sector transformation is enabling the transition from an industrialised economy to an information knowledge society. Wimmer et al., (2007) also confirms that the use of ICT in European governments promotes the development and affordability of the European knowledge society. A review of literature, (OECD, 2001; Heeks, 2001; Moon, 2002; Almarabeh and AbuAli, 2010; Ndou, 2004) classified the e-government benefits into five categories (1) internal, (2) operational, (3) organisational, (4) technical and (5) external. Internal include challenges of costs, internal data and organisational structures, operational focuses on processes and administrative procedures, organisational deals with organisational leadership and strategies, technical is on bridging the digital divide and external deals with external interaction with the external stakeholders.

E-government is at the heart for the use of ICT in providing government services, hence it has a prospect to enhance efficiency in government organisations and mitigate the challenges that are faced by public institutions especially in the developing countries (Schuppan, 2009). Government efficiency should result in the following benefits for citizens and businesses:

2.7.1. Benefits of E-government to Citizens and Businesses

Kostopoulos (2003) defines the purpose of e-government as a digitally transformed government that provides online services to citizens anywhere and anytime. The digital transformation of government services includes the enhancement of ICT infrastructure and reduction of ICT operational costs by consolidating similar systems from various government institutions for data governance and integration (Al-Khouri and Bal 2007; United Nations, 2003; Ndou, 2004; Chesi et al., 2005). As an example, a one-stop-shop for data collection can liberate citizens from the bondage of multiple data sources while dealing with one government.

E-government allows online transactions with various stakeholders (citizens and businesses) thereby creating a more convenient and cost-effective way of transacting (Huang et al., 2006; Alston, 2003). Moreover, stakeholders will utilise online services thereby spending less money and time. This will also streamline the processes of interacting with the government by citizens (Choudrie et al., 2004; Weerakkody et al., 2007). Therefore, e-government should allow citizens to have full access to government services anytime and anywhere.

2.7.2. Benefits of E-government to Other Government Entities

According to Andersen (2006), one of the key aspects of utilising e-government in government is the operational and strategic use of information systems to streamline business processes. Andersen (2006) further emphasises that the implementation of e-government is influenced by policy objectives of governments to enhance efficiency and effectiveness for better delivery of services. E-government will also allow the streamlining of similar government systems for better management and seamless operations. Choudrie et al. (2004) also recommend that the implementation of e-government will also improve the interactions between external and internal stakeholders in delivering government services to citizens.

One of the priorities of governments especially in developing countries is cost-cutting measures to provide services like education and health. So, e-government implementation should streamline expenditure to other areas of priorities. E-government is perceived as an innovative way of providing government services online, however, in a broader sense, it is a technology-empowered change for the betterment of delivery of services by governments. This should also enhance efficiency and effectiveness in government, reduce budget, intensify openness and streamline public administration (Bwoma and Huang, 2003; Reynolds and Regio, 2001; Davison and Martinsons, 2003; Danielson et al., 2005; West, 2004; Ndou, 2004). Any technology innovation may be obstructed by challenges and other barriers during the implementation phase hence the next sub-section.

2.8. BARRIERS AND CHALLENGES OF E-GOVERNMENT IMPLEMENTATION

It is clear that e-government has an impact when it relates to economic development through the reduction of costs and efficiency in provisioning of government services to the citizens but different challenges remain to obstruct its implementation (Al-Sebie and Irani, 2005; Gilbert *et al.,* 2004; Ndou, 2004; Jaeger and Thompson, 2003). The barriers and challenges that are experienced by e-government implementation differ in many forms and include privacy and trust challenges, collaboration, resistance to change, online delivery of government services, infrastructure and business process reengineering (Al-Khouri and Bal, 2007; Sahraoui et al., 2006; Bwoma and Huang, 2003; Choudrie et al., 2004; Chesi et al., 2005).

Various other research findings further classify these challenges into the following categories: (1) technological viewpoint, (2) organisational, (3) social, (4) financial and (5) monitoring and evaluation (Al-Shehry *et al.,* 2006; Al-Sebie and Irani, 2005; Gilbert *et al.,* 2004; West, 2004; Ndou, 2004; Jaeger and Thompson, 2003; Prins, 2001). These challenges are similar to the influential factors of TOE framework which are focusing on technological, organizational and environmental contexts. Moreover, the TOE framework can expand by including other factors

hence it is used as the basis of developing a new framework that will reveal drivers, barriers and challenges of e-government in organisations. This will influence a positive change in government. A TOE developed framework can integrate an understanding of e-government challenges at an organizational and national position. These positions are managed and controlled by dissimilar individuals (ALQahtani, 2016). For example, the three spheres of government in South Africa (National, Provincial and Local) are administered by politicians whereas at an organizational level Chief Executive Officers are responsible for the management and controlling (Abdalla, 2012). The detailed challenges and barriers are the focus of the next section.

2.8.1. Technical

2.8.1.1. ICT Infrastructure

According to Macasio (2009), ICT infrastructure is a major element of e-government implementation especially if the process is in partnership with other government institutions and business. This is supported by Ebrahim and Irani (2005) when they emphasise that ICT Infrastructure should be a precondition for any implementation of e-government. This will ensure reliability and success for e-government. Moreover, there is a greater prospect of achieving greater productivity based on a stable and scalable ICT infrastructure.

In South Africa, the official Broadband Policy (2012) and its related strategies detail various phases of enhancing broadband penetration in South Africa and its objective is to provide access to each South African by 2030 (DTPS, 2017). Minister Stella Ndabeni-Abrahams from the Department of Communications and Digital Technologies (DCDT) claims that around 22 million South Africans are still not connected to the Internet and there is a need to collaborate with the private sector to achieve the Broadband policy objectives (ITWEb, 2019).

2.8.1.2. Security, Privacy and Trust

According to many researchers (Al-Khouri and Bal, 2007; Sahraoui et al., 2006; Bwoma and Huang, 2003), security and privacy in e-government are considered as an extremely critical challenge that affects its implementation. This includes security problems like overall information security, privacy and trust. As an example, the abundance of data forces governments to create large databases that may include patient health data; and the security and privacy of these databases need to be guarded at all costs. So, constructing a compact secure setting for data governance will safeguard online transactions and individual identification (Al-Khouri and Bal, 2007; Conklin and White, 2006).

2.8.2. Organisational

2.8.2.1. Management and Leadership

Cavaness and Manoochehri (1993) define management as individual managers who have the authority to administer and implement policies and standards in an institution. This includes the governance of all projects within the organisation. E-government also needs the approval of this leadership and must be aligned to the strategic business objectives and identify all the risks about the project (Bingi, 1999; Buckhout, 1999; Sumner, 1999; Summer, 1999). Therefore, for the success of e-government implementation, the top management support is a significant factor, and it must be enforced as a governance principle.

2.8.2.2. Collaboration

Bwoma and Huang (2003) recognised that non-collaboration within government institutions is a key barrier for the implementation of e-government. Borras (2004) further suggest that common standards should be applied in developing e-government applications to enhance consolidation and interoperability with other applications. The integration of these e-government systems will allow a single point of access for all government information services. Thus, a collaboration between government institutions is of great importance for the successful implementation of e-government.

2.8.2.3. Resistance to Change and Training

According to Gasco (2007), there is a user perception that new technology substitutes the human aspect hence e-government as a new technological innovation is generally affected by this perception and causes employees to resist any change that may occur. Also, the e-government project requires the requisite skills for successful implementation (Ndou, 2004; Smith, 2002). The combination of resistance to change and policy non-enforcement will greatly affect the implementation of e-government. To remedy this situation Schwester (2009) suggests that a structured change management process coupled with holistic training should be in place for an e-government project.

2.8.3. Social

2.8.3.1. Culture

Sathe (1983) defines culture as a combination of principles, morals and norms that is common to a certain group of a society and it is a critical influence in the implementation of e-government. This assumption is based on the new technologies being introduced by e-government systems (Feng, 2003). This view is also supported by West (2001) when

associating individual behaviours with cultural variances when accepting new innovative technology. However, the difficulty is that a cultural aspect is not tangible, and it requires more robust engagement (Weisinger and Trauth, 2003).

2.8.3.2. Digital Divide

According to Gamage and Halpin (2006), the term “digital divide” emanates from the rising gap between those who have access to ICT and those who have no access at all. Most governments across the world see the digital divide as a major obstacle for socio-economic development. The International forums such as UNESCO, UNDP and World Bank are currently supporting many of these countries by providing telecommunications and other ICT related infrastructure through telecentres to bridge this technological inequality (World Bank, 2016). However, the most basic test is how to adequately and effectively extend ICT openness in rural communities. This will create a pro-poor substance with the goal that the rural underprivileged society will almost certainly take advantage of from utilising ICT.

2.8.4. Financial

Trusler (2003) identified that in the public sector other high socio-economic demands of a government take precedence in terms of financial priorities. This puts budgetary constraints on ICT-related projects in government, including e-government. Feng (2003) also states that one of the main hindrances for e-government is the lack of financial drive for new technology. These statements are also supported by Carvin et al. (2004) when they emphasise that many developing countries tend to suppress implementation of new technologies like e-government due to high budgetary costs, even when strategic plans are in place.

2.8.5. Monitoring and Evaluation

One of the key causes of e-government failure in the developing world is the lack of monitoring and evaluation. This is initially caused by the failure to align the business objectives of an organisation to the strategic goals of the technology innovation. Monitoring and evaluation is critical in that it is required in the (1) development of a business case for the justification of an e-government project, (2) allocation of much-needed funds for e-government and (3) assessment of the project progress status towards the stipulated objectives. So, e-government should be repeatedly evaluated over time. The process should include pre-analysis, implementation analysis and post-analysis (Klievink and Janssen, 2009; Concha *et al.*, 2012).

Based on the factors identified above, the barriers and challenges to e-government implementation can be summarised as shown in Figure 3.

Focus Area	Factors of Success or Failure			
Technical	ICT Infrastructure	Privacy & Security		
Organisational	Leadership	Resistance to Change	Collaboration	Training
Social	Culture	Digital Divide		
Financial	High Cost			
Monitoring & Evaluation	M&E Processes			

Figure 3: Barriers and Challenges of e-Government Implementation

These barriers and challenges affect the implementation of e-government and therefore impact on the delivery of services to citizens. The diagram in Figure 4 shows this impact as illustrated from the drivers discussed in section 2.5. The next section focuses on e-government and public service delivery.

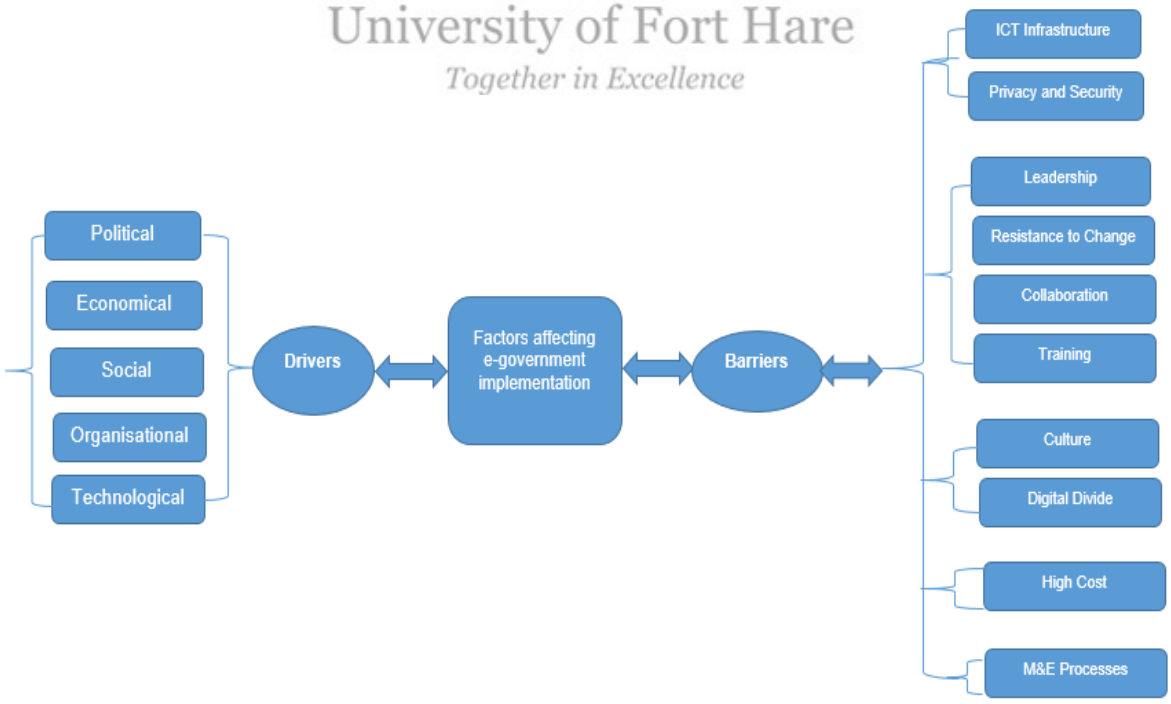


Figure 4: Drivers and Barriers that Affect e-Government Implementation

2.9. E-GOVERNMENT AND PUBLIC SERVICE DELIVERY

According to Chukwuemeka et. al. (2017), service delivery implies the amount of effort an individual or institution shows in delivering on their legislative mandate. Byars and Rue (2006) also define service delivery as a measure of an organisation in the provisioning of services to citizens through performance, efficiency and effectiveness and within the available budget and resources. Moreover, the quality of the delivery of services can be defined as the degree to which the provision of the service matches the anticipation of the consumers (Hien, 2014). Earlier in subsection 2.2, e-government was defined as the provisioning of government services efficiently and effectively by utilising ICT. Thus, provisioning of effective delivery of services through e-government is key to the functioning of government processes.

Political leadership and economists in developing countries are also in agreement in that e-government, through ICT has played a critical part in Africa's socio-economic expansion. The South African government also acknowledged through the Nation Development Plan (NDP) the role of ICT as a critical enabler for the development of the economy in the country and for fighting poverty. To support the NDP goals, initiatives that include the national broadband rollout have been initiated through the SA Connect strategy to support connectivity in schools and hospitals (Simonds, 2018).

One of the key e-government objectives is to give access to government services to citizens anytime and anywhere. This can only be achieved through the usage of several delivery networks that are available via e-government. These delivery networks depend on the utilisation of ICT to access these services. This type of access has been utilised in countries like Brazil and Venezuela in their rural communities for the delivery of these much-needed services (World Bank, 2002). Therefore, a completely implemented e-government can break the administrative blockages and transform government into a citizen-centric service delivery apparatus.

Moreover, governments in the modern world are transforming their services from being traditional to a citizen-centric e-government model of delivery (Abhichandani, 2008; Chhabra and Kumar, 2009; Hewson et al.,2004). This allows governments to be viewed as an integrated entity rather individual public service. Gronlund (2002) also states that citizen-centric e-government increases hope and confidence from citizens ensuring liability of government businesses. This should also allow improved collaboration between public entities and participants, thus allowing quick decision making and compromise (Garson,1999). Customer approval and reduced service delivery expenses could also be achieved through joint services provided by citizen-centric e-government.

2.10. TRANSFORMATION TOWARDS E-GOVERNMENT

Various models have been derived in transforming government, but this study focuses on three that were presented by Kettl (2005), namely, (1) Westminster reform strategy, (2) American model and (3) the hybrid approach. Kettl (2005) claims that the Westminster reform strategy focused on reducing the size of government by downsizing and outsourcing some government services to the non-governmental entities. The American model is based on incremental reform without reducing the size of government. The third is a combination of the Westminster strategy and reform through budget restructuring without changing the size of government.

The three transformation models identified by Kettl (2005) led to the development of a four-way topology of e-government reforms as described by Amoretti (2007). The first topology defined by Amoretti (2007) is known as reform-oriented e-government which is based on a top-down method led by strong organisational leadership. The second topology is based on the modernisation process and political control with limited participation by citizens and is known as authoritarian e-government. The third is managerial e-government and is based on the use of technology to enhance bottom-up performance in terms of maintaining budget constraints for effective delivery of services. The last and the fourth one is based on open e-government and focuses on regulatory policies and public democratic participation (Amoretti, 2007).

A close analysis of these topologies by Amoretti (2007) seems not to be exclusive to one another as most governments across the developed and developing world tend to combine two or three of these topologies as part of the adoption and introduction of e-government as discussed in the next section. However, whatever topology is being used to transform government towards e-government the main objective of the process is to deliver services to citizens effectively and efficiently.

2.11. E-GOVERNMENT IN DEVELOPED AND DEVELOPING COUNTRIES

The classification of countries as developed or developing is based on the Gross Domestic Product (GDP) per capita, cultural values, amount of economic susceptibility and human resources (UN Survey, 2018). Accenture (2010) claims that the developed countries like United States, Canada, United Kingdom, Australia, Norway and Germany have been in the forefront of e-government implementation and reaping the fruits of proper planning for the process. These countries have been rolling out significant e-government initiatives that are citizen-centred, with an efficient and effective performance by utilising the Internet (Chan et al., 2010).

Contrary to the developed countries, the developing countries are still missing (1) technological competencies (2) cultural values (3) scalable infrastructure (4) public participation and (5) human capabilities (Ndou, 2004; Chen, et al, 2006). These inequalities between developed and developing countries force governments in the developing countries to restructure their business processes to advance the adoption and implementation of e-government. Chen et al. (2006) summarise these differences between the developed and developing countries as shown in Table 5.

Table 5: Comparative analysis between developed and developing countries (Source: Chen et al., 2006)

Category	Developed	Developing
Cultural Values	• Economies of these countries have been developed immediately after independence. • Economic growth is constant with production. • Transparency in government through democratic processes	• The government is usually not specifically defined • Economic growth not increasing at an acceptable rate • Less transparency in government with a low standard of living.
Scalable Infrastructure	• Scalable infrastructure • High Internet penetration	• Bad infrastructure • Low Internet penetration
Public Participation	• High computer literacy; still has privacy challenges • More experienced in democratic processes and public participation for the policy-making process	• Do not trust online services; few citizens know how to operate computers • Relatively less experienced in democratic processes and less active participation in the governmental policy-making process
Technological Competencies	• Needs to increase technical abilities	• Does not have a staff, or has a very limited in-house staff
Government Human Capabilities	• Decent computer literacy and dedication of resources; many do place e-government as a high priority	• Low computer literacy and dedication of resources; many do not place e-government at a high priority due to lack of knowledge on the issue

According to the United Nations (2010) report, it has been established that the developed countries have been investing in digital services to support government online portals and

websites thereby encouraging online public participation. Also, the digital divide between the developed countries and developing countries is gradually closing in the e-government arena.

The e-government development index (EGDI) is a biennially presented report by the United Nations Department of Economic and Social Affairs (UNDESA) on behalf of the developed and the developing countries around e-government penetration. The EGDI indicates the e-government index based on three indexes (1) online service index, (2) telecommunications index and (3) human capital index and is similarly weighted. The latest e-government index report of 2018 is shown in Figure 5. The researcher compared the indexes between the leading developing countries Australia, USA, Germany and Canada versus the developing countries South Africa, Tanzania and Somalia as shown in figure 5.

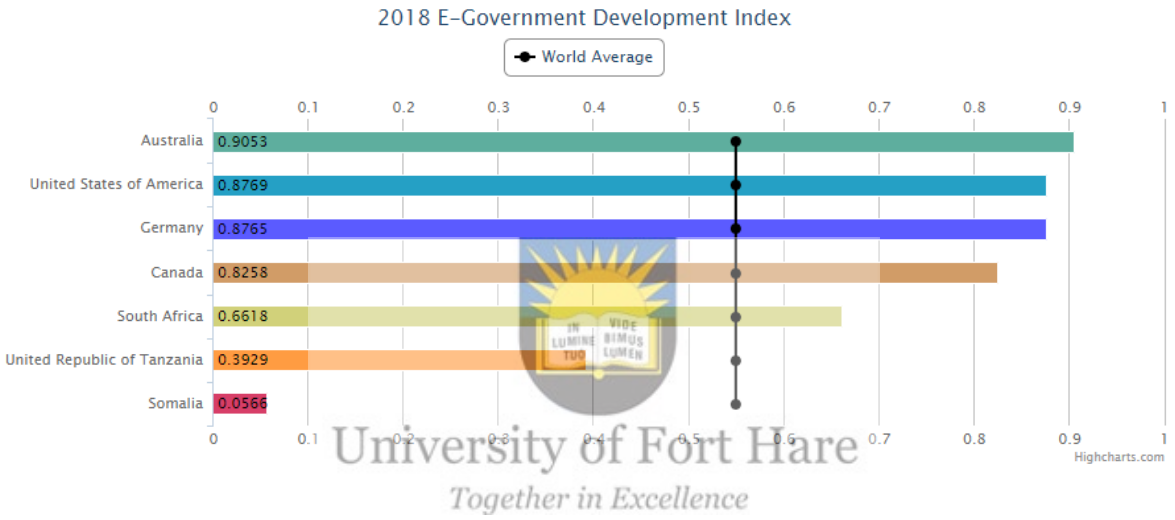


Figure 5: E-government indexes comparison between the developed and developing countries (Source: UN, 2018)

The EGDI graph clearly shows a difference between the developed and developing countries as South Africa just managed to break above the world average. Two other developing countries Tanzania and Somalia are just below the world average. Therefore, governments in the developing countries are facing difficulties in delivering government services due to limited infrastructure and technological complexities including cultural differences. An analysis of e-government in South Africa is detailed in the following section.

2.12. E-GOVERNMENT IN SOUTH AFRICA

The history of e-government in South Africa dates back to a White Paper on the Transformation of the Public Service which focused on eight Batho Pele principles. The White paper detailed the strategy and implementation plan for the transformation of the South African public service. Rakate (2006) also emphasises that the principle of Batho Pele White Paper

was to transform the public service from the original apartheid system of government into a comprehensive participatory and responsible government for all citizens.

The South Africa e-government policy (2001) also acknowledges the use of ICT in the government and defines e-government as the enhancing of delivery of government services and promotes a participatory approach to the government policy development process thereby transforming interior and exterior inter-relationships by utilising ICT. E-government is seen as not merely for implementing systems online but as a transformative process by the government to be more productive and effective (Farelo and Morris, 2006). This, therefore, means that this transformative process requires a total overhaul of business processes within government institutions including the Thusong Service Centres and how they conduct business with citizens and private entities. The e-government transformation process also requires strategic support by the legislative bodies of government as discussed in the next sub-section.

2.12.1. Legislative Mandate

The constitution of the Republic of South Africa, 1996, Act 108 of 1996 provides that the Republic of South Africa is one, sovereign and democratic state. Chapter 3, Section 40 (1) provides for three spheres of government being the national, provincial and local which are distinct, interdependent and interrelated. The same chapter in section 41(1) (h) provides for the three spheres of government to co-operate with one another in mutual trust and good faith.

Chapter 10 of the constitution also provides for public administration, with public service that must be governed by the democratic values and principles that include, but are not limited to: a high standard of professional ethics; and efficient, economical and effective use of resources. These constitutional provisions have been given effect to by the promulgation of the Public Service Act (PSA) of 1994, as amended by Act 30 of 2007. The PSA makes provision for the administration of the Public Service through the Minister of Public Service Administration (MPSA) and implementation by the Department of Public Service and Administration. The provisions of the PSA include, amongst others, the functions of government, the administration of Human Resources, national and provincial entities and the use of ICT in government. Section 3 of the Act which focuses on ICT stipulates that the MPSA is responsible for establishing norms and standards relating to:

- information management in the public service.
- electronic government; and
- transformation, reform, innovation and any other matter to improve the effectiveness and efficiency of the public service and its service delivery to the public.

2.12.2. Policy Mandate

According to Nicol (2003), the policy is a key basis of legislation and regulation and it guides the vision for ICT and is aligned to the national development goals. He further argues that legislation establishes how policy is implemented by providing the statutory foundation for the required institutions (for example, consultative, advisory and regulatory bodies) and processes (for example, licensing). Dudley and Brito (2012) further define regulations, also called administrative laws or rules, as the primary vehicles by which the government implements laws and agency objectives. They are specific standards or instructions concerning what individuals, businesses, and other organisations can or cannot do. De Vries (2010) also emphasises that effective and efficient regulations help foster innovation and good management. The table below summarises the policies and regulatory frameworks that guide ICT in South Africa.

Table 6: Policies and regulatory frameworks that guide ICT in government

Policy or Framework	Relevance to this e-Government
National Development Plan (NDP)	The NDP (NPC, 2011) envisages a "seamless information infrastructure to meet the needs of citizens, business and the public sector, providing access to the wide range of services required for effective economic and social participation – at a cost and quality at least equal to South Africa's competitors"
Provincial Development Plan (PDP)	The e-government initiative is about transforming government to be more citizen-centred and its success requires changing how the government works, how it deals with information, how officials view their jobs and interact with the public. It also requires active participation between government departments, citizens and the private sector
Public Service Regulation (PSR)	Chapter 6 of the PSR specify that the head of the department shall ensure that the acquisition, management and use of information and communication technologies by the department— (a) enhances direct or indirect service delivery to the public, including, but not limited to, equal access by the public to services delivered by the department; (b) improves the productivity of the department; (c) promotes an environmentally friendly public service, and (d) ensures cost-efficiency for the department.
National Broadband Policy (SA Connect)	The national broadband policy and the associated strategy and plan, South Africa Connect, gives expression to South Africa's vision for the country to develop a seamless information Broadband infrastructure by

	2030 that will be universally accessible across the country at a cost and quality that meets the needs of citizens, business and the public sector and provides access to the creation and consumption of a wide range of converged applications and services required for effective economic and social participation.
Provincial Broadband Master Plan	The provincial broadband master plan, therefore, seeks to provide a framework and guidance to the local Eastern Cape Government in implementing their broadband plans, provide coherence and coordination across the local governments and also opportunities to leverage provincial efforts to meet their service delivery objectives.
National e-Government Strategy	The electronic government requires all departments to manage Information Technology (IT) effectively and efficiently, taking into consideration that IT must improve the delivery of public services, the productivity of the department and the cost-efficiency of the department.
Corporate Governance of ICT Policy Framework (CGICTPF)	The executive authority and management of departments need to extend corporate governance as a good management practice to ICT (Corporate Governance of ICT).

2.12.3. Chronological Development of ICT in South Africa

Farelo and Morris (2006, p4) explain that the South African government understood the need to develop an "Information Society" and harness the power of ICTs for economic and social development for the benefit of the country and its citizens. They further emphasise that the Government plays a critical role in supporting and enabling this process and in the creation of a socially inclusive information society. Recognising this, in 1998, the Department of Public Service and Administration (DPSA) requested approval in principle of Cabinet for the addressing of the current ICT problems in the Public Service by establishing a State Information Technology (IT) Agency (SITA) outside the Public Service that will provide Information Communication Technology related services to the Public Service (Cab Memo, 1998). The State Information Technology Agency Act 88 of 1998, was approved on the 16th October 1998 and published in the Government Gazette. The DPSA was mandated with the task of managing and overseeing this Agency.

The then Department of Communications, which was later in 2014 to become the Department of Telecommunications and Postal Services (DTPS), was mandated "to create a vibrant ICT sector that ensures that all South Africans have access to robust, reliable, affordable and secure ICT services to advance socio-economic development goals and support the Africa

agenda and contribute to building a better world" (DTPS, 2000). In addressing their mandate, they established the following State-Owned Companies (SOC):

1) As early as 1992, the South African Broadcasting Corporation (SABC) corporatised the signal distribution division as SENTECH, a wholly-owned subsidiary of the Corporation. In 1996, the SENTECH Act 63 of 1996 was amended, converting SENTECH into a separate public company responsible for providing broadcasting signal distribution services as a 'common carrier' to licensed television and radio broadcasters (SENTECH, 2015).
2) In 2000, the Independent Communications Authority of South Africa (ICASA) was formed to regulate spectrum licensing, broadcasting, postal services and communications. ICASA's mandate is spelt out in the Electronic Communications Act (to be further elaborated in the chapter) for the licensing and regulation of electronic communications and broadcasting services, and by the Postal Services Act for the regulation of the postal sector. Enabling legislation also empowers ICASA to monitor licensee compliance with license terms and conditions, develop regulations for the three sectors, plan and manage the radio frequency spectrum as well as protect consumers of these services (ICASA, 2010).
3) In 2005 the Universal Service and Access Agency of South Africa (USAASA) was formed "to ensure that every man, women and child whether living in the remote areas of Kalahari or urban areas of Gauteng can be able to connect, speak, explore and study using ICT" (USAASA, 2015).

Parallel to these regulatory bodies, the Presidential National Commission on Information Society and Development (PNC on ISAD) was formed in 2001 through President Thabo Mbeki's Office ensuring that government initiatives are coordinated and that there is less wastage of funds and human resources. This gave rise to the government's commitment to promoting ICTs, to increase the pace of service delivery, economic growth and development (PNC on ISAD, 2006).

South Africa's e-Government policy (2001) was produced by the Department of Public Service and Administration (DPSA) after an extensive consultative process that consisted of six phases and ran from June 1999 to November 2000 (e-Government Policy, 2001). Three areas of focus were targeted within the e-Government policy, namely, e-Governance, e-Services and e-Business. The detailed policy imperatives will be outlined later in the chapter.

In November 2004, an ICT Charter was officially launched by the Department of Trade and Industry (DTI). The ICT Charter generally applies to all ICT sector enterprises active in the South African market. This also includes specialised and sizeable ICT-related business units

outside of the ICT sector itself, in respect of which clearly defined lines of applicability will be negotiated with the specific sectors to which those business units belong (ICT Charter, 2004).

In 2005, the amended Electronic Communications Act 36 of 2005 was introduced to promote convergence in the broadcasting, broadcasting signal distribution and telecommunications sectors. It also provides the legal framework for convergence of these sectors and to make provision for the granting of new licenses and new social obligations. In 2006 the PNC-ISAD produced a holistic ISAD Plan to articulate a vision for the type of inclusive Information Society that South Africa aspires to become and to provide a framework that will guide all initiatives in the area of building an inclusive Information Society (PNC on ISAD, 2006).

The Corporate Governance of ICT Policy Framework (CGICTPF) was officially approved in December 2012 by the former Minister of Public Service and Administration, Ms Lindiwe Sisulu. The framework acknowledged that government transformation is, at a strategic level, informed by government-wide key priority areas that have been translated into 12 strategic outcomes, guided by the Batho Pele principles of equal access to services, increased productivity and lower costs. ICT was identified as the key enabler for this transformation in its quest for service delivery (CGICTPF, 2012).

In December 2013, Cabinet approved the National Broadband Policy or SA Connect Framework as a guiding document for the Broadband project in the country. The Broadband Policy also featured as a full chapter on the economic policy framework, the National Development Plan (NDP). The NDP that "aims to eliminate poverty and reduce inequality by 2030" and states that "South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society" (NDP, 2013). The plan, as endorsed by the ruling ANC party has been earmarked as the centrepiece of its economic strategy (News24, 2013).

All of these policies and frameworks, however, acknowledged that changes in technology would require a review of the country's policy and regulatory approaches in the future. Some steps at a policy, institutional and regulatory level have already been taken in response to changes in the communications sector. For example, the broadcasting and telecommunications regulators were merged in 2000 to begin the process of streamlining the regulatory approach to the sectors. The Independent Communications Authority of South Africa (ICASA) was given the responsibility for the regulation of postal services as well. The Electronic Communications Act 36 of 2005 was enacted, advancing the process of integrating

the policy frameworks for the different sectors in recognition of convergence in the communications sector (DTPS, 2000).

In 2014, the Minister of the Department of Telecommunications and Postal Services (DTPS) commissioned a panel for the development of a white paper on ICT Policy, which should serve as a cross-cutting ICT sector policy framework required by the industry and the National Development Plan (NDP). What necessitated the policy review is that the ICT sector continues to experience major market changes and these rapid changes require a policy and law review to have a framework across the sector. Mobile technology like digital and broadband television, smartphones, tablets and new media technologies are all recent developments in this market and there was a need to take them into account as the Department was reviewing policy (DTPS, 2000).

In 2017 an e-government strategy and roadmap document was endorsed by the cabinet of the South African government to digitally transform the public service into an inclusive digital society where all citizens can benefit. The e-government strategy and roadmap then developed five guiding principles based on (1) interoperability, (2) information security, (3) economies of scale, (4) eliminate duplication and (5) digital inclusion.

2.12.4 Regulatory Frameworks and Policy for ICT in South Africa

According to OECD (2009, p6), Policy and Regulatory Framework is defined as "the existence of the necessary infrastructure which supports the control, direction or implementation of a proposed or adopted cause of action, rule, principle or law." It's a systematic approach to regulations and the means to enforce them, usually established by a government to regulate a specific activity.

2.12.4.1. Minimum Information Security Standard of 1996

The Republic of South Africa has to serve and protect its interests just like every other sovereign state in the modern world. The National Intelligence Agency (NIA) has a statutory responsibility to protect the interests of the State through counter-intelligence measures. (National Strategic Intelligence Act 39 of 1994) Counterintelligence embodies two distinctive dimensions, namely security (the defensive) and counter-espionage (the offensive dimension).

With these imperatives in mind, NIA in conjunction with the other members of the intelligence community has focused their attention on the process used to formulate and implement information security policies on a national basis. The processes being used to formulate

policies and deliver information security services must be sufficiently flexible to facilitate change.

Also, the need for secrecy and therefore information security measures in a democratic and open society with transparency in its governmental administration according to the policy proposals regarding the intended Open Democracy Act have been taken into account and the Minimum Information Security Standard (MISS) was compiled as an official government policy document on information security, which must be maintained by all institutions who handle sensitive/ classified material of the Republic. This will ensure that national interests are protected (MISS, 1996).

2.12.4.2. E-Government Public Service IT Policy Framework of 2001

The e-Government Strategy or A Public Service IT Policy Framework (2001) addresses three major challenges:

1) *E-Governance:* The application of IT to intra-governmental operations, including the interaction between central, provincial and local government. This includes paperless messaging and reporting electronic document management and archiving, integrated systems for finance, asset and human resource management (including training), as well as systems for real-time collaboration and project management, conferencing, decision support and executive information. Dash and Pani (2016) also define e-Governance as the use of ICT to improve efficiency, effectiveness, transparency and accountability of government, that is, a technology-enabled transformation of government.
2) *E-Services:* The application of IT to transform the delivery of public services from 'standing in line' to online: anytime, anywhere, by any means, and in interactive mode. The services affected include general information and regulations, education and culture, health consulting and telemedicine, benefits, taxation etc. The new delivery vehicles also offer the opportunity to let people participate in government, by collecting direct and immediate public input in respect of policy challenges, specific projects, service delivery problems, cases of corruption, and so forth.
3) *E-Business:* The application of IT to operations performed by the government in the manner of business-to-business transactions and other contractual relations. An obvious example is the procurement of goods and services by the government: e-procurement covers the steps from electronic tender to electronic payment. More cases become available for IT application with the

spread of outsourcing and the development of public-private partnerships (DPSA, 2001).

The South African Government has established statutory bodies to co-ordinating the implementation of e-government projects. Amongst these are the State Information Technology Agency (SITA) and Government Information Technology Officers Council (GITO Council). The GITO Council, which consists of national and provincial ICT officers, is responsible for consolidating and coordinating ICT initiatives in government, including e-Government, to facilitate service delivery.

2.12.4.3. ICT Charter of 2004

The main objectives of the ICT Charter, in compliance with the Broad-Based Black Economic Empowerment (BBBEE) Act 53 of 2003 are to promote and facilitate economic empowerment in the ICT sector by doing one or more of the following:

1) enabling meaningful participation of blacks in the growth of the ICT sector and, by extension, in the national economy;
2) achieving a substantial change in the racial and gender composition of ownership, management and control structures as well as in the skilled and specialist positions of new and existing enterprises;
3) increasing the extent to which black women, communities, disabled persons, workers, co-operatives and the youth participate meaningfully in all areas of the sector;
4) facilitating access to ICTs by black people, the rural and urban poor as well as other marginalised groupings, otherwise referred to as “bridging the digital divide”;
5) providing skills development and training and thereby increasing access to and participation in the national economy of South Africa by black people; and
6) providing an enabling environment for transparency, fairness and consistency when measuring and adjudicating on matters related to BEE in the ICT sector.

The core transformation indicators in the Charter include ownership, management and control. The charter aims to regulate key employment equity such as skills development, employment equity, enterprise development, and preferential procurement as social investment.
One of the key issues identified in the Charter is that empowerment is one of the primary objects of legislation governing the regulated ICT sub-sectors. These usually take the form of

encouraging ownership and control of licensed services by persons from historically disadvantaged groups, especially those promoting the empowerment and advancement of women, and encouraging the development of human resources and training (ICT Charter, 2004).

2.12.4.4. ISAD Plan of 2006

In 2002 the Presidential International Advisory Council (PIAC) on Information Society and Development (ISAD) recommended that the country should develop a plan around which all stakeholders would be rallied for the building of an Information Society and which would be a clarion call to all to ensure that activities, initiatives, projects and programmes are aligned, coordinated and integrated.

The World Summit on Information Society (WSIS), in which South Africa participated actively, in both the Geneva and Tunis sessions in 2003 and 2005, respectively instructed countries to develop national e-strategies, to guide the building of the Information Society. Emanating primarily from these processes, the South African version of the ISAD Plan was a response to the development challenges facing Information Society within the country.

The ISAD Plan identified ten pillars and five focus areas for the transformation of South Africa from an Industrial Economy to an Information-based Knowledge Economy. These pillars cut across the social and economic realities facing South Africa and act as enablers for the development of the South African Information Society:

1) Policy and Regulatory environment
2) ICT Infrastructure and Universal Access.
3) Local Content
4) Digital Inclusion and e-Awareness
5) Human Capital
6) ICT Capacity Development and R&D
7) Coordination and Integration
8) Funding
9) Institutional Mechanisms
10) Measurement of the Information Society Development in South Africa.

The purpose of the ISAD Plan is to articulate a vision for the type of inclusive Information Society that South Africa aspires to become and to provide a roadmap to guide the coordination and integration of all initiatives contributing to the building of an inclusive Information Society. Through the coordination and integration of the Pillars and Priority Focus

Areas in the respective lead Departments through the FOSAD ISAD Cluster, the PNC expects that ISAD Plan will be accelerated in South Africa (PNC-ISAD, 2006).

2.12.4.5. Policy on Free and Open Source Software of 2007

The South African Government has acknowledged, along with many industry leaders, that Free Open Source Software (FOSS) is often a viable choice, both on the desktop and in the back end. Justifications typically focus on cost, security and similar challenges. Even so, when objective technical and financial analyses are conducted to calculate the total cost of ownership, return on investment, technical performance levels, security and other measures, FOSS typically proves highly competitive (and frequently superior) across many categories of ICT. Existing Government policy on FOSS reflects such analyses.

The policy notes the following:

1) The South African Government will implement FOSS unless proprietary software is demonstrated to be significantly superior. Whenever the advantages of FOSS and proprietary software are comparable FOSS will be implemented when choosing a software solution for a new project. Whenever FOSS is not implemented, then reasons must be provided to justify the implementation of proprietary software..
2) All new software developed for or by the South African Government will be based on open standards, adherent to FOSS principles, and licensed using a FOSS license where possible.
3) The South African Government will ensure all Government content and content developed using government resources is made Open Content unless analysis on specific content shows that proprietary licensing or confidentiality is substantially beneficial.
4) The South African Government will encourage the use of Open Content and Open Standards within South Africa

Alternative business models have arisen which allow contributors to profit from their efforts without charging for the software itself, and many small and large commercial IT vendors have professional teams contributing to open source development projects (FOSS, 2007).

2.12.4.6. Corporate Governance of ICT Policy Framework of 2012

Government transformation is, at a strategic level, informed by government-wide key priority areas, the so-called “apex” priorities as outlined in the annual State of the Nation Address

(SONA) and the Government's Programme of Action (GPoA). These key priority areas have been translated into 12 strategic outcomes, guided by the *Batho Pele* principles of equal access to services, increased productivity and lowering of costs. The purpose of ICT is to serve as "enabler" for the Public Service in its quest to operationalise these key priority areas for general service delivery. The ICT House of Values (which consists of 5 building blocks – security, interoperability, reduced duplication, economies of scale and digital inclusion – to lower costs, increased productivity and citizen convenience (SITA, 2009)) depicts the values and key focus areas of ICT service delivery. These strategic outcomes, principles, values and key focus areas inform the acquisition, management and use of ICT (DPSA, 2012).

The purpose of the Corporate Governance of ICT Policy Framework (CGICTPF) is to institutionalise the governance of ICT as an integral part of corporate governance within government institutions. It provides the Political and Executive Leadership with a set of principles and practices that must be complied with, together with an implementation approach to be utilised for Corporate Governance of ICT within departments. The framework also states that the view that ICT should be governed and managed at a Political Leadership and Executive Management level is supported by international accepted good practice and standards in the form of King III Code of Good Governance, ISO 38500 Standard for the Corporate Governance of ICT, and Control Objectives of Information related Technologies (COBIT) which is a comprehensive Governance ICT Process Framework. It also places accountability for governance of ICT fully in the hands of political leadership and executive management. The Framework requires departments to implement the corporate governance of ICT (CGICT) and Governance of ICT (GICT) as an integral part of its corporate governance arrangements. A phased implementation approach is followed that should be completed by the dates indicated. These phases include deliverables as per the following:

1) Phase 1 (March 2014): Creation of an enabling environment: Implementation of the CGICT and GICT
    a. Departmental Corporate Governance of ICT Policy and Charter depicting how CGICT will be implemented and managed in the context of the department.
    b. Designation of a Governance Champion to coordinate the development and implementation of CGICT.
    c. Departmental Governance and Management of ICT Framework for the governance and management of the ICT unit by the Government Information Technology Officer (GITO).
2) Phase 2 (March 2015): Strategic alignment: Implementation of business and ICT alignment

a. ICT Strategic Plan (ICT Plan), ICT Implementation Plan (depicted in the MTEF) and ICT Operational Plan (ICT APP); which is aligned with the departmental strategic plan.
b. Optional deliverables that will allow departments to improve the articulation of ICT enablement and management of information.

3) Phase 3 (Beyond March 2015): Continuous improvement of governance and strategic alignment arrangements
    a. Continuous Improvement Roadmap depicting the department's improvement plans for its CGICT, GICT and strategic alignment arrangements to optimise ICT enablement of service delivery.

The implementation of the Framework was to be monitored for conformance by the Department Public Service and Administration (DPSA), a performance by the Department of Planning, Monitoring and Evaluation (DPME) and audited by the AG.

2.12.5. E-Government Projects in South Africa

According to the e-government strategy and roadmap (2017), there have been pockets of e-government initiatives in South Africa. These initiatives are being implemented by departments like Transport (e-Transport), Education (e-SAMS), Social Development (e-Document Flow), SARS (e-filing), Labour (u-filling) and Home Affairs (e-Home Affairs for Smart-ID). The Department of Government Communication and Information Systems (GCIS) has also created a one-stop-shop website for all the government information.

There is also a web portal in existence named Batho Pele Gateway which was launched in 2004 and guided by the Batho Pele principles framework as explained in Chapter 1.5.1. The objective of the portal was to generate a customer-focused government in the South African public service and the provision of information on government services. The portal was also based on the 11 South African official languages which formed a direct communique with the disadvantaged communities in the rural areas (DPSA, 2017).

One of the successful e-government initiatives that the country has implemented is the e-filing system from SARS. The e-filing system is a free online service for the submission and declarations of tax returns and other related services. It is used by all citizens of South Africa. This online service allows taxpayers, tax practitioners and businesses to register free of charge and submit returns and declarations, make payments and perform several other collaborations with SARS in a secure online environment (SITA, 2016).

The Department of Home Affairs has also made some strides in developing an e-Home Affairs for Smart-ID initiative. This e-government initiative is also a free online government service for the application of Smart identification card and passports. The manual application of these documents used to take four to six months to process whereas the online system takes only twenty-two days (DPSA, 2017).

SITA as the agency of government on their website (SITA, 2016) summarises these e-government initiatives through a developed framework as depicted by the diagram below (Figure 6).

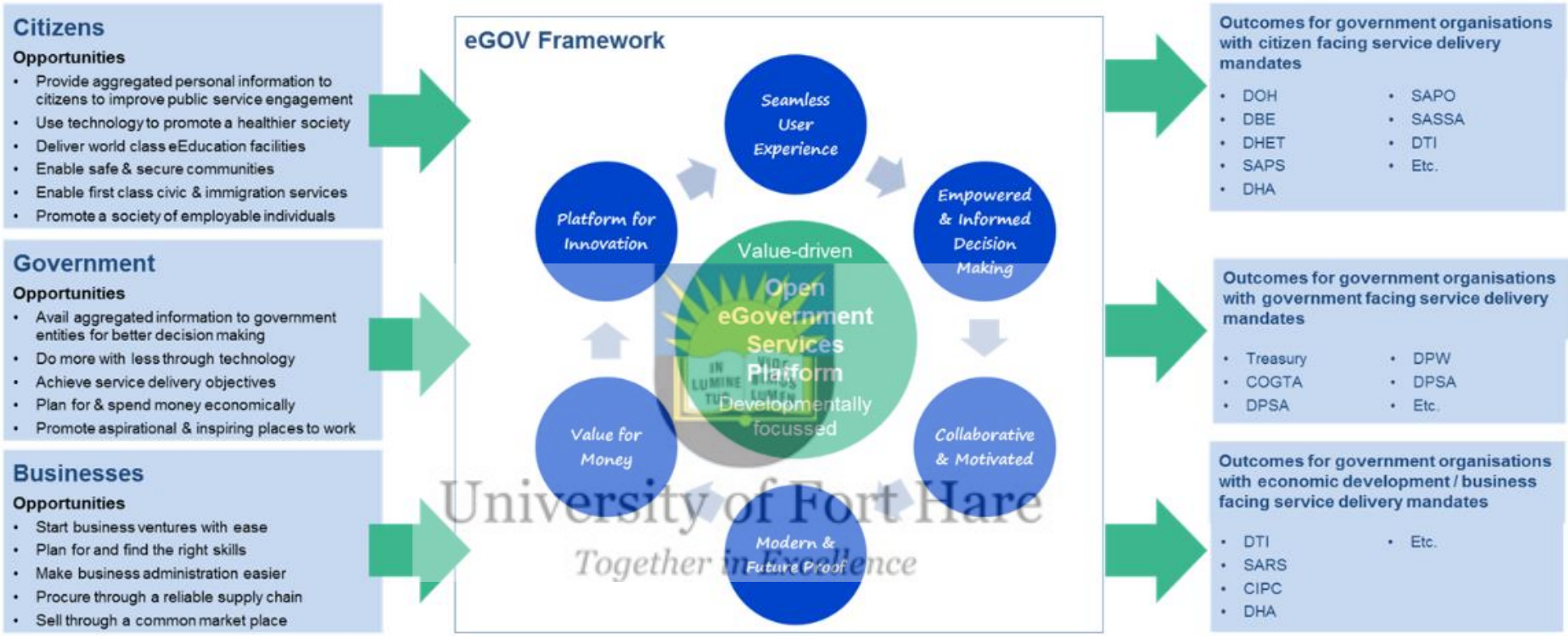


Figure 6: e-Government implementation framework (Source: SITA, 2016)

The SITA e-government framework is addressing challenges that relate to the three e-government domains as represented by citizens, government and business. It is focusing on an open e-government platform that is value-driven with areas of seamless user experience, empowered and informed decision making, collaboration, modernization and platform for innovation. It also envisaging high impact and measurable outcomes that will provide aggregated information to citizens to improve public service engagement (SITA, 2016).

The alignment of the SITA e-government framework to challenges of service delivery in the public sector is shown in figure 7 below. The citizen's requirements that involve challenges like healthcare, security, tax, social services, education are interacted through e-government by utilizing one-stop-shop portal, common and shared business processes, pro-citizens culture, integrated planning and implementation and a multi-channel approach (SITA, 2016).

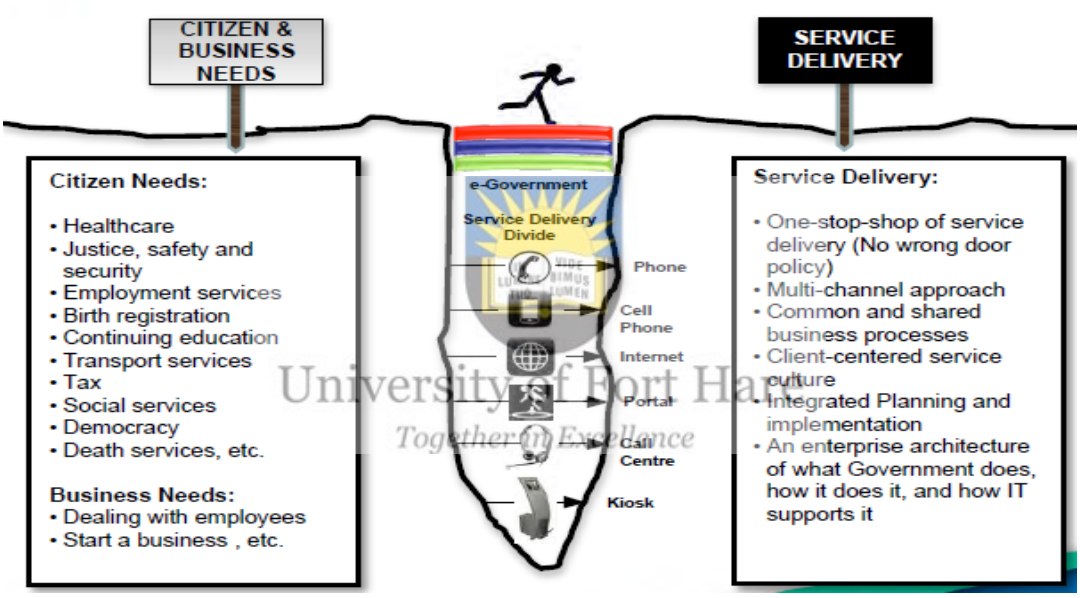


Figure 7: SITA e-Government approach to service delivery (Source: SITA, 2016)

The SITA drive for the implementation of e-government in South Africa is laudable. But what will set this new e-government initiative apart is the alignment with the current wave of the Fourth Industrial Revolution (4IR) as discussed in the next section.

2.13. E-GOVERNMENT IN THE FOURTH INDUSTRIAL REVOLUTION

The Fourth Industrial Revolution (4IR) or industry 4.0 signifies the fourth in a series of industrial revolutions, which are characterized by their ability to transform economies, jobs and even society itself through the introduction of new emerging technologies and processes (McGregor, 2017). The World Economic Forum (WEF) (2016) report stated that 4IR entails new intertwined innovative technologies that were previously fragmented that include physical,

digital and biological aspects. These new technologies are causing serious disruptions to the current business models and government plans worldwide due to the skills they require (Shava and Hofisi, 2018). But what role is e-government playing in this era of 4IR?

E-government, as defined previously in the chapter, is a technology innovation that utilises ICT in the provision of government services to citizens, business and other government entities, whereas the 4IR emerging technologies are also described as a technology innovation that makes use of the internet in providing solutions to society. McKinsey (2016) argue that both these innovative technologies can contribute positively to the delivery of services to citizens by the government. Kemp (2016) also states that governments must inquire about the impact of the new technologies in mitigating the current service delivery problems. By presenting these innovative technologies will allow governments to enhance their industrial strength whilst taking control of their technology transformation (Schwab, 2016).

The disruptive steps in the industry pushed by the fourth industrial revolution force the e-government implementations to be fast-tracked for efficiency and effectiveness of the public administration by combing the Information Technology and rapid delivery of services to the citizens (Deloitte, 2018). Public Administration is currently one of the challenging areas to-date due to these innovative changes.

South Africa as a developing country seems to be still falling behind regarding this change of the industry 4.0. It is not fully utilising the strong scientific base and innovative institutions it has to take advantage of the 4IR prospects. The government should engage with institutions of learning for the development and adoption of policies focusing on technology innovation to respond to this wave of the fourth Industrial Revolution.

According to Curran (2016), the government must aggressively and conclusively track new emerging technology innovations as provided by the fourth industrial revolution to uncover the benefits for the citizens. SITA (2016) also claim that the South African government is the largest consumer of ICT services and products, whilst DPRU (2016) found that the public service in the country is the largest employer with approximately 3 million staff members. Therefore, online facilities need to be implemented to benefit rural communities and improve their quality of life.

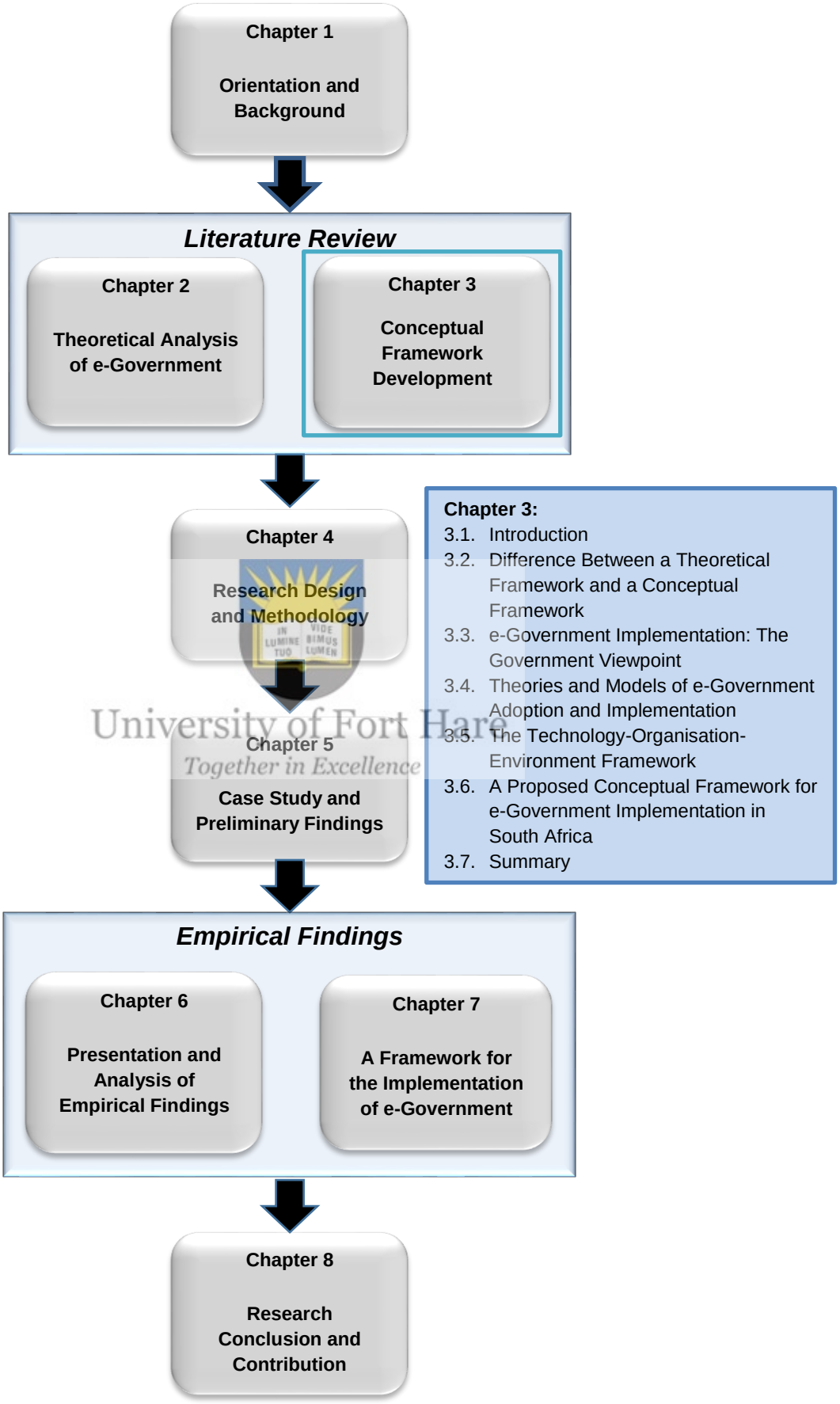
Thusong Service Centres are also a bridge between government and the rural communities making them seamless institutions for driving the aspects of the Fourth Industrial Revolution. Government including the private sector need to transform from the traditional way of doing things and focus on new innovative ways to respond to the Fourth Industrial Revolution.

2.14. SUMMARY

The literature reviewed in this chapter focused on the e-government development, concepts and characteristics. The researcher explained the factors that drive the public sector to adopt and implement e-government. The chapter also focused on the barrier and challenges that hinder a successful implementation of e-government. This was followed by a discussion on the alignment of e-government with public service delivery. A comparison between the developed and developing countries concerning e-government penetration was analysed including detailing the development and progress of e-government implementation in South Africa. Finally, the chapter explains the e-government relevancy to the fourth industrial revolution.

The main objective of this chapter is the presentation of detailed literature on e-government to establish a basis for the development of a conceptual framework as guided by the underlying TOE framework. The literature reviewed in this chapter identified factors that inhibit e-government implementation in developed and developing countries. The development of the conceptual framework as presented in the next chapter will greatly influence the solution to the research problem of the challenge of implementing e-government through Thusong Service Centres in South Africa. The next chapter deliberated and performed an in-depth review of the TOE framework as an underlying theory that is being utilised for the study for the construction of this conceptual framework.

CHAPTER 3 – CONCEPTUAL FRAMEWORK DEVELOPMENT



3.1. INTRODUCTION

As part of the literature review, the previous chapter laid a foundation regarding e-government development that includes concepts and characteristics. The factors that drive the public sector to adopt and implement e-government were discussed in detail with particular focus on the service delivery process. This study aims to develop a holistic framework for the implementation of e-government in South Africa based on factors guided by the Technology-Organisation-Environment (TOE) framework. Furthermore, some of the challenges and barriers that affect the effective implementation of e-government have been identified through the literature review in the previous chapter.

The objective of this chapter was to propose a conceptual framework for the implementation of e-government in South Africa. The conceptual framework consists of three areas as guided by technology, organisation and environmental contexts. Grant and Osanloo (2014) define a conceptual framework as a guiding map of the area to be researched. It is based on an existing underlying theory that describes the situation in the area of inquiry. Leshem and Trafford (2007) further claim that it is the blueprint that links theory to the observable data. Ravitch and Carl (2016) concur that the conceptual framework supports researchers in aligning the prescribed underlying theories with empirical data collected.

For this study, the conceptual framework development is based on the Technology-Organisation-Environment (TOE) framework as an underlying theoretical framework. The chapter detailed all the factors impacting the implementation of e-government as guided by the three contexts of the underlying TOE framework. The researcher has substantiated on the construction of the conceptual framework and how it differs from a theoretical framework. This conceptual framework is then tested in the problem area of Thusong Service Centres to identify the gap between theory and practice, thereby, identifying critical factors affecting the effective implementation of e-government in these centres.

The chapter is structured as follows: Section 3.2 analyzes the difference between theoretical and conceptual frameworks as cited by previous researchers. Section 3.3 explores the alignment between a change management process and e-government in an organization specifically focusing on the influence on the South African public sector. Section 3.4 explores the theories and models of e-government adoption and implementation processes. The detailed discussion of the TOE framework and why it was selected for this study is presented in section 3.5 and 3.6. Section 3.7 presents the proposed conceptual framework and section 3.8 summarises the chapter.

3.2. DIFFERENCE BETWEEN A THEORETICAL FRAMEWORK AND A CONCEPTUAL FRAMEWORK

According to Brondizio, Leemans and Solecki (2014), a theoretical framework is a defined theory or theories about characteristics of human or organisational experience that is valuable to a research study and is based on a standing theory. Grant and Osanloo (2014) also categorise the theoretical framework into three theoretical values that consist of constructs, concepts and occupants of theory. Adom et al. (2018) further define a theoretical framework as an existing plan that is loaned by a researcher to construct a research enquiry. Sinclair (2007) supported by Fulton and Krainovich-Miller (2010) concur with this definition by comparing the part played by the theoretical framework to that of a guiding map towards achieving the research findings. Thus, a theoretical framework guides the researcher in selecting a correct research design and data analysis strategy by focusing on the focal point in the specific field of inquiry. It also assists the researcher in identifying the type of data to be collected (Lester, 2005).

A conceptual framework, on the other hand, is a structured model that is based on concepts which a researcher can use to explain the problem area being studied (Camp, 2001). Liehr and Smith (1999) also define the conceptual framework as an integrated model that assists a researcher to explore a research problem using the researcher's design. It is structured logically to give a graphic display of the relationship between the research thoughts and ideas (Grant and Osanloo, 2014). These two types of frameworks are intertwined but have features that make them dissimilar from each other as outlined by the summary in table 7 below.

Table 7: Comparison between theoretical and conceptual frameworks (Source: Adom et al., 2018)

Theoretical Framework	Conceptual Framework
Based on standing theory/theories	Based on the concepts which are the main variables in a study
It is the underlying model of a study	It is a researcher's design model that is used to define the relationship between the research ideas
It is a well-researched theory that is developed, designed and accepted.	It is a proposal design by the researcher to answer the research problem
It offers a focal point for approaching the unknown research in a specific field of inquiry	It is the logical model that shows how the research inquiry is to be undertaken

For this chapter, a conceptual framework for the implementation of e-government was developed as a logical map that assisted the researcher with the illustration of the research problem, but first, there is a need to understand the government viewpoint on e-government implementation as detailed in the next section.

3.3. E-GOVERNMENT IMPLEMENTATION: THE GOVERNMENT VIEWPOINT

The objective of implementing e-government is based on the transformation of the public sector into an efficient and effective entity for the delivery of services to citizens, business and other government institutions. Therefore, it is critical to focus our study on the transformation of the public sector as perceived through e-government. The failure to understand and appreciate the complexities of government structure might result in an unacceptable risk of implementation failure (Irani *et al.,* 2009; Al-Khouri and Bal, 2007; Evangelidis, 2004). These complexities include challenges of management, technology, economy, social and political changes (Lee-Kelley and James, 2005; Reffat, 2003; Pardo, 2002).

By its very nature transformation is a change from a certain state to a preferred state. This is confirmed by Nelson (2003) when stating that e-government implementation focuses on organisational modification from the current state to a different anticipated state. This is based on the citizens' dynamic requirements which force institutions to react positively for the delivery of the much-needed services. These changes will be guided by the socio-economical, technological and political circumstances (Centeno *et al.*, 2005).

According to Kritsonis (2004), there has been several change management theories that have been suggested over the years which include: organisational change, system theory and social theory. The subsections which follow focus on a brief overview of change management and how it relates to the South African government.

3.3.1. Change Management Overview

According to Szamosi and Duxbury (2002), change management is the central part of any institution. Organisations that successfully achieve the change management process have benefitted strongly compared to their counterparts (Burnes, 1996a; 1996b). Nevertheless, according to Stewart and Kringas (2003), there is some difficulty within the management field when it comes to defining the terms 'change' and 'change management'.

Nickols (2004) assert that the term managing change signifies, firstly, an application of changes in a prearranged systematic manner; and secondly, the reaction to changes within an institution that the organisation has limited control of. Kotter (1996) also emphasises this control factor by elaborating that challenges endorsed by world globalisation prompt the way

these organisations behave. Thus, to prevent change management failures in organisations a precise analysis of what needs to change; what is the driver for this change; what processes are to be utilised to have a sustainable transformation; and how to deal with challenges emanating from this change needs to be identified (Palmer and Dunford 1996). Therefore, change management can be viewed as a creative process that is dynamic and is controlled by the needs of the organisation whilst preserving the organisational vision and mission. This is influenced by the change management theories that have been derived through literature as explained in the next sub-section.

3.3.2. Change Management Theories

A widely-utilised change management theoretical model for better understanding of change was developed by Lewin (1951; 1958). The model refers to a three-stage process of Unfreeze-Change-Refreeze. To initiate a successful change process, a driver for change must first be initiated. This is an unfreezing stage. The unfreezing stage is defined as taking the organisation from a condition of unwillingness to change to being prepared and eager to make the first step towards change (Lewin, 1951;1958). Robbins (2003) identified actions which stimulate the unfreezing stage as trust construction, identification of barriers and motivation-building.

The next stage is the transition or change phase leading to an expansion of new principles, beliefs and assertiveness. This change will only be implemented when there is minimal resistance within the organisation to maximise the effect of the change (Lewin, 1951; 1958). The third stage which is based on freezing is envisaged to sustain the organisation after the actual change has been executed. This includes the integration of new values and beliefs. The last stage is part of returning the organisation to stability, which guides the requirements for the next change process (Lewin, 1951;1958).

While Lewin's change model focuses on the internal organisational level changes, Lippitt *et al.* (1958) extended and modified the three-step change theory to give a comprehensive organisational change process. This captures a more detailed picture of the internal organisational change environment using seven stages (Kritsonis, 2004). The seven-stage model is based on the implementation of developing technologies like e-government and focuses on investigation, analysis, scheduling, action, stability, assessment, and finally the closure stage (Lippitt *et al.,*1958).

E-government implementation presents a unique test to change management due to the requirement of co-existence of organisation's front office and interrelated back office of ICT infrastructure (Apostolou et al., 2011). In investigating factors affecting e-government

implementation, there is a requirement to sufficiently address challenges like resistance to change. So, managing e-government implementation is customarily managing transformational change in the public sector (Saboohi and Sushil, 2010). Moreover, modifications in technology require changes in policy, culture, structure and processes of an organization (Kifle and Low Kim Cheng, 2009). Therefore, it is critical to analyse the nature of change in the South African public sector as an organization.

3.3.3. Nature of Change in the South African Public Sector

South Africa has also embarked on several changes since the dawn of democracy and these are based on social, political, economic and administrative contexts. The South African public sector transformation process has been informed by the policies of the ruling party, the African National Congress (ANC). Gumede (2013) argues that the 1992 “Ready to Govern” document by the ANC provided robust scrutiny of the socio-economic challenges that faced post-apartheid South Africa and the need to change to a new political-economic democratic state.

The government policy reforms focused on the construction of a united, non-racial, non-sexist, democratic state. These reforms are captured in various government reform programmes starting from the Reconstruction and Development Programme (RDP, 1994), followed by Growth, Employment and Redistribution (GEAR, 1996). GEAR was replaced by the Accelerated and Shared Growth Initiative of South Africa (AsgiSA, 2005) (Gumede, 2013). AsgiSA intended to accelerate the growth of South Africa’s economy, as well as accelerate wealth redistribution. However, AsgiSA was short-lived as it was soon replaced by the New Growth Path (NGP, 2010). The NGP places emphasis on job creation, the need to create decent work and a new policy orientation towards labour-intensive approaches. It aspires to grow employment by 5 million by 2020 and reduce narrow unemployment by 10% largely through a public infrastructure programme (Gumede, 2013).

In 2012, the National Planning Commission (NPC) unveiled a National Development Plan (NDP) or Vision 2030 as a building mechanism towards an envisaged end-state; where poverty, inequality and unemployment would have been drastically reduced and the efficient and effective delivery of services to the citizens would have been realised (Gumede, 2013). The NDP insisted on utilizing ICT for the delivery of these much-needed services. So, to achieve the objectives of the NDP, it is critically important to review through literature the theories and models of e-government adoption and implementation.

3.4. THEORIES AND MODELS OF E-GOVERNMENT ADOPTION AND IMPLEMENTATION

Presenting a new system or technology as an innovation process has many challenges for organisations due to various processes that the organization must adhere to. This involves developing a business case for the introduction of the new product and how it is going to impact other existing systems. This is followed by the implementation of the technology in which Al-Turki and Tand (1988) claim that the implementation process is defined by two phases of adoption and integration as shown in figure 8 below. After adoption by the users, the technology is then diffused or integrated into the entire organization (Tornatzky et al. 1983).

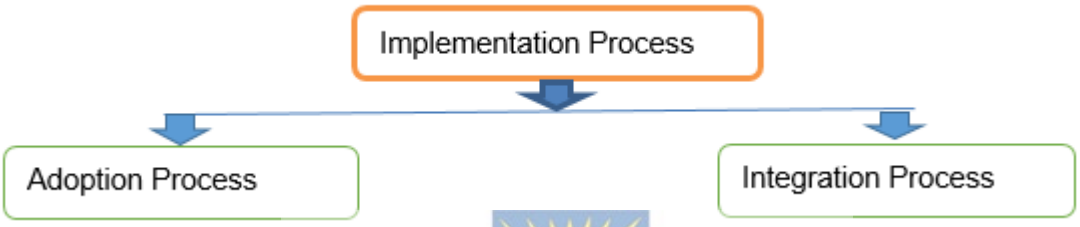


Figure 8: Implementation process

Spence (1994), however, extended the adoption process by proposing a five-stage sequential process for adoption, as shown in figure 9. The five steps include (1) awareness, (2) interest, (3) evaluation, (4) trial and (5) satisfied which applies to user perspective and beyond the scope of this study.

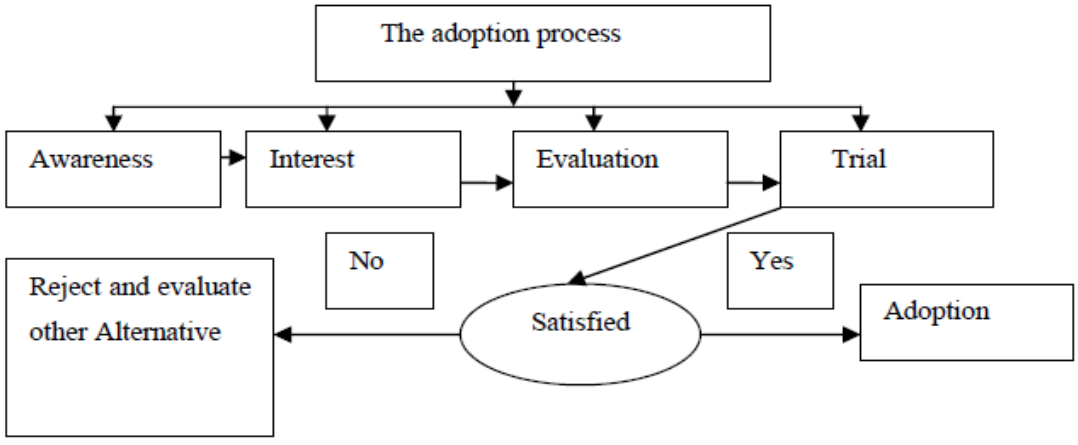


Figure 9: The adoption process (Source: Spence, 1994)

This research study is based on the development of an implementation framework for e-government as a service delivery process; thus, providing government services to citizens, business and other government entities efficiently and effectively. So, both the adoption and implementation processes will be critical for this study.

Thong and Yap (1995) also argue that the adoption and implementation of an ICT system is an organisational choice to utilise that system in the business operations of the organisation. Rogers (2003) further define the adoption and implementation of new technology like e-government as a process that involves initiation, expansion and implementation of different concepts and behaviours; whereas Spence (1994) argue that the adoption of new technology is based on an individual conceptual process.

Research studies by Moon and Norris (2005); Warkentin et al. (2002); Coursey and Norris (2008) claim that there is no clear theoretical clarification on why some governments adopt and implement a new technology innovation like e-government better than others. Hence, Ebrahim and Irani (2005) emphasise that the adoption procedure is not a forthright process that can be completed in a short space of time and it necessitates a structured architecture process.

The Information Systems (IS) adoption theories and models are subdivided into two categories based on an organisation and individuals. The individual category includes models like the technology acceptance model (TAM) (Davis, 1989), unified theory of acceptance and use of technology (UAUT) (Venkatesh et al. 2003) and task technology fit (TTF) (Goodhue and Thompson, 1995). Whereas the diffusion of innovation (DOI) (Rogers, 2003) theory and the technology-organization-environment (TOE) (Tornatzky and Fleischer, 1990) framework are widely referenced in IT/IS adoption studies at an organisational level.

The behavioural models that are based on individuals, TAM, UAUT and TTF are grounded from a psychological background theory and hence selected for investigating individual decision. They are not directly appropriate for an organisational viewpoint (Ajzen and Fishbein, 1977; Ajzen, 1991; Karahanna and Straub, 1999). TAM uses the perceived usefulness (PU) and perceived ease of use (PEOU) as the main elements for the adoption of new technology. Davis (1898) define these elements (1) PU – the perception of an individual in using a particular system for job performance, and (2) PEOU – the perception that an individual will not struggle in using a particular system hence the will to utilise it.

TAM is the most widely used model for technology adoption on an individual basis and has been frequently refined, modified and expanded hence TAM and TAM3. Some researchers (Venkatesh and Davis, 2000; Bagozzi, 2007; Venkatesh and Bala, 2008) insist that the model

has some shortfalls about some vital variables and processes for effective investigation. These shortfalls are further addressed in UAUT as an improvement to TAM, TAM2 and TAM3 (Venkatesh, Morris, Davis and Davis, 2003). The UAUT model exploits more comprehensive concepts and facilitators to cater for a broader range of uses.

Therefore, when an investigation is based on an organisational level DOI and TOE are characterised as the common theories to predict technology adoption (Oliveira and Martins, 2011; Hoti, 2015). These models adopt some specific characteristics of an organisation to conclude on technology adoption. The diffusion of innovations (DOI) theory clarifies the challenges of innovation diffusion that stimulate institutions, relative advantage, compatibility, complexity, observability and trialability.

According to Alan (2009), the DOI theory is key to an organisation for IS adoption. Rogers (2003) also argues that the adoption of an innovation is influenced by a communication process for every passage in the social system, individual challenges, internal administrative structure and the external environment that an organisation might adhere to. On the other hand, the TOE framework relies on the technology, organisation and environment for the adoption and implementation of new technology innovation (Drazin, 1991).

TOE and DOI can systematically reveal factors from inside and outside the organization and technology characteristics, but TOE does not specify individual characteristics and DOI also does not consider the influence of the environment hence DOI is not utilised in the study. The combination of the TOE and some elements of the DOI model can contribute to providing more overall factors of technology, organization, environment and individual perspective but that is beyond the scope of this study.

Several institutions and individual researchers have utilised TOE in developing adoption and implementation models that contributed theoretically on the subject of e-government. However, most of these studies are based on a citizen's perspective rather than on the government context as an organisation (Kumar et al., 2007; Moon and Norris, 2005; Altameem, 2007; Warkentin et al., 2002; Gilbert et al., 2004; Carter and Bélanger, 2005; Leila et al., 2006). This is the basis of this research study. Moreover, Ebrahim et al. (2004) claim that the adoption and implementation literature for e-government is inadequate and this is not prioritised as an urgent requirement. This shows the theoretical research gap in the literature based on the e-government adoption and implementation at an organisational level for developing countries. Hence, the TOE has been endorsed as an underlying theory for this study.

3.5. THE TECHNOLOGY ORGANISATION ENVIRONMENT FRAMEWORK

The TOE framework was developed by Tornatzky and Fleischer (1990) and its states that the decision of adopting a technological innovation by an organisation is not dependent only on the technology but also on the organisational and environmental contexts (Pudjianto and Hangjung, 2009). Srivastava and Teo (2007) also believe that an organisation's influence in adopting and implementing a technology innovation is primarily based on the three factors of technology, organisation and environment which also impacts on the organisation's effectiveness.

The first context identifies the availability of technology and its characteristics to identify all the requirements for the introduction of the new technological innovation (Hoti, 2015). The technological context contains both the internal and external systems which apply to the organisation. These technologies may contain both hardware and processes. The second aspect of the framework is based on the organisational structure as identified by the size, leadership, processes and communication procedures. The third and the last context of the framework focuses on the environment within which the organisation is conducting its business and is regulated by the government (Tornatzky and Fleischer, 1990). Therefore, the three features as shown in figure 10 present both the barriers and prospects for adoption and implementation of a new technological innovation like e-government.

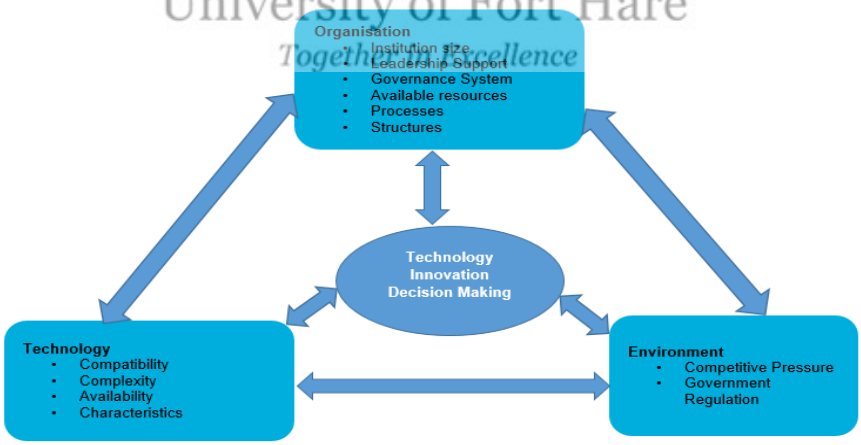


Figure 10: The Technology Organisation Environment (TOE) Framework (Source: Tornatzky and Fleischer, 1990)

3.5.1. Motivations for Selecting the Technology Organisation Environment Framework

According to Pudjianto and Hangjung (2009), the TOE framework is aligned with the research design for this study in that it is applied at two spheres, that is, national and organisational.

The national sphere is based on the economic and regulatory conditions of the country, in this case, South Africa which falls under the environmental context. The second sphere is focusing on the technological systems, leadership and management of the organisation and this falls under the technological and organisational contexts (Abdalla, 2012). This can assist in the development and integration of a suitable framework for both national and organisational levels. Moreover, the TOE permits the extension of the framework by adding more factors because of its elasticity. This suits this study as the aim of this study is to develop an implementation framework for e-government as a service delivery process in South Africa.

Previous Information Systems (IS) studies have also applied the TOE framework in dissimilar environments for adoption and implementation that include e-Business (Gibbs and Kraemer, 2004; Zhu et al., 2004), e-Data Interchange (Iacovou et al., 1995). These other studies are summarized in table 8.

Table 8: Studies using the TOE framework

Author	Focus Area	Factors
Kuan and Chau (2001)	Electronic data interchange (EDI) EDI	**Technology**: Perceived direct benefits; perceived indirect benefits. **Organisation:** Perceived financial cost; perceived technical competence. **Environment:** Perceived industry pressure; perceived government pressure.
Zhu et al. (2003)	e-Business	**Technology:** Technology competence. **Organisation:** Size; international scope; financial commitment. **Environment:** Competitive pressure; regulatory support. E- Business Value: Back-end integration; front-end functionality
Teo et al. (2006)	e-Business	**Technology:** Unresolved technical challenges; lack of IT expertise and infrastructure; lack of interoperability. **Organisation:** Difficulties in organisational change; problems in project management; lack of top

		management support; lack of e-commerce strategy; difficulties in cost-benefit assessment. **Environment:** Unresolved legal challenges; fear and uncertainty.
Pan and Jang (2008)	Enterprise Resource Planning (ERP)	**Technology:** IT infrastructure; technology readiness. **Organisation:** Size; perceived barriers. **Environment:** Production and operations improvement; enhancement of products and services; competitive pressure; regulatory policy.
Srivastava, and Teo (2010)	e-Government	**Technology:** ICT infrastructure. Organisation: Human capital. **Environment:** Public institutions; macroeconomy.
Ahmadi et al. (2017)	e-Health	**Technology:** Relative advantage; compatibility; complexity; security concern. **Organisation:** IS infrastructure support; hospital size; financial resources. **Environment:** Mimetic pressure competitors; coercive government pressure; vendor support. **Human Dimension:** Perceived technical competence of IS staff; employees' IS knowledge

Moreover, the previous studies also found that the TOE offers comprehensive knowledge on key challenges that influence the adoption of new technology innovations. The above analysis has influenced the researcher to utilise the TOE framework as the underlying theoretical model for this research. The following section defines the TOE's contextual features in detail.

3.5.2. The Technology Context

The technological context defines the usage of the current and new technologies accessible to an organisation and e-government utilises ICT for the delivery of government services which make ICT a critical component for attaining these objectives. Srivastava and Teo (2007) argue that previous studies on the use of the TOE framework for the adoption and implementation of ICT-related technology assist institutions in reaching their maximum potential.

Tornatzky and Fleischer (1990) identified four critical factors that trigger the technology context in the TOE framework as (1) compatibility, (2) relative advantage, (3) complexity and (4) trialability. Lin and Chen (2012) argue that technology dependency is effectively reduced if compatibility with existing standards is maintained. They further define complexity as the degree to which technology innovation is being utilised and realised. Rogers (2003) firstly claim that before adopting a technology innovation adopter want to understand the relative advantages that are relevant to them. Secondly, Rogers (2003) define trialability as the process of testing the existing technology innovation being adopted in a limited time.

For an effective e-government implementation, there is a requirement for an acceptable technology based on the ICT Strategy, ICT infrastructure, information and data. Alfarraj et al. (2013) also emphasise that ICT is at the centre for effective e-government implementation which includes access to Internet technologies, network connectivity, data governance and interoperability between government systems. According to Pudjianto and Hangjung (2009) technology alone and not aided by other factors like strategy, data management, policy and regulatory legislation is not sufficient for the effective implementation of ICT-related innovation technologies. Additionally, the correct alignment of existing technologies is a critical aspect of implementing new technology (Avgerou and Cornford, 1998).

The technology innovation is also changing beyond our imagination through the introduction of the fourth industrial revolution (4IR) which affects our way of doing things and behaviour for both individuals and organisations. The 4IR is defined as a combination of technology innovation that includes the physical, digital and biological technologies. The 4IR is emerging out of the third industrial revolution which is characterised by computing power and communications technology but the 4IR is considered as the disruption of technologies (Davis, 2016). The World Economic Forum (WEF, 2016), emphasises that the 4IR is driven by new technology innovations with developments in artificial intelligence, 3D printing, nanotechnology biotechnology and robotics.

Figure 11 provides a diagrammatic representation of the technology context with its factors as described in the sections which follow.

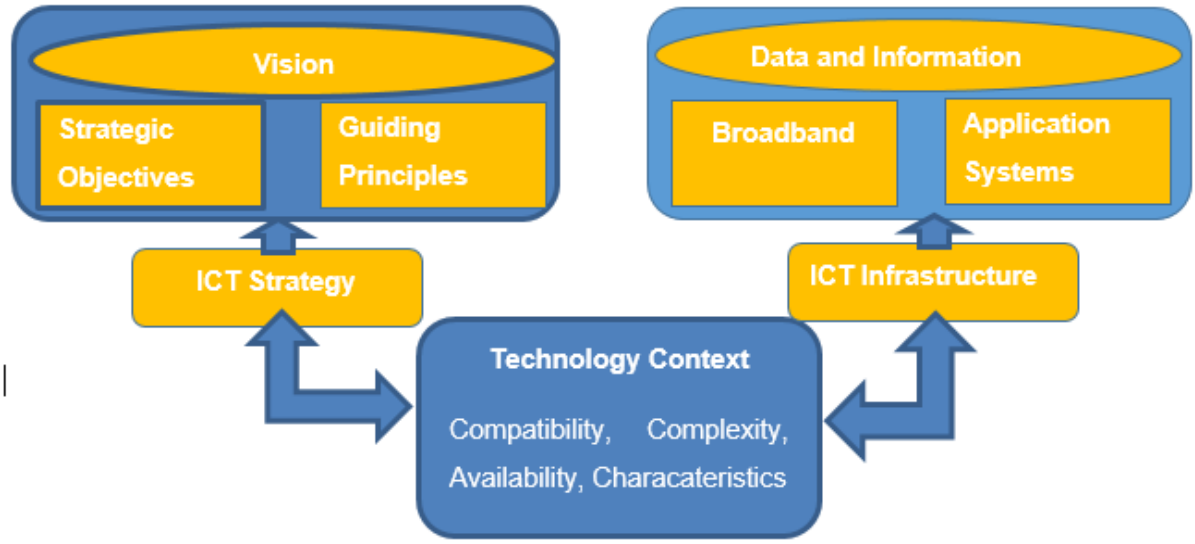


Figure 11: Technology context with its factors

3.5.2.1. The ICT Strategy Factors

Scholl (2003) defines strategy as a detailed plan that speaks to the aims and objectives of an organisation. So, developing a strategy is the first stage of effective e-government implementation. The United Nations (UN, 2014) reported that 193 countries are implementing e-government through an e-government strategy. Moreover, a holistic e-government strategy must include a vision with long-term objectives (Bekkers and Homburg, 2005; 2007; Kumar et al., 2007). Also, Ndou (2004), argues that the development of an e-government strategy as a difficult process that requires various features and processes; an all-inclusive vision and long-standing emphasis on objectives (Ndou, 2004).

The long-term objectives for the developed e-government strategy include the provisioning of online government services, the transformation of the public service and enhancing the effectiveness and efficiency of government (Parisopoulos et al., 2007; Chen et al., 2006). Additionally, the primary objective of the development of a strategy is based on stimulating e-government and promoting public engagement by the citizens on government challenges (Alshawi and Alalwany, 2009).

The South African National Government endorsed and approved the National e-Government Strategy and Roadmap on the 10th November 2017. The National e-Government Strategy and Roadmap (2017) guides the digital transformation of public service in South Africa. The objective is an inclusive digital society where all citizens can benefit from the opportunities offered by digital technologies. Thus, improving their quality of life. However, effective ICT adoption is only thinkable if a detailed implementation plan is developed to guide the process

(Pilling and Boeltzig, 2007). The vision factor of the South African e-Government strategy and roadmap is discussed in the next section.

3.5.2.1.1. The Vision Factor

According to Grant and Chau (2006), the vision factor characterises the future for the successful implementation of e-government. It offers the future status of an organisation and it is a critical aspect of e-government initiatives (Grant and Chau, 2005).

The vision for the South African e-Government Strategy and Roadmap (DCDT, 2017:14) reads as follows: “To digitize government services while transforming South Africa into an inclusive digital society and economy”. This vision is developed based on ICT being perceived as a critical enabler to provide government services efficiently and effectively while improving the association with the business and citizens. The National Development Plan (NDP, 2012) of South Africa also requires that the government utilises ICT extensively in the delivery of services and enhances the digital economy.

3.5.2.1.2. The Strategic Objectives Factor (DCDT, 2017)

The strategic objectives of the e-government strategy are:

1) **Digital Transformation** - Strengthen government policy environment to support digital transformation.
2) **E-Skills (Electronic Skills)** - Develop the capacity and skills programme that will ensure sufficient service delivery.
3) **E-Services (Electronic Services)** - Delivery of incorporated electronic services for the development of one-stop-shop for government information services.
4) **E-Access (Electronic Access)** - Access to government information and quality services by all South Africans anywhere and anytime.
5) **E-Participation (Electronic Participation)** - Encourage public participation by citizens in government affairs.
6) **Monitoring and Evaluation (M&E)** - Develop monitoring and evaluation frameworks for e-Government services.

3.5.2.1.3. Guiding Principles Factor

The e-Government Strategy and Roadmap (2017) lists six guiding principles for developing and implementing e-Government initiatives and services and are anchored on the Batho Pele ICT House Values:

1) **Interoperability** - Government ICT systems (including networks, platforms, applications and data) must have the capacity to 'talk' to each other, allowing for architected sharing and exchange of electronic messages and documents, collaborative applications, distributed data processing and report generation, seamless transaction services, 'whole-of-government' search and queries, and integrated ICT systems management.
2) **ICT security** - Government operates in an environment where electronic documents, data and ICT systems must be protected from unauthorised access, malicious code and denial-of-service attacks.
3) **Economies of scale** - Government must leverage its ICT-buying muscle to encourage compliance with other key ICT focus areas.
4) **Eliminate duplication** - Government must abolish unnecessary duplication of similar ICT functions, projects and resources (including collection, processing and archiving of the same data), as well as practices of 're-inventing the wheel'.
5) **Adopting indigenous languages in ICT applications** - The content of the e-Government services platforms and applications should be in the languages predominantly used in the provincial and local areas.
6) **Digital inclusion** - At least 75% of South Africans do not have access to ICT infrastructure (Stats SA, 2017). Failure to provide access to the previously disadvantaged communities will further impede any effort on e-government initiatives. The use of ICTs in government must ensure that all citizens have equal access.

3.5.2.2. The ICT Infrastructure Factors

Zhu and Kraemer (2005) argue that organisations with scalable ICT infrastructure have the opportunity to implement information systems. Kowtha and Choon (2001) also observed that innovation in ICT rests on the existing ICT infrastructure and seem to have an optimistic approach towards further ICT integration. Therefore, ICT infrastructure comprises physical network technology resources, application systems and processes which deliver a basis for ICT-related services.

The advances in ICT infrastructure allow the marginalised communities to have access to government services to improve their lives. ICT plays a pivotal role in the transformation of government and its much-needed services. This allows business and other government entities to interact with citizens through the usage of different ICT devices such as iPads, desktop computers, laptops, cell phones and self-service kiosks. Thus, improvement in ICT infrastructure guides the way the government services are delivered to the citizens.

3.5.2.2.1. The Broadband Factor

According to the National Broadband Policy of South Africa (2013), the policy provides a visionary South Africa with which a seamless information infrastructure is achieved by 2030 that will support “a dynamic and connected vibrant information society and a knowledge economy that is more inclusive, equitable and prosperous”. This information infrastructure will be accessible to citizens, business and other government entities. The entire ecosystem will consist of digital networks, data and information services, applications and content services (NDP, 2012).

The objectives of the NDP and the National Broadband Policy clearly shows the vision of the South African government on the Broadband initiative. However, according to Stork et al. (2013), there is not enough experimental information about South Africa’s performance regarding Broadband but there is evidence on the growing penetration regarding the mobile devices as confirmed by International Telecommunications Union (ITU, 2012) and Research ICT Africa (2012). The lack of access combined with the price of data in South Africa impacts the broadband adoption including its expansion (Chetty et al., 2012; Chen et al., 2012; WEF, 2013; Wyche et al., 2010).

3.5.2.2.2. The Application and Systems Factor

Applications and Systems are regarded as the core factors defining the functionality of e-government. They contribute to the development of the relationship between government, business and citizens (Ebrahim and Irani, 2005). The citizens’ necessities also influence governments in deploying e-government systems as confirmed by various researchers (Zhou, 2004; Bin Abdul Karim and Khalid, 2003; Wang et al., 2004). The review study by Ebrahim and Irani (2005) on e-government revealed the layered structure that consists of (1) access layer which includes communication gadgets such as, laptops, mobile phones, (2) e-government layer which include websites and portals, (3) e-business layer which include applications and systems, databases and warehouses (4) infrastructure layer which include core servers and Internet.

3.5.2.2.3. The Data and Information Factor

According to Merriam (2009) data is defined as bits and pieces of information found in an environment. McCosh et al., (1981) also defined information as any quantity of knowledge which may reasonably be useful to an individual to make a rational decision. Consequently, Gil-Garcia and Pardo (2005) advise that in the e-government setting data and information are critical in all its initiatives and this includes the management, use and sharing of this data and

information among various government entities. Hence, Redman (1996) emphasises the importance of data quality and accuracy for use within the e-government initiatives. Thus, a well-managed data and information create benefits for the public sector such as data sharing without the need to re-process the data, prevention of data duplication, and resolution of data storage problems (Dawes, 1996).

3.5.3. The Organisational Context

According to Lippert and Govindarajulu (2006), the definition of the organisational context for the TOE framework is based on the available resources to endorse and adopt the innovation. Al-Shehry (2008) further extends this definition by emphasizing the combination of standards and performance, to establish a management structure. Schein (2010) focused more on the organisational culture as the stimulant of accepting change and this entails how the organisation is structured and operates.

Various studies have shown that the failure of e-government implementation in many diverse organisations is based on the absence of commitment from the senior management leadership, absence of skills, size of the organisation, resistance to change and lack of responsiveness (AL-Shehry, 2008; Schein, 2010; Burn and Robins, 2003). These multiple factors stimulate the association between organisational context and the adoption of technology innovation (Low et al., 2011; Xu and Quaddus, 2012).

The diagrammatic representation of the organisational context with its factors as described in the sections which follow is shown in figure 12.

Figure 12: Organisational context with its factors

3.5.3.1. The Organisational Culture Factor

Burn and Robins (2003) define culture as the principles, standards and morals that are appreciated by certain members of society. Whereas Schein (2010) refers to organisational culture as a collective understanding of how an institution is structured and operates. There is also a strong relationship between organisational development and organisational culture as noticed by Burke (1994) when he argues that organisational development is a change process in an organisation's culture.

Schein (2010) formulated a model based on the relationship between organisational culture and ICT acceptance. This study was done in different government organisations and three key features were emphasized (1) basic assumptions, (2) adopted ideals and (3) objects. This model can assist institutions in managing the impact of organisational culture and observe the association between assumptions and mutual business operations within organisations. This will assist in the effective implementation and adoption of new technology innovation.

Even though the organisational culture is considered a critical aspect in influencing the adoption of new technology innovation in an organisational context there are other factors like collaboration, the share of information, experience and resistance to change which need to be considered (AL-Shehry et al., 2006; Altameem, 2007). In developing countries, the literature focused on the two factors, collaboration and resistance to change. These two factors are further discussed in the next sections.

3.5.3.2. The Resistance to Change Factor

E-government implementation is considered as a process by which an organisation's operations and processes are being transformed from the current state to a planned innovative state, so resistance from the workforce is to be anticipated. The study by Wargin and Dobiey (2001) identified various reasons that influence employees to resist any change based on new technology and these include the inadequate skills in utilising the newly introduced technology, lack of understanding the vision of the organisation and the transformation of the organisational arrangements. Luke (1982) in trying to explain this phenomenon also noticed that employees are understood to resist whatever interferes with their daily schedule.

In trying to remedy the challenge of resistance to change, Ho and Ni (2004) suggested that organisations should employ individuals with sufficient knowledge and the necessary skillset to appreciate the vision and the mission of the organisation. In doing so, it will be easy to influence and inspire others to be part of the innovation process and this would lead to an innovative institution (Altshuler and Zegans, 1990).

3.5.3.3. The Collaboration Factor

According to Ndou (2004), the collaboration between several public and private entities is critical and a beneficial factor for the distribution of resources, skills and capabilities. This is what is required for the effective implementation of e-government and government should encourage this partnership. OECD (2003) also encourages the collaborative approach for the generation of efficiency, reduction of risk and to assist a quicker and holistic rollout of e-government initiatives.

Therefore, the collaboration through shared services or integrated models of online applications and services will need sharing of architecture, standards, policies and project plans within various government entities and with the private entities. This will ensure a successful e-government implementation but to achieve this it needs a buy-in from the senior leadership of the organisation, which is the discussion of the next section.

3.5.3.4. The Senior Leadership Factor

Altameem (2007) define the senior leadership of an organisation as a collection of individuals who guide, control and monitor the operations of the organisation at the highest level. Cavaness and Manoochehri (1993) also emphasise that the senior leadership of an organisation is all the superiors who have the mandate to develop and impose policies and procedures. They lead the organisation through its vision and mission.

The senior leadership should possess strategic and leadership skills hence the commitment to the vision and objectives of the organisation. Ojo et al., (2007) also argue that the e-government implementation cannot be achieved without the commitment from the senior leadership. The senior leadership need to inspire and show commitment to the other staff members so as avoid the loss of expertise and human resource. Most of the developing countries are losing skilled staff from the public sector to the private sector due to financial sustainability. This is why the senior leadership of an organisation is a critical factor that can influence the adoption and implementation of e-government (Altameem, 2007).

3.5.3.5. Financial Resources Factor

Trusler (2003) argue that in public institutions, the ICT-related expansion always receives lesser priority in terms of financial budgeting due to other pressing priorities of the government. This makes the financial resource the most critical and significant factor for the implementation of e-government. Feng (2003) also stated that a major obstacle to e-government is the lack of financing of new technology, while Carvin *et al*. (2004) emphasise that because of the high cost of implementation of new technologies, many countries are in dilemma of funding e-

government programs, even when a government entity has a great plan for effective and accessible e-government.

3.5.4. The Environmental Context

According to Heeks and Bailur (2007), the adoption and implementation of e-government rely not only on technological and organisational contexts but also on the environmental factors. These environmental factors are mostly linked to economic, political, cultural and regulatory traits (Bolgherini, 2007; Bakry, 2004; Hameed, 2007; Ahn, 2011). These environmental factors are shown in figure 13 and described in the sections which follow.

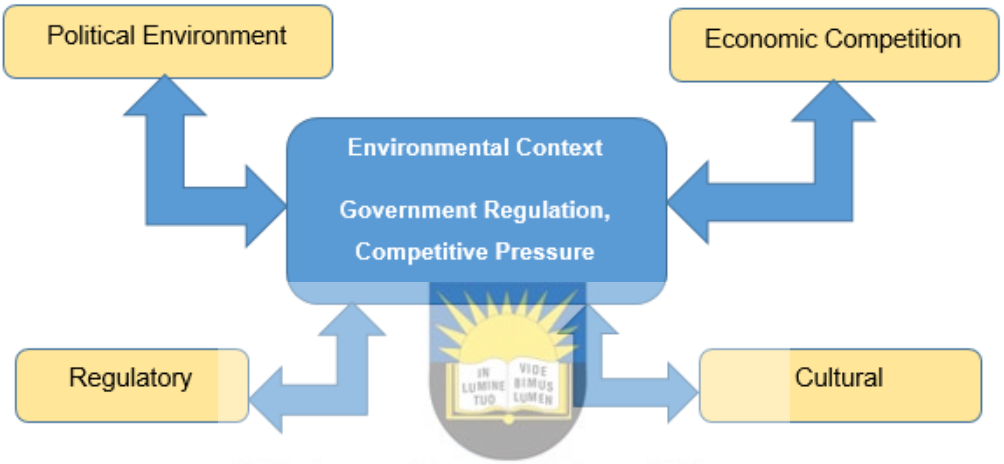


Figure 13: Environmental context with its factors

3.5.4.1. Political Environment Factor

The e-government process involves various political principles that include public responsibility, public involvement, autonomous openness, honesty, trust and service excellence (Nour et al., 2008; Bolgherini, 2007; Bwalya and Healy, 2010; Ahn, 2011; Al Nagi and Hamdan, 2009). Heeks (2003) also argues that one of the causes for the failure of e-government implementation in developing countries is the reliance only on the values and logic of the environment, while the developing countries are focusing on the political will of the country.

Besides, the political uncertainty, corruption and insecurity in a country tend to force the citizens to lose confidence in their government which affects the implementation of e-government (Ndou, 2004). So, the adoption and implementation of e-government need robust political leadership that will have the power to enforce transformations around the public service.

3.5.4.2. Economic Competition Factor

According to Iacovou et al. (1995) and Zhu at al. (2003) e-government adoption and integration are driven by the competitive environment. This is based on the competitive edge for organisations and forces organisations to enhance service provisioning, information openness and competencies (Zhu and Kraemer 2005), however, in the public sector for the developing countries, this competition factor is influenced by other priorities of the government such as education and health.

Recent studies have also shown that ICT and new technology adoption has played a critical part in the economic development and stimulates sustainable delivery of service hence reducing poverty (Hameed, 2007; Braund et al., 2007; Mamaghani, 2010). However, this new technology adoption should be accompanied by the implementation of essential aspects of organisational context jointly with robust political control and influence. This will ensure a competitive advantage and contribute to the world economy (Mamaghani, 2010).

3.5.4.3. Cultural Factor

According to Sathe (1983), culture is described as a collection of mutual principles and morals shared by members of a society and it has a significant impact on the implementation of e-government. This is critical to the adoption of e-government due to new technologies being presented within the initiative (Feng, 2003). West (2001) also argues that cultural dissimilarities and discrete behaviour configurations influence the approval and use of new technology. However, the cultural issue is not material, and it must be carefully planned so that technical change is implemented successfully (Weisinger and Trauth, 2003).

3.5.4.4. Regulatory Factor

Heeks (2001) explains that the government regulations are a prerequisite for the e-government initiative, this includes the initiation stage up to the service delivery phase. Watts (2001) also argues that legal threats that are associated with technology innovations might expose government institutions to severe obligations. The e-government initiative involves various online systems and therefore regulations and legislative laws are required to cater for these variations. These systems include data governance, cybersecurity measures, digital signatures and the Protection of Personal Information (POPI) act. Thus, regulatory laws have to be developed and reviewed occasionally to avoid e-government failures.

The detailed analysis of all the theoretical factors identified through the TOE three contexts of Technology, Organisation and Environment lead to the proposed conceptual framework as explained in the next section.

3.6. A PROPOSED CONCEPTUAL FRAMEWORK FOR E-GOVERNMENT IMPLEMENTATION IN SOUTH AFRICA

The literature (Chapter 2) and theoretical analysis (Chapter 3) presented signifies the Technology-Organisation-Environment (TOE) contribution to the proposed conceptual framework through the Technology, Organisation, Environment contexts as shown in figure 14. The proposed framework consists of the following:

- **TOE contexts** – Technology, Organisation and Environment.
- Implementation factors – **Technology:** ICT Strategy and ICT Infrastructure. **Organisation:** Organisational Culture, Senior Leadership, Collaboration, Financial Resources and Resistance to Change. **Environment:** Political, Economic, Regulatory and Cultural.

This conceptual framework offers a framework for guiding the empirical study to address the main research question:

- *What are the necessary elements of a framework for the implementation of e-government as a service delivery mechanism in South Africa?*

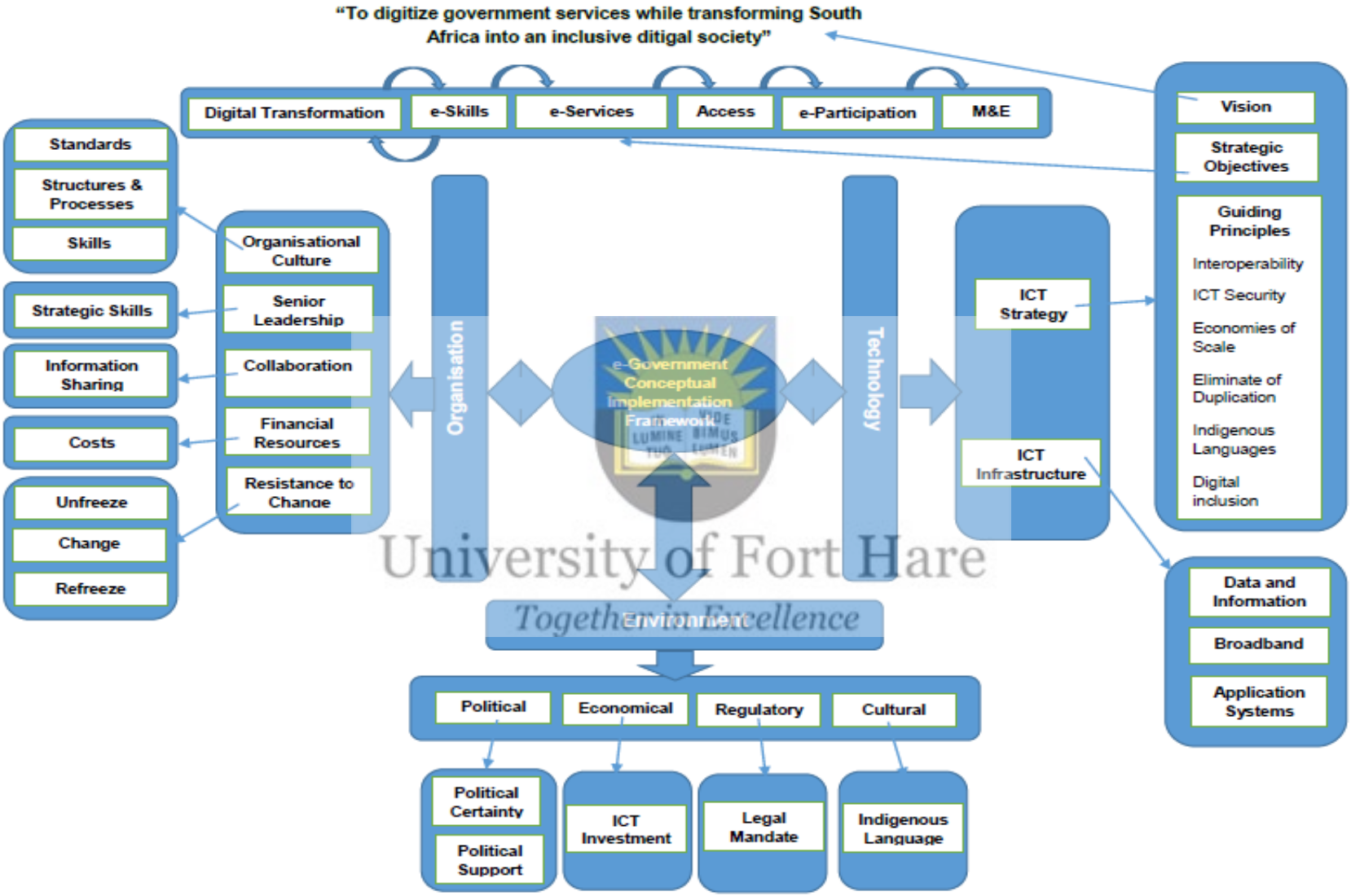


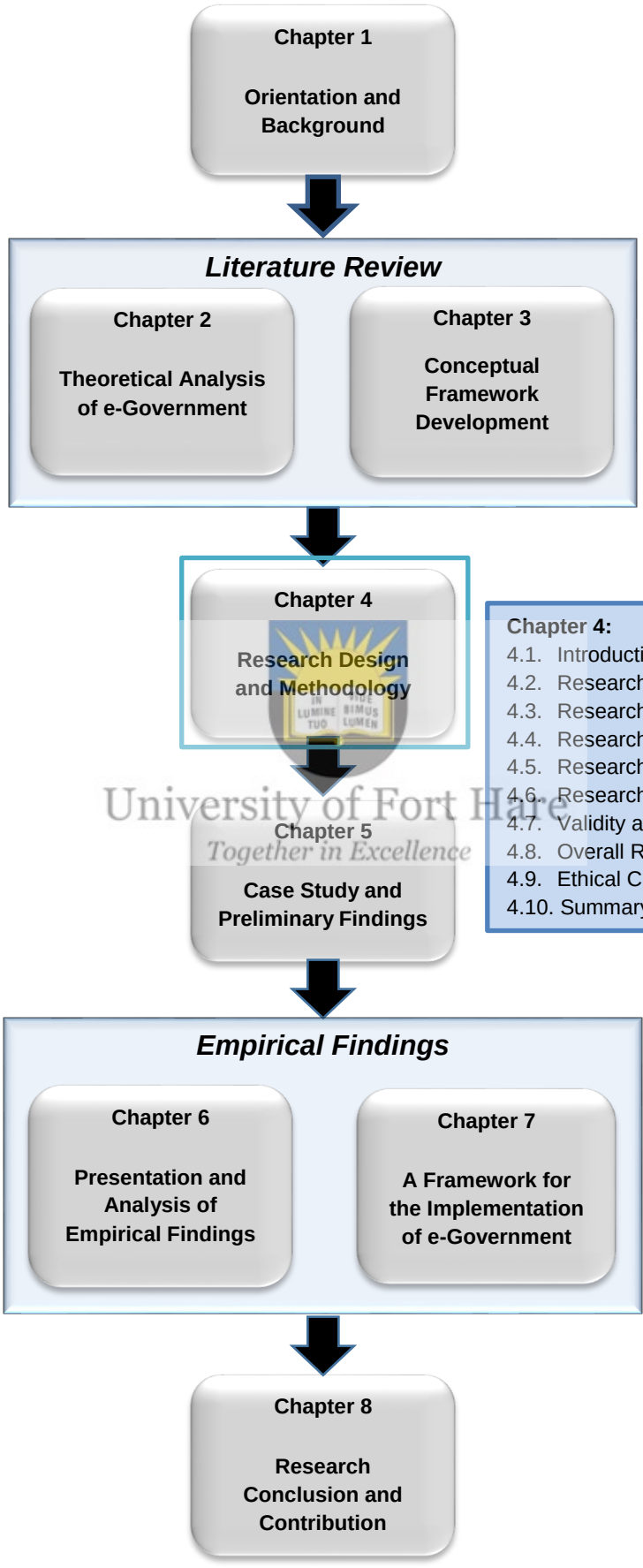
Figure 14: The proposed conceptual framework for e-government implementation

3.7. SUMMARY

The chapter presented the difference between a theoretical and conceptual framework and how one influences the other. The chapter also focused on the change management process as perceived from the public sector and the nature of change as seen through the South African public service. The chapter also discussed the three contextual foundations of the TOE framework and analysed in detail the underlying factors for each context. The identified underlying factors are critical in the development of the conceptual framework for the adoption and implementation process of e-government since the aim of the research study is to develop an implementation framework for e-government as a service delivery mechanism in South Africa.

The objective of developing the conceptual framework has been achieved and is based on the influence of the TOE underlying factors in understanding the overall challenges and successes of e-government implementation in South Africa. These factors include ICT Strategy and ICT infrastructure under the Technology context; Organisational Culture, Senior Leadership, Collaboration, Financial Resources and Resistance to Change based on the Organisational context; and lastly, Political, Economic, Regulatory and Cultural under the environmental context. The conceptual framework will be tested within the problem area of the Thusong Service Centres to get an in-depth insight into the implications of e-government in the service delivery process thereby finding a solution to the research problem. The research methodology process for this study is then presented in the next chapter.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY



Chapter 4:

4.1. Introduction
4.2. Research Philosophy and Paradigm
4.3. Research Design
4.4. Research Approach
4.5. Research Strategy
4.6. Research Methods
4.7. Validity and Reliability of Data
4.8. Overall Research Process
4.9. Ethical Clearance Approval
4.10. Summary

4.1. INTRODUCTION

This chapter focuses on the research methodology principles and the correct approach towards addressing the research problem and how it should be examined. Some various approaches and techniques can be utilised in research methodology. These techniques are guided by the research aim and research problem. In this study, the problem entails identifying challenges that affect the implementation of e-government, and the aim is to develop a detailed framework for the utilisation of e-government as a service delivery mechanism in South Africa.

The objective of this chapter is to identify the research paradigm, strategies and methods in solving the research problem. The two main research approaches of Qualitative and Quantitative are fully explained focusing on features, strong point and flaws. The study also justified the use of a qualitative exploratory method as the preferred approach. The selection is based on the inductiveness of the research and that of selecting a single-case study as represented by the Thusong Service Centres. This allowed for elasticity due to intricacies in the implementation of e-government.

A data collection process that includes sampling, face-to-face semi-structured interviews and document analysis is explained in detail including triangulation, validity and reliability of data. An evaluation process by expert panel members is also presented focusing on the interview process and the proposed implementation framework. This chapter empowered the researcher with the necessary tools to collect, analyse and validate empirical data in solving the research problem.

The sections are structured as follows: Section 4.2 focuses on the research philosophy and paradigm, followed by section 4.3 dealing with research design. Section 4.4 discusses the research approach, followed by section 4.5 (research strategy) and section 4.6 (research methods). Section 4.7 deals with validity and reliability of data followed by the overall research process as section 4.8 and ethical clearance approval, section 4.9. The final section is a summary of the chapter.

4.2. RESEARCH PHILOSOPHY AND PARADIGM

A ‘paradigm’, as a concept developed by Kuhn (1970), means an essential positioning in terms of research and theory (Neuman, 2006). It incorporates two proportions (1) philosophical, that is, basic principles and hypothesis about the universe; and (2) technical, the structure and procedures implemented when performing research (McGregor and Murnane, 2010). Oates (2006) claim that researchers in Information Technology (IT) disciplines regularly focused on

developing IT objects rather than reflect on the underlying research philosophy. This creates a challenge due to the research philosophy being the one that informs the research methodology to be pursued. So, the selected methodology by a researcher is determined by the paradigm within which the study will direct.

Selecting a correct paradigm requires critical considerations as narrated by Maxwell (2005) particularly (1) it is vital to decide on a suitable research paradigm that will direct and explain research design choices, (2) using a reputable paradigm permits the researcher to select a proper research approach and (3) based on the researcher's expectations and methodological preferences evaluate which paradigm is suitable. McGregor and Murnane (2010) claim that there are three main philosophical paradigms, namely, positivism, interpretivism and realism which agrees with Oates (2006) in identifying positivism, interpretivism and critical research. However, Collis and Hussey (2009) identified only positivism and interpretivism paradigms. Therefore, the following sub-sections will outline, compare and justify the selection of the paradigm between positivist, interpretivist and critical realism research paradigms.

4.2.1. Positivism Paradigm

Meyers (1997) and Irani et. al. (1999) claim that positivist studies escalate their analytical or predictive interpretation of phenomena through examining models. Reality is objective and can be defined by quantifiable measurements, which is the positivist's viewpoint. Iran et. al. (1999) further declares that the knowledge might be acquired or shared when researchers are autonomous to appliances and gadgets. In the positivist paradigm, there are three critical steps, (1) data is quantified, (2) hypothesis testing, and (3) objective actions are executed (Muijs, 2010).

The objectivity of the positivist paradigm suggests that research findings by one researcher can be repetitive through to the next researcher who conducts the same study due to the researcher having no influence. It is also quantitative and deductive as it makes use of overall results to feature properties to unambiguous occurrences (Olivier, 2004). Various philosophers of science are critical of the positivism paradigm because it plays a critical part in hypothesis formulation but enforce limitations on the outcome due to a very structured research design which may overlook other results (Popper, 1963; Mintzberg, 1979; Hirschheim, 1985; Klein and Lyytinen, 1985; Collis and Hussey, 2009). This is in contrast with the interpretivist paradigm which is subjective and relies on the researcher's social context as outlined in the next sub-section.

4.2.2. Interpretivism Paradigm

Interpretivism is commonly used in social science research and focuses on the exploration of the underlying meanings entrenched in human behaviour. According to Irani et. al. (1999), researchers with the viewpoint aligned to interpretivism emphasise the information acquired through observation and personal phenomena with subjects in empirical research. Interpretive studies seek to interpret and comprehend phenomena by allocating people and collecting data around their experience and knowledge (Walsham, 1993; 1995).

Interpretivism is also useful in trying to understand the challenges and problems of a social nature with the application of contextualisation, which defines society as a unique entity that develops over time. So, every society requires its study to be fully understood (Mora et al., 2012). The interpretivism paradigm tries to find information through people's understanding of reality. However, the main critic of this paradigm is based on its reliability, validity and generalisation when it comes to social research (Marcen et. al, 2013). Other critics include the biases of a researcher's findings through the interference of the researcher in the day-to-day interaction of the researcher's participants (Kura, 2012). Nevertheless, it is a paradigm that is regularly endorsed for research studies that involve culture, language and human contact due to its response and criticism to positivism (Collis and Hussey, 2009). Moreover, the interpretivism is not about justifying or not justifying the hypothesis as is the case with the positivist research, but somewhat to find, discover and clarify how the factors in a social setting are connected and inter-reliant (Oates, 2006). However, critical researchers disapprove the interpretivism research for its inadequacy to measure the trends of authority and control that set views of reality (Oates, 2006).

Researchers also emphasise that interpretivism paradigm could be utilised from the viewpoint of partakers causally linked with a specific phenomenon to know the study of the phenomena. Thus, the interpretive paradigm asserts that social reality is not objective but very subjective and this caused by our perceptions. Hence, it rotates around individual perceptions (Lee, 1991; Irani et al., 1999).

The interpretivism paradigm was used for this study for the following reasons:

1) As mentioned above in section 4.2.1, a positivism paradigm is most suitable when testing hypotheses with associated variables and this study has none of these, therefore a positivist method is not applicable.

2) It is associated with gaining in-depth knowledge into the subject and the most commonly utilised research methods are the case study and interview process (Lederman and Abell, 2014).

3) This research is focusing on the public administration and it confronts composite organisational challenges that include structure, culture and technology.

4) An interpretivist approach allows the researcher to study e-government phenomena empirically and fully understand the problems facing the organisations studied. Through interviews, the researcher could explore the challenges related to e-government implementation. These could then be confirmed through expert review.

5) The interpretivist paradigm is, therefore, the appropriate paradigm when trying to appreciate and understand human behaviour and phenomena (Al-Shehry, 2008; Alfarraj, 2013). It is also normally reliant on qualitative data. In this study, data was collected through in-depth, unstructured interviews. This is conducted with stakeholders of the Thusong Service Centres across the Eastern Cape Province.

4.2.3. Critical Realism Paradigm

The critical paradigm accepts the opinion of historical practicality, assuming that reality is designed by political, social, ethnic and gender standards (Brincat, 2012). The critical paradigm view is aiming to encourage equality in humanity by thought-provoking about the underpinnings of social, political and culturally oriented behaviour (Scotland, 2012). This paradigm was influenced by the industrial revolutions well-versed by the belief of class conflict.

Critical realism paradigm has similar concepts of interpretivism, but it is philosophically utilised in acquiring information in the form of obstructions, struggles and inconsistencies in modern society. Academics also argue that critical realism paradigm is concerned with trying to analyse, assess and change the social realism and adjust the status quo, whilst the positivist and interpretive focus in clarifying or predicting the status quo (Orlikowski and Baroudi 1991; Myers 1997; Klein and Myers; 1999; Littlejohn, 2000; Myers and Avison 2002; Oates 2006).

The positivism and critical realism paradigms are both inappropriate for this study based the fact that the research objective is for the development of a framework for the implementation of e-government as a service delivery mechanism in a developing country like South Africa. This includes developing a conceptual framework which should influence government policymakers and decision-makers in addressing e-government implementation challenges. Interpretivism has been selected as the most appropriate philosophical paradigm for this research study due to its qualitative and subjective philosophy (Collis & Hussey, 2009).

4.3. RESEARCH DESIGN

According to Creswell (2009), a research design is a strategy or plan, structured in such a way that the research questions are being addressed systematically. It emanates from the research problem through to achieving the research objectives. Creswell (2009) further elaborates that it involves (1) a plan that outlines the approach to conducting the research, (2) the structure of the research work, and (3) a strategy of how the research will be conducted.

The research design includes approaches and events for obtaining the required knowledge in conducting the research (Strauss and Corbin, 1998; Creswell, 2009). Studies by Creswell (2009, 2003), de Villiers (2005) and Henning et. al. (2004) also agree that research study is not done in a vacuum but through a pre-planned process linking it to a philosophy model and assumptions of a research problem.

According to Gravetter and Forzano (2012), the research design is guided by the purpose of the research and this can be exploratory, descriptive or explanatory. This includes various features of research philosophy, strategy, methods and approach. Shields and Rangarjan (2013) further explain that exploratory research is done for an issue that is not studied, and its objectives are to create significances, so to advance the ultimate research design. However, if the background literature discloses some significance to the research problem and the idea is established then the descriptive research is appropriate and addresses questions like how, what, when and where. It defines the phenomena.

Later, a significant role is played by explanatory research in explaining the missing “why” in the descriptive research. Lake (2009) summarizes the definition of research design as a framework that encompasses various important mechanisms when trying to explain a research problem. Thus, exploratory research is not utilised to conclusively decide the evidence but assist in understanding the issue more proficiently. That is, as new data is produced the researcher should be versatile enough to familiarise himself/herself about the new perceptions that are discovered through the studies (ALQahtani, 2016). Therefore, an exploratory research aims to identify themes and relationships in the research data, so that a research design can be developed to address the research question.

With this in mind, electronic government (e-government) has been widely researched especially in developed countries but there are very few studies around e-government implementation and adoption in the developing countries at an organisational level. This includes South Africa. Hence an exploratory research approach is used for this particular study. ALQahtani (2016) also explain that to answer research questions based on the challenges and challenges impacting the implementation of e-government in specifically

addressing technological, organisation and environmental contexts as depicted by the Technology Organisation Environment (TOE) framework, a social perspective also needs to be considered for the benefit of the citizen's viewpoint. The research design is then presented as in Figure 15 and is aligned with the research questions. RQ1 is aligned to step 2 and step 6; RQ2 aligned to step 3, 4 and 5; RQ3 aligned to Step 2 to step 6.

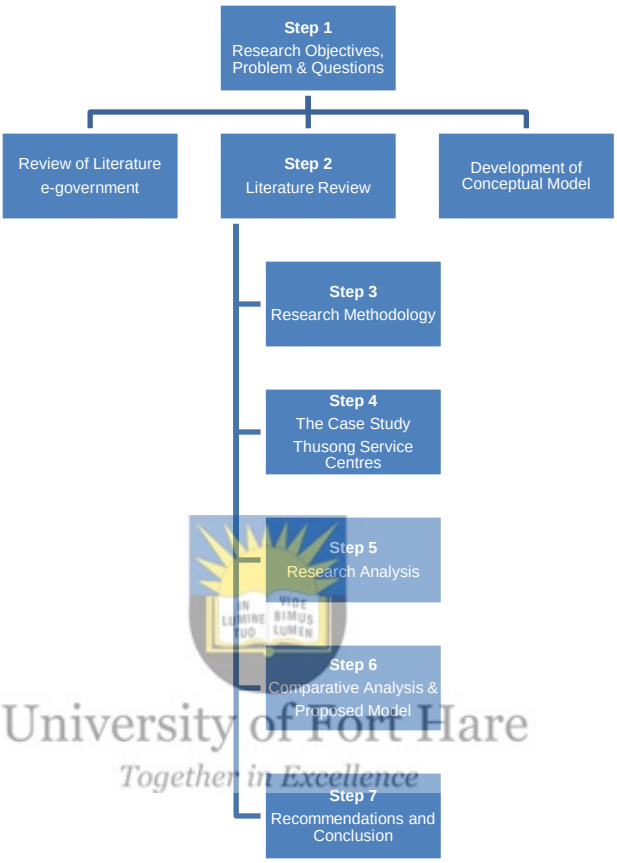


Figure 15: Research Design

4.4. RESEARCH APPROACH

The research approach is a procedural plan that entails the detailed plan of data collection, analysis and interpretation. It is, therefore, grounded on the nature of the research problem being investigated. Yin (2013) also define the research approach as a process that includes the collection of data and consequent analysis of that data in addressing the particular problem. There are three types of research approaches, quantitative, qualitative and mixed methods (Tashakkori and Teddlie, 2003).

According to Ghauri and Gronhaug (2010), the reasons for using qualitative or quantitative approaches are based on the objective of the study, the previous background and knowledge of the researcher and which field of study is the research based on. The main features and

comparisons of qualitative, quantitative and mixed methods approaches are discussed in the following sub-sections.

4.4.1. Mixed Methods

The combination of approaches in social science research has been labelled using a variety of names that include integrative, multi-methods and mixed-method research (Harrison and Reilly, 2011). A mixed-method approach incorporates different research approaches in a particular study by addressing shortfalls that are experienced by individual approaches (Leech and Onwuegbuzie, 2009). Scholars have utilised both the qualitative and quantitative approaches in the research of the same occurrence, by combining data from both approaches to create a new concept, this has led to a mixed-method approach (Cresswell and Plano-Clark, 2007).

4.4.2. Quantitative Approach

Altameem (2007) defines the quantitative approach according to the observed perceptions on a social subject to explain the phenomena. Nau (1995) also emphasises that the quantitative approach focuses on queries of "how much" or "how often". The quantitative approach is used for examining objective models by testing the associations between variables. The variables are then measured and analysed using statistical processes (Creswell, 2013). Creswell (2003; 2007; 2013) further concludes that the quantitative approach is appropriate for finding challenges that impact on the consequences of a social issue.

A quantitative approach is known to be deductive and that the quantitative researchers see the universe as independent of any observations (Rovai et al., 2014). Scholars using quantitative approaches also deal with splitting the reality into controllable fragments of study that can be easily understood. These fragments can be used to build hypotheses that can be verified and analysed based on the associations among variables.

They contend that by subdividing this reality into smaller, manageable pieces, for the study, that this reality can be understood. It is within these smaller subdivisions that observations can be made and that hypotheses can be tested and reproduced concerning the relationships among variables. Therefore, the quantitative approach contends towards the assembly and analysis of data, utilising statistic-based methods (Aliaga & Gunderson, 2000; cited in Muijs, 2011).

4.4.3. Qualitative Approach

A qualitative approach is typically labelled as inductive, with the fundamental expectations that reality is a social idea and that variables are not easily measurable, composite and that dominance of the study and its collected data rely on the individual's viewpoint (Rovai et al., 2014). The qualitative approach mostly deals with data that is descriptive and composed utilising qualitative means. This approach can improve the knowledge around a research problem through qualitative tools and provide a scientific solution (Chen and Chou, 2015). Oseni, Dingley and Hart (2015) claim that this approach is also useful in building theoretical models and policies in a social context. Therefore, the qualitative approach is reflected as assisting for understanding deeper challenges emanating within the Information Systems field, hence they are best for investigating studies involving e-government.

Holliday (2007), and confirmed by Creswell (2014), explain that a qualitative approach puts importance upon discovering and making sense about individual or group meanings assigned to a social challenge. This approach as described by Denzin and Lincoln (2005) relies on studying them in their setting and gaining individual knowledge. The data collection of the qualitative approach is characterised by the contributor's environment with data analysis starting from specific to overall themes and the researcher deducing from the data (Creswell, 2013).

There are some weaknesses involved with the qualitative approach and this include the (1) complexity and abundance of data that can make it difficult to analyse and interpret, (2) human bias from both the participants and the researcher if the subject matter is already known and (3) real-life situations that are frequently impacting on the reliability and validity of the study (Cornford and Smithson, 2006; Collis and Roger Hussey, 2013). Bryman (2004) summarises the essential differences between the qualitative and quantitative approaches as shown in Table 9.

Table 9: Differences between qualitative and quantitative approaches (Source: Bryman, 2004)

Orientation	Qualitative	Quantitative
Research Theory	Inductive	Deductive
Epistemological	Interpretivism	Positivism
Ontological	Constructionism	Objectivism

This research study focuses on the Technology Organisation Environment (TOE) framework factors that impact on the implementation of e-government in the Thusong Service Centres as the service centres of government. So, it is significant to appreciate the various environments of reality in the social world (Oseni, Dingley and Hart, 2015). The qualitative research method will record the TOE factors in a single model that will permit researchers to study in-depth intricacies and processes of phenomena such as e-government (Al-Busaidy, 2011). This will permit some elasticity for the researcher during interviews to study e-government implementation in an ordinary environment to generate theories from actual settings. Finally, the study requires a rich empirical data from the in-depth understanding of e-government that indicates the use of qualitative research as a viable approach.

This study, therefore, endorsed a qualitative approach that is realistic to the public sector as represented by the Thusong Service Centres. The collection of data is based on five Thusong Service Centres in the Eastern Cape, SITA as an ICT agency of government, CIOs that partake in the centres and citizens utilising these centres. The selected respondents were examined for their perceptions and viewpoints around e-government, thereby categorising the challenges that impact the e-government implementation. This approach focuses on the in-depth knowledge and discrete standpoints of the phenomena which are supported by the qualitative and not the quantitative approach (Creswell, 2013).

4.5. RESEARCH STRATEGY

According to Collins and Hussey (2003), a research strategy signifies the plans and actions of a researcher when solving a specific research problem. This involves questions, objectives, methods and whether the research is inductive or deductive. Yin (1994) also indicate that inductive and deductive research signifies to the main purpose of the study. Collis and Hussey (2003) further explain that deductive research moves from an overall position of an idea to a more explicit objective. Deductive research starts with a hypothesis and collects information in proving the hypothesis. Whereas the inductive starts with precise knowledge of an idea for responding to a precise query or challenge that is then associated with the underlying theory. Then such investigation may lead to the development of a conceptual model (Cavaye, 1996; Trochim, 2001).

The inductive research is normally utilised to collect data and built a theory by analysing that data (Saunders et. al., 2003). So, inductive research begins with interpretations (case study) and built a theory using the empirical data. The Open University (2015) and Yin (1994) identifies five core types of research strategy (1) case study, (2) experimental, (3) survey, (4) histories, and (5) analysis of archival information. Yin (1994) claim that the advantages and disadvantages of these strategies depend on three situations as shown by Table 10.

- Research question type
- Control of behavioural situation by the researcher
- Focus on existing events

Table 10: Different types of research strategies (Source: Yin, 1994)

Research Strategy	Question Type	Control of Behavioural Situation	Focus on exiting events
Case Study	How, why, and what	No	Yes
Experimental	How and why	Yes	Yes
Survey	Who, what, where, how much, and how many	No	Yes
Archival Analysis	Who, what, where, how much, and how many	No	Yes / No
History	How and why	No	No

Therefore, this study utilised an inductive research approach through a case study to empirically collect data from the physical world based on the proposed conceptual framework developed in the previous chapter to reconfigure the framework. There are also other research strategies as identified by Creswell (2009) which include the biography, grounded theory, phenomenology, ethnography and case study.

According to Benbasat et. al. (1987), the research strategy is based on the research topic and research objectives. The collection of data and individual behaviours from the respondents makes the case study conducive as a research strategy for this study to understand and judgmentally evaluate the context of the problem. Moreover, the case study methods are normally utilised to assist researchers to create new or improved models (Berg, 2004).

Yin (1994) also recommends that case studies are a complete evaluation of a specific occurrence in their normal environment where a collection of data is conducted utilising interviews, questionnaires and observations. Also, case studies do not utilise statistical analysis because the results are collected straight from the respondents' experience (Benbasat et al., 1987; Berg, 2004). Benbasat et. al. (1987) recognised the underlying facts as to why case studies are applied for Information Systems (IS) research:

1) A theory can be generated by learning the ordinary settings of the phenomena.
2) By responding to “why” and “how”, the researcher can produce a piece of knowledge about the status and complication of a problem.
3) Case studies are conducive for studies in areas where little research has been performed, in this case, the Thusong Service Centres.

Yin (1994) defines three types of case studies, exploratory, explanatory and descriptive. An exploratory case study is conveyed to propose or plan another model or system with which to study another phenomenon (Yin, 1994; Saunders, 2009). This is further clarified by Saunders et al. (2003) that exploratory case study incorporates consultations with specialists of the topic or all the more by and large with individuals learned about the phenomena. Descriptive case studies centred on occasions or circumstances that have occurred previously and need to accomplish more with explicit cases (Hamel et. al., 1993).

The usage of a single or multiple case study strategy is determined mainly by the question being addressed. Yin (2006) explains that the use of a single case study is justified (1) when the suggestions are believed to be positive, (2) when investigating the aptitude or capabilities of an individual or institution in a unique environment, (3) when the case being tested is representing other cases, (4) when respondents perceive phenomena that were not reachable before or (5) when the study is focusing on two dissimilar areas in the same case (Bayman and Bell, 2007; Yin, 2006).

Many researchers including Yin (1994) and Byman and Bell (2007) explain that the multiple case study is a mutual way of linking dissimilar views of two or more case studies. Also, a multiple case study can follow a single case as suggested by Benbasat (1987) and Yin (2006). Multiple case studies are very instrumental for researchers when they want to relate or check dissimilarities with the findings on each case. Yin (2006) identifies this as a cross-case analysis.

An exploratory single case study is ideal for this research because the researcher needs to construct a framework and acquire bits of learning into the challenges of e-government implementation in the Thusong Service Centres as a case study. A single case study strategy has been identified which leads to the required research methods for the research.

4.6. RESEARCH METHODS

The research methods empower the researcher with the prospect of addressing the research problem with a sequence of interviews, questionnaires, surveys, observations or document review. Yin (2003) categorises data as primary and secondary. Primary data is put together through questionnaires, interviews, observations or surveys. The secondary data is

assembled through analysis and review of literature that include articles, books, journals and accessing the Internet, which is faster than the primary data due to readily available of information (Yin, 2003; Zikmund, 2000; Saunders, 2003). This research is based on a single-case study of the Thusong Service Centres, so the research method that is used is based on interviews, observations and document analysis.

4.6.1. Data Collection

According to Yin (2009), the techniques of data collection are classified as a foundation of empirical evidence and will be central to the outcomes of the research. It is critical for the qualitative research in that it includes a systematic approach of assembling bits and pieces of evidence that are important to the study at hand. This will allow the researcher to address the research questions and assess the conclusions. It will also allow the reliability and trustworthiness of the case study since the incorrect data gathering can lead to a negative outcome (Parikh, 2002: Bachman and Schutt, 2008).

The data collection process for the qualitative research approach generally includes one-on-one communication with the respondents or individuals in a clustered environment. This process of interaction is much more involved hence a small sample size is always preferred. The major benefit of this direct interaction is that the data collected is more meaningful and gives a deeper understanding of the phenomenon (Flick, 2002; McClure, 2002; Yin, 2003, Johnson and Turner 2003)

This source of evidence is based on interviews, observations and document review (Yin and Benbasat, 2009). The objective of using various sources is based on the collection of multiple data set in addressing the identified phenomena (Benbasat et al., 1987).

4.6.1.1. Sampling

Sampling is an important part of any research study. Sampling is the subset of the population that researchers are interested in studying. The sample group is normally much smaller than the total number of people in the population, but it is usually intended to be representative of the original population group (Maree and Pietersen, 2007). If the investigation aims to produce an in-depth description and not generalise findings, non-probability sampling is used. It is used when it is difficult to sample an entire population (Merriam, 2009; Maree and Petersen, 2009).

There are various forms of non-probability sampling that include convenience sampling, quota sampling, opportunistic sampling and purposive sampling (Onwuegbuzie and Collins, 2007) In this research study, a non-probability purposive sampling method will be used. The main goal of this purposive sampling for this study is to focus on particular characteristics of a

population that is of interest, which will best enable the research to answer the identified research questions. Data will be collected utilising semi-structured interviews focusing on the senior ICT leadership of government responsible for the implementation of e-government in South Africa.

The targeted group for this research is based on four sets of respondents (1) the State Information Technology Agency (SITA) project managers who are the agency of government responsible for the provision of ICT services in government including e-government project, (2) the CIOs from various government departments at national, provincial and local that are partaking in the implementation of e-government in the Thusong Service Centres, (3) the Thusong Service Centre Managers liable for the daily running of the centre, (4) the community end-users who are utilising the centres and (5) expert review panel from the senior leadership of the government.

Candidates that are targeted for participation in this research are shown in Table 12.

Table 11: Study participants

Category	**No of Respondents**
Thusong Service Centre (TSC) Managers	5
Chief Information Officers from various Government Departments (National, Provincial and Local)	7
State Information Technology Agency (SITA) Project Managers/Consultants	2
Citizens	3
Review experts	5
TOTAL	***22***

The profiling of the Thusong Service Centres and selected participants information is discussed in detail in Chapter 5 (section 5.5. and 5.6) of the case study.

4.6.1.2 Interviews

Oates (2006) defines an interview as a pre-planned dialogue to collect information from the respondents who have agreed on rules that are not part of an ordinary discussion. These interviews are done on a face-to-face approach. Researchers have identified three types of interviews, namely: structured, semi-structured and unstructured.

Unstructured interviews are based on unrestricted or open-ended questions, which permit the researcher to witness the position of the respondent, whereas structured interview is when the researcher defines a collection of questions from a pre-assembled inquiry form and investigates into responses and familiarise him/herself to dissimilar environments with different respondents. The semi-structured interviews are intensive pre-determined inquiries for all interviewees in a related pattern but with an allowance for open-ended responses (Welman et. al., 2005; Saunders et. al., 2003; Stewart and Cash, 2006).

This study utilised the semi-structured approach of interviews due to flexibility and capturing of information from the respondents and their experiences regarding the subject at hand. Rabionet (2011) identified six stages or processes for conducting a semi-structured interview, (1) selection of the type of interview, (2) institute ethical procedures, (3) development of interview protocol, (4) performing the interview, (5) development of a reporting procedure, and (6) reporting the results. A research interview process is a step-by-step plan that is used to conduct an interview. This has been categorised in two parts, (1) interview guide and (2) interview questions. The interview guide is used to collect the primary data from the respondents through semi-structured interviews and questions which are explained in detail to the respondents by the researcher. Answers are recorded and transcribed including verification for accuracy and validity. The interview guide and questions are included as Appendix B.

The interviewer conducted each interview with a prearranged identical set of questions which are then followed by follow-up questions for more clarity. This allowed the respondents to freely expand on any important information for the complete understanding of the subject matter. Moreover, the interviewer must explain in confusing detail questions.

A pilot interview process was conducted with members of the Provincial Government Information Technology Officers (PGITO) Council which are at a senior level of government. The pilot included testing the interview questions for relevance and the time it takes for each interview. The results of the pilot entail the following:

1) The Apple iPhone app recorder was preferred compared to a tape recorder.
2) The questions were clear and understandable.
3) Each interview lasted for about an hour.

4) Respondents gave information about their experiences with e-government.
5) English was the preferred language.

Based on the feedback of the pilot interviews, the research questions were reviewed and grouped into four categories, questions for (1) project managers from SITA, (2) Chief Information Officers from various Government Departments (National, Provincial and Local) partaking in the Thusong Service Centres (3), Thusong Service Centre managers (4) Citizens utilising these centres and (5) Expert Review Panel

All questions were e-mailed to the respondents before the interview so that the respondents can familiarise themselves with the questions. Some of the respondents are currently working with the researcher, so to avoid bias data collection through document analysis was also conducted, and expert reviews were conducted to verify the findings and contribution.

4.6.1.3. Documents and Literature Review

The documents reviewed include strategies, policies, reports, parliamentary briefs and reference material including journals and periodicals from the Internet. The advantage of analysing these documents is that they are easily accessible and can be reviewed anytime. The documents were classified as shown in Table 11.

Table 12: Classification of document review

Type of Document	Contents
Policies	National Development Plan E-Government Policy National Broadband Policy Cloud-First Digital Policy State Information Technology Agency Act Policy on Free and Open Source Software ICT Policy White Paper
Frameworks	Minimum Information Security Standard Corporate Governance of ICT Policy Framework ICT Charter
Websites	http://www.sita.co.za http://www.sars.co.za http://www.dot.gov.za http://www.dha.gov.za http://www.saasa.org.za

	http://www.dtps.gov.za http://www.ecdhs.gov.za http://www.echealth.gov.za http://www.bcm.gov.za http://www.gcis.gov.za
Journals	Articles from various journals
Conferences and Workshops	GovTECH Digital Economic Summit South Africa

The secondary data in the form of documents was significant in case of any shortcomings that may occur in the interviews and to cross-validate the data collected during the interviews.

4.6.1.4. Expert Review

Expert review is considered as an important evaluation method for a research study. It is used in both formative ways (based on the improvement of the study) and summative ways (concerned with data in answering research questions) (Simon, 2011). The participants of the five experts for a review of the study included three Deputy Director-Generals and two Chief Directors from National and Provincial government departments of the South African public sector administration who are involved in e-government initiatives.

The expert review panel was supplied with the completed e-government implementation framework that was developed through the study including the set of interview questions that were used in answering the research question. They were expected to complete an interview validation form and framework evaluation form as shown in table 12 and 13 below.

Table 13: Interview validation form for expert review panel (Simon, 2011)

		Score **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some	

Criteria	Operational Definitions	modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				**Questions NOT meeting standard (List page <u>and</u> question number) and need to be revised.** ***Please use the comments and suggestions section to recommend revisions.***
		1	2	3	4	
Clarity	• The questions are direct and specific. • Only one question is asked at a time. • The participants can understand what is being asked. • There are no *double-barreled* questions (two questions in one).					
Wordiness	• Questions are concise. • There are no unnecessary words					
Negative Wording	• Questions are asked using the affirmative (e.g., Instead of asking, "Which methods are not used?" the researcher asks, "Which methods *are* used?")					
Overlapping Responses	• No response covers more than one choice. • All possibilities are considered.					

	• There are no ambiguous questions.					
Balance	• The questions are unbiased and do not lead the participants to a response. The questions are asked using a neutral tone.					
Appropriateness of Responses Listed	• The choices listed allow participants to respond appropriately. • The responses apply to all situations or offer a way for those to respond with unique situations.					
Use of Technical Language	• The use of technical language is minimal and appropriate. • All acronyms are defined.					
Application to Praxis	• The questions asked relate to the daily practices or expertise of the potential participants.					
Relationship to Problem	• The questions are sufficient to resolve the problem in the study • The questions are sufficient to answer the research questions. • The questions are sufficient to obtain the purpose of the study.					

A content analysis matrix based on the expert panel review will form part of the data analysis process as presented in Chapter 7.

Table 14: Framework evaluation form for the expert panel

TOE Context	Operational Definitions	Score **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				**Context / Factor(s) missing OR not meeting standard** ***Please use this section for comments and - suggestions.***
		1	2	3	4	
Technology	Technological factors affecting the effective implementation of e-government in the Thusong Service Centres					
Organisation	Organisational factors affecting the effective implementation of e-government in the Thusong Service Centres.					
Environment	Environmental factors affecting the effective implementation of e-government in the Thusong Service Centres					

4.6.2. Data Analysis

According to Yin (2013) data analysis encompasses investigating, categorising and organising the results to clarify the research findings. The systematic process for the qualitative approach has four procedures of analysis that include grounded theory, content analysis, thematic analysis and narrative analysis. Braun and Clarke (2006) further define thematic analysis as a method of grouping data into themes by classifying and analysing these patterns and reporting on the findings. Vaismoradi et. al. (2016) categorized content and thematic analysis as definitive logical analysis for qualitative research and are interpretive by defining the respondents' perceptions.

Neuman (2006) describe content analysis as a procedure of inspecting the data for themes and codes in a transcribed text. This procedure was utilised by Wang and Huarng (2002) for analysing online observations of clients in research to detect aspects of provisioning quality that impact e-satisfaction. So, for this study, to make interpretations in a transcribed text by addressing arrangements and configurations, content analysis was used (Darke et al., 1998).

The first stage involved the identification of patterns or significant themes that appear consistently in the collected data. Then, each theme was coded as per the identified text for each subject and usually, NVIVO software for qualitative analysis is used (Pope, Ziebland and Mays 2000). In this study, the collected data were coded and analysed by NVIVO version 10. NVIVO 10 is appropriate for a qualitative research study because it offers an organised way of storing and packaging extensive records and assists the researcher in identifying patterns in the records (Leedy and Ormrod, 2005).

Document data analysis is a methodical technique for reviewing or evaluating documents—both soft and hard copies. It requires that data be observed and understood to acquire some knowledge and understanding (Corbin and Strauss, 2008). Document analysis involves text and images within documents that have been transcribed without researcher's involvement hence Atkinson and Coffey (1997:47) refer to them as "social facts" since evidence like cultural objects are not included.

Document analysis includes browsing, understanding, and clarification of documents. This iterative process combines elements of content analysis and thematic analysis (Bowen, 2009). Bowen (2010) further warned that documents can be an important source of data, but researchers should be careful when dealing with them in research studies as they may not be specific, exact and complete interpretation of the actual events. The researcher should be guided by the research problem and objective. The next critical section is based on qualitative content analysis.

4.6.2.1 Qualitative Content Analysis

According to Zhang and Wildemuth (2009), qualitative content data analysis includes a process of condensation of raw data into groups or themes constructed on usable explanation. This process utilises inductive perspective, by which themes and codes emanate from the data collected. The analysis process also includes the construction of data at each stage of analysis; from the evident and factual content to underlying meanings. The terms used in the qualitative content analysis are shown in Table 15 below.

Table 15: Terms used in Qualitative Content Analysis (Source: Graneheim and Lundman, 2004; Mayring, 2000; Hsieh and Shannon, 2005)

Content Analysis Term	Description
Condensation	A process of condensing text transcript while maintaining its original meaning.
Code	A name that labels what the condensed text means. Usually one or two words long
Category	A grouping of all codes that relates to each other through the content. A category answers question about who, what, when, or where? In other words, categories are an expression of manifest content, i.e., what is visible and obvious in the data. Category names are factual and short
Theme	A theme can be seen as articulating an underlying meaning, i.e., latent content, found in two or more categories. Themes are expressing data on an interpretative (latent) level. A theme answers questions such as why, how, in what way, or by what means? Theme names are very descriptive and include verbs, adverbs and adjectives.
Theory	A set of interrelated concepts, definitions and propositions that presents a systematic view of events or situations by specifying relations among variables.

Hsieh and Shannon (2005) also identified three procedures of qualitative content data analysis. Their first approach is based on conventional content analysis whereby coding

categories are resultant of the raw data, which in simple terms is an approach utilised for grounded theory. The second procedure is based on a directed content analysis whereby the initial coding begins with a theory and themes emerge from the data collected. The second procedure is typically used to validate a conceptual framework. The third procedure is based on a summative content analysis whereby the initial stage is counting of words and mark content then expands the analysis to embrace themes.

Cohen et al. (2007) describe the qualitative data analysis as a method of gaining some insight from the research respondents' views and interpretations of their circumstances. This is done by linking patterns and categories that have a similar meaning. Therefore, in qualitative data analysis, the bulk of text produced by data collected from the interviews or observations needs to be condensed. This includes finding relationships or related behaviour between different themes that have been recognised. Finally, a theory could be developed and tested using advanced systematic methods. The step-by-step process is discussed in detail in the next section.

4.6.2.2. Qualitative Content Analysis Process

The qualitative content analysis encompasses an established, organised and open procedure for the handling of the collected data. The content analysis may be uniform, but it can also be separated into different steps (as shown in table 16), starting with the preparation of data and continuing through report writing.

Table 16: Content Analysis Steps

No	Step	Description
1	Preparation of Data	Transcribing of interview audio data and translating them to English Arrange tables as per the pre-coded set of features. Organise the documents and observation transcriptions
2	Knowing of data	Understanding of the collected data and familiarizing yourself with the interviewee responses.
3	Define the unit of Code	Define initial codes, therefore, defining the coding unit is one of your most fundamental and important decisions (Weber, 1990).

4	Develop categories and coding arrangement	Derive categories and coding arrangement from the following sources: data, previous literature and theoretical conceptualisation. Recheck the data consistency after coding
5	Themes identification	A theme is characterised its importance (Braun and Clarke, 2006)). Examining codes and fitting them together to form a theme
6	Review Themes for interrelations	How do the themes relate to each other? Do the themes make sense? Does the data support the themes? Are there themes within themes (subthemes)?
7	Reporting Findings	Give meaning to the data by assessing it with the literature Reporting on research findings based on content analysis is not an easy task, you also may want to integrate other options for data display, including graphs and charts (Schilling, 2006). The form and extent of reporting will finally depend on the specific research goals (Patton, 2002).

4.6.2.3. Interview Schedule Process

The interviews were conducted through face-to-face, e-mail and telephone and all transcribed to a Microsoft Word format as shown in Table 17. Some of the end-users that are utilising the Thusong Service Centres were interviewed in Xhosa and their responses transcribed to English. All the recorded audio interviews were done with an Apple iPhone 6 and Tape-A-Call App. The transcribed collected data was then captured by using NVivo software as explained in the next section.

Table 17: Interview Schedule

No	Institution	Designation	Type of Interview	Date and time of Interview
Resp1	SITA	Executive Head: Hosting and Secure Operations	e-mail interview	11/10/2019 09h34
Resp2	SITA	Provincial Head: Eastern Cape	e-mail interview	01/10/2019 11h19
Resp3	EC DEDEAT	Senior Manager: ICT	Face-to-face interview	02/10/2019 11h32
Resp4	EC DHS	Senior Manager: ICT	Face-to-face interview	30/09/2019 13h13
Resp5	EC DOH	Chief Information Officer	Face-to-face interview	03/10/2019 09h32
Resp6	DHA	Chief Director: ICT Infrastructure Management	e-mail interview	17/10/2019 09h34
Resp7	SASSA	Chief Information Officer	e-mail interview	16/10/2019 11h29
Resp8	BCM	Head of ICT	Face-to-face interview	01/10/2019 14h55
Resp9	DoT	Group Chief Information Officer	e-mail interview	06/10/2019 14h08
Resp10	Centane	Centre Manager	Face-to-face interview	21/10/2019 15h00
Resp11	Vidgesville	Centre Manager	Telephone interview	22/10/2019 09h15
Resp12	Sterkspruit	Centre Manager	Telephone interview	22/10/2019 11h00
Resp13	Cofimvaba	Centre Manager	Face-to-face interview	21/10/2019 09h00
Resp14	Jansenville	Centre Manager	Telephone interview	21/10/2019 12h05
Resp15	Centane	Centre User	Face-to-face interview	21/10/2019 15h45
Resp16	Vidgesville	Centre User	Telephone interview	22/10/2019 10h15
Resp17	Sterkspruit	Centre User	Telephone interview	22/10/2019 12h30
Resp18	Cofimvaba	Centre User	Face-to-face interview	21/10/2019 10h45
Resp19	Jansenville	Centre User	Telephone interview	21/10/2019 13h15

4.6.2.4 NVIVO Coding Procedure

The analysis of data was conducted using QSR NVivo software. The benefits of analysing data using a computer-aided software are based on four key areas as detailed by Lacey and

Luff (2009), (1) it is simple to code and re-code the data, (2) textual data searching and retrieval features, (3) management of collected data and (4) storing of enormous quantities of data. Furthermore, NVivo can be utilised to identify relationships between codes and categories. However, these benefits of utilising a computer-aided software do not limit the critical role played by the researcher concerning analysing and understanding of data (Basit, 2003).

The NVivo coding process was initiated by utilising explicit coding as explained by Morse and Richards (2002). This is then followed by expressions and phrases in the record that relates to the TOE contextual factors that affect e-government implementation. According to Anderson (2012), NVivo software label codes as nodes as a reference to the coded text. This signifies a precise theme or category that is part of the researcher's attention (Bazeley, 2007). Furthermore, Richards (2009) state that nodes are containers that categorise projects, which are linked hierarchically to the main theme, the parent node. The child nodes will then be established for each exiting parent based on the subject matter. So, every node begins as a free node and is then built up through a hierarchy to form tree nodes. The classification of tree configurations must then be linked to the research problem and assist in categorising the needed factors from the data. This is shown in table 18.

Table 18: Coded Factors based on free nodes

Tree Node	Sub-tree Node	Free Nodes (Categories)
Technological	ICT Strategy	Vision
		Interoperability
		ICT Security
		Economies of scale
		Eliminate duplication
		Indigenous languages
		Digital inclusion
	ICT Infrastructure	Data and Information
		Broadband
		Application Systems
Organisation	Organisational Culture	Standards

		Structures & Processes
		Skills
	Strategic Skills	Senior Leadership
	Collaboration	Information Sharing
	Financial Resources	Costs
	Resistance to Change	Unfreeze
		Change
		Refreeze
Environmental	Political	Political Certainty
		Political Support
	Economical	ICT Investment
	Regulatory	Legal Mandate
	Cultural	Indigenous Language

The next sections present a detailed analysis of the critical factors that impact on e-government implementation as perceived through the underlying theory of TOE. This data was collected from the set of four groups of respondents (Resp1, Resp2,.., Resp19) as shown in table 17.

4.7. VALIDITY AND RELIABILITY OF DATA

Information Systems research classified research to be positivist if there is an indication of a hypothesis testing, official proposals, quantifiable actions and drawing of interpretations about a phenomenon sampled from a definite population (Orlikowski and Baroudi, 1991). Examples of a positivist approach to qualitative research include Yin's (1994) and Benbasat et al.'s (1987) work on case study research.

IS research further classified research as critical if the key duty is seen as being one of social critique, whereby the preventive and separating circumstances of the status quo are brought to light (Alvesson and Wilmott, 1992b; Hirschheim and Klein, 1994). This is being assumed by critical theorists through individuals intentionally acting to transform their social and economic circumstances.

Therefore, for research to be interpretive it presumed that the awareness of realism is achieved only through social creations that include awareness, documents, language, shared meanings, tools and other relics. Interpretive research does not predefine dependent and independent variables, but concentrates on the intricacy of human sense as the condition arises (Kaplan and Maxwell 1994); it attempts to understand phenomena through the senses that people assign to them (Boland 1985, 1991; Deetz 1996; Orlikowski and Baroudi, 1991). Examples of an interpretive approach to qualitative research include Boland's (1991) and Walsham's (1993) work.

Klein and Myers (1999) suggested seven principles of evaluating interpretive research and these are considered a classic contribution to interpretivism, (1) the Fundamental Principle of the Hermeneutic Circle, (2) the Principle of Contextualization, (3) the Principle of Interaction Between the Researchers and the Subjects, (4) the Principle of Abstraction and Generalization, (5) the Principle of Dialogical Reasoning, (6) the Principle of Multiple Interpretations and (7) the Principle of Suspicion.

Yin (2009) also claims that to strengthen the case study evidence and test reliability and validity, it is advisable to utilise many input sources of proof. This procedure of utilising numerous techniques of information gathering is known as data triangulation (Robson, 2000; Stake, 2000). Triangulation can result from using a mixture of quantitative or qualitative approaches within a distinct case study or it can be based purely on qualitative or quantitative analysis. McClure (2002) recognised three critical methods for effective use in qualitative approach (1) interviews, (2) observations and (3) document analysis.

This study has embraced the use of triangulation to collect information from different types of sources that include face-to-face interviews and document analysis. So, the information gathered from the four sets of respondents (SITA, Thusong Service Centre managers, Chief Information Officers and citizens) including document analysis will be triangulated for reliability and validity. This will thereafter be confirmed through expert review.

Oates (2006) also provides a set of equivalent criteria for research evaluation in interpretivist research as shown in table 19.

Table 19: Criteria for research evaluation

Interpretivism
Trustworthiness
Confirmability

Dependability
Credibility
Transferability

The interpretivist criteria apply to this research as follows:

1. *Trustworthiness*: Concerning the approach employed, the trustworthiness of the experts used to refine the research framework was evaluated.

2. *Confirmability*: This criterion has been met through the use of multiple data collection techniques culminating in the expert review to confirm the outcome of the research.

3. *Dependability*: This is established through the use of literature from recognised authors and the contribution from experts in the field of study.

4. *Credibility*: Credibility has been achieved through the use of multiple data collection techniques, and the use of expert review.

5. *Transferability*: Transferability has been achieved as the research framework can be applied to other inter-organisational settings with similar characteristics.

Through the application of these five criteria, the research project can, therefore, be considered credible.

4.8. OVERALL RESEARCH PROCESS

Yin (2003) define a practical research process as a step by step action design that guides the researcher through the research. A six steps plan has been developed for this study as shown in figure 16, (1) identification of the research problem, (2) a broad literature review in the field of e-government in the developing countries, (3) understanding of the research problem and reviewing of literature empowered the researcher to develop a preliminary conceptual framework utilising the Technology Organisation Environment (TOE) framework, (4) an interview process was initiated which includes interview guide and interview questions, (5) validation of the findings and (6) development of the research contribution. The entire interview process is dependent on the ethical clearance that is approved by the council of the University; the next section is explaining this approval procedure.

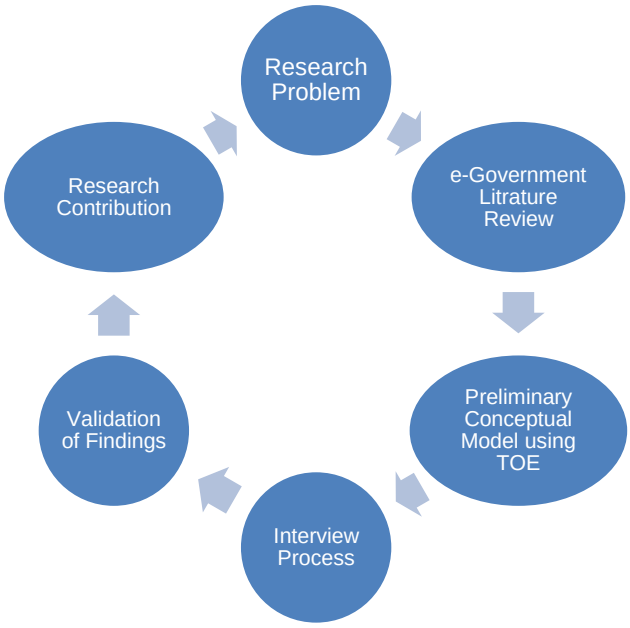


Figure 16: Overall research process

4.9. ETHICAL CLEARANCE APPROVAL

Engaging in particular research requires ethical principles and rules which will guide the researcher on how to conduct him/herself during the interview process. This is based on the rights of the respondents. An initial ethical rule includes informed consent from the respondent that he/she fully understand the process and procedures including risks and benefits for taking part in the research. Bailey (2007) suggest that informed consent needs that the respondents be informed about the purpose of the research before the start of the interview process. This will protect the respondents so that they cannot participate in the research without their approval.

The University of Fort Hare also necessitates an ethical approval for any research project supervised by the university and an application for such approval was submitted for this study using the university approval process (the ethical clearance certificate is included as Appendix A). It is also essential that that ethical approval is granted for the protection of participants, this includes privacy and confidentiality concerns during the data collection process. All respondents were given consent forms to complete as part of the interview process.

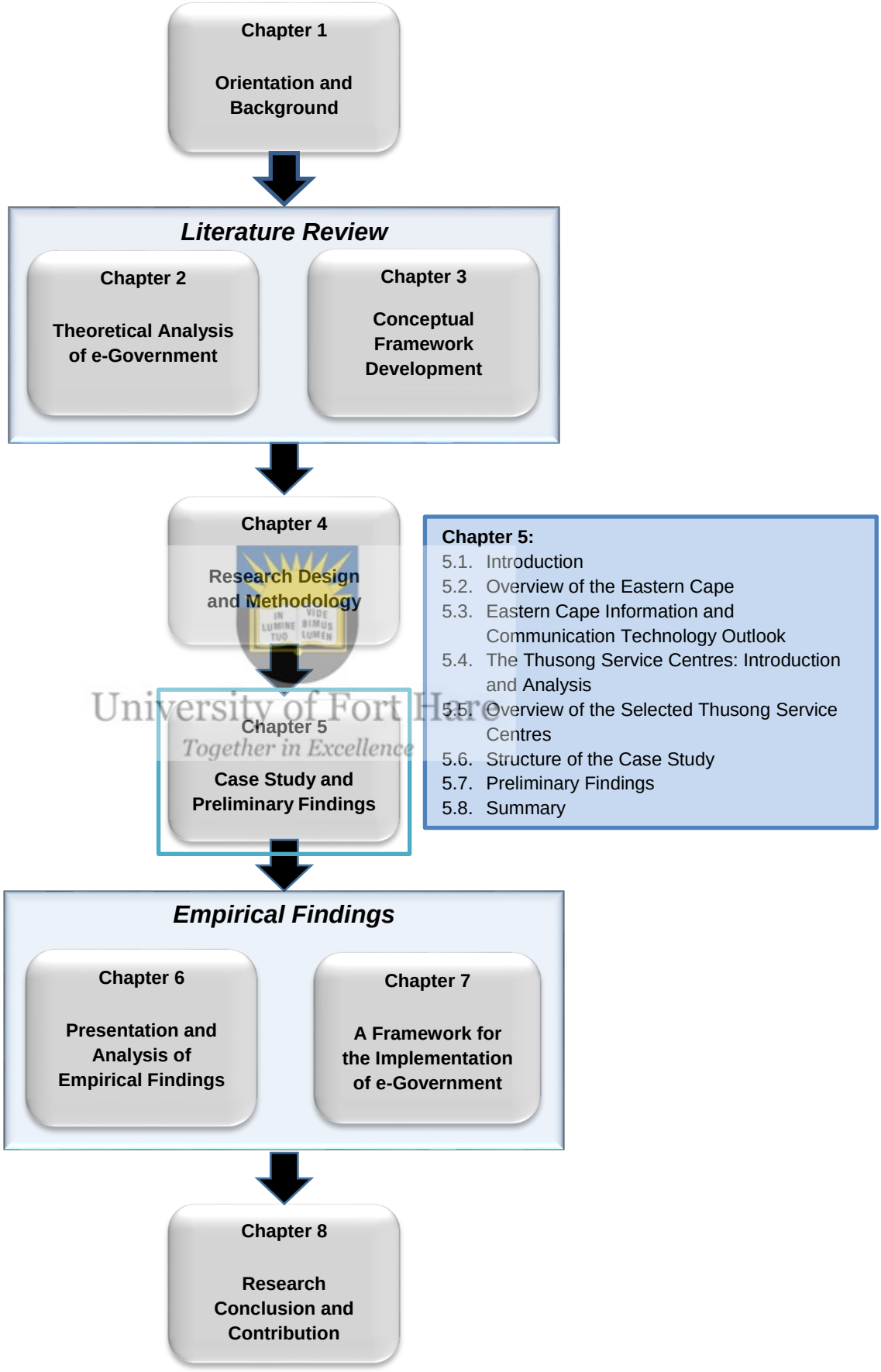
4.10. SUMMARY

This chapter detailed the research methodology endorsed for this study that assisted the researcher to capture the theoretical and practical aspects of research. The main objective was the development of a research design to guarantee the satisfactory approach of data

collection and the reliability of the process. A qualitative research approach was selected for this study since it would allow the conceptualisation of a framework including the presentation of the analysed data and using the Thusong Service Centres as the single case study.

The objectives of this chapter in identifying research paradigm, strategies and methods in solving the research problem was met and the justification of using the qualitative approach was also discussed. The research methodology recommended for this study assisted in the collection of empirical data that identified factors affecting the effective implementation of e-government in South Africa through the Thusong Service Centres, thereby answering the main research question. An expert review panel was also identified in evaluating the validity of the interview questions and the proposed e-government implementation framework. This chapter has empowered the researcher with necessary tools to collect, analyse and validate empirical data in solving the research problem. The next chapter focused on the problem area of the Thusong Service Centres as the case study including presenting the preliminary research findings.

CHAPTER 5 – CASE STUDY AND PRELIMINARY FINDINGS



5.1. INTRODUCTION

The previous chapter detailed and clarified the research methodology as it pertains to the qualitative approach adopted for this study. This chapter focused on the problem area as the case study being investigated. A case study chapter is critical in research because the researcher needs to be able to explain the uniqueness of the phenomena being investigated and differentiate it from others. The study research problem is based on the challenges affecting the implementation of e-government in South Africa through the Thusong Service Centres as a unique case. So, this chapter is based on the Thusong Service Centres as the problem area for the case study.

In understanding the problem area, it is important to focus on the socio-economic challenges of the area being investigated. This is represented by the Thusong Service Centres in the Eastern Cape Province. The profiling of the Eastern Cape Thusong Service Centres also included the role played by ICT and e-government initiatives in the Province. How these ICT and e-government initiatives are aligned to the provincial strategic plans and how the government of the Eastern Cape is driving these initiatives will also be explored.

The chapter started with an overview of the Eastern Cape Province where the Thusong Service Centres are located as section 5.2. This also includes the socio-economic and political outlook of the province. Section 5.3 discusses an ICT outlook in the province as it is seen through the Provincial ICT Strategy 2014 - 2019 and how it is influencing the Provincial Development Plan and e-government. Section 5.4 and 5.5 focus on the overview of the Thusong Service Centres and the profiling of the sampled Centres. Section 5.6 and 5.7 describes the structure of the case study and the preliminary findings of the study, respectively. Section 5.8 concludes the chapter.

5.2. OVERVIEW OF THE EASTERN CAPE

The Eastern Cape is one of the nine Provinces of South Africa, the second largest Province in the country and is situated on the south-eastern coast of Africa. This location is critical to the Province due to an international undersea fibre cable infrastructure that is laid at the bottom of the ocean. This fibre infrastructure is used for linking broadband communication networks with various countries across the world (Madyibi, 2017). The Eastern Cape comprises of two metropolitan municipalities (Buffalo City and Nelson Mandela Bay) and six district municipalities (Alfred Nzo, OR Tambo, Joe Gqabi, Sarah Baartman, Chris Hani and Amathole).

The Eastern Cape Provincial Development Plan prioritises the agro-processing sector through rural development, land and agrarian reorganization as a food safety measure for the province. Three airports contribute to the day-to-day connection between the main economic hubs of Gauteng and Kwazulu Natal provinces (ECSECC, 2016). There are two major industrial centres in East London and Port Elizabeth with three major automotive manufacturers represented, namely: Mercedes Benz, General Motors and Volkswagen. Two industrial developments precincts are currently in existence in East London and Port Elizabeth represented by the East London Industrial Development Zone (IDZ) and Coega IDZ. In October 2009, Coega IDZ completed the building of the first commercial chip anchor at the Deepwater Port of Ngqura. The two industrial zones are also involved in two eco-friendly projects that include the Fish River Spatial Development Initiative (SDI) and the Wild Coast SDI. The socio-economic outline of the Eastern Cape Province is also of great influence on the overview of the Province as described in the next sub-section.

5.2.1. Eastern Cape Socio-economic Outlook

According to Eastern Cape Socio-Economic Consultative Council (ECSECC) (2016), the economy of the Eastern Cape is export-focused and increasingly contemporary with growth potential. The advantages of this growth potential are based on its topographical location, the richness of natural resources, quality sea and world-class airports. The province has also boosted its exports as industrial goods. The Provincial Development Plan (PDP) (see sub-section 5.3.1) also outlined an inventive way of drawing the rural communities, who live mostly on subsistence agriculture, migrant labour and welfare grants, into the conventional economy. DEDEAT (2017) also formulated a socio-economic plan for the province following the required economic development.

In 2015 the Gross Domestic Product (GDP) of the Eastern Cape was assessed at R230.3 billion with an estimated growth of 0.6%. This made the Eastern Cape the fourth largest provincial economic growth in South Africa (DEDEAT, 2017). The recent provincial lowered economic growth rate has negatively affected job creation in the key sectors of industry. However, there was a gain of 1% from the sectors of mining, utilities and community services during the same period (DEDEAT, 2017).

Social inclusion and accessibility of government services go hand in hand with improving service delivery to citizens. The first component of addressing this is the actual availability of government services online. The second component is widespread connectivity. The third component is access to consumer technologies that allow citizens to access the services. The most effective way to deal with the latter is to ensure that government services are accessible

via mobile devices. In January 2018, South Africa recorded internet penetration of 54% (30.8 million South Africans), up 2% from 52% in January 2017. A total of 29.2 million of the population (51%) access the internet on their mobiles (Statistics SA, 2019).

In the current digital era where internet usage is most commonly associated with electronic communication, there is also a high potential risk of cyber-attacks. The focus now by cybercriminals has shifted from simple online attacks to more business and financial intelligence including unlawful access to government data (DTPS, 2016).

5.2.2. Political Outlook

The situation is one of relative political stability however the municipalities are mostly struggling, especially concerning viable leadership control and financial operations. This hampers their ability to deliver services such as ICT infrastructure that is required for the laying of fibre for Broadband (Eastern Cape Provincial Strategy 2019-2024). The Eastern Cape government recognises the important role that ICTs play in delivering services to its citizens. It also recognises both the positive and negative impacts that the use of ICTs has on the sustainability of our planet hence the next section focuses on the ICT outlook in the Eastern Cape.

5.3. EASTERN CAPE INFORMATION AND COMMUNICATION TECHNOLOGY OUTLOOK

The Eastern Cape Provincial ICT Strategy 2019-2024, emphasises that the ICT ecosystem in the Province has been growing at a phenomenal pace since 1996 to date. The Government Campus Metropolitan Area Network (MAN) as an example has increased from locally connected government buildings to a Wide Area Network (WAN) that connects remote sites as a typical enterprise network and includes silo voice communication (VoIP) services (SITA, 2018).

The ICT support structure in the Province, however, has not been adjusted to cope with the increasing demand. The rapid growth in the ICT ecosystem was mainly caused by computerised business processes, which results in an ever-increasing dependency on these technologies for the rendering of services. ICT has moved from being merely a convenient way of online services to a mission-critical strategic service. (Office of the Premier, 2017)

There is also an abundance of data that has been created through government departments that is both structured and unstructured. There is also a big challenge and an enormous task of storing, securing, and making this data readily available (Office of the Premier, 2018). Improving the ICT ecosystem in the Province is the only option for a business that wants to

keep their house in order (Provincial ICT Strategy, 2019-2024). This is also articulated in the Eastern Cape Provincial Development Plan (2014) as an extension of the National Development Plan.

5.3.1. The Eastern Cape Provincial Development Plan (PDP)

The Eastern Cape Planning Commission (ECPC) engaged with various sectors of society which included previously disadvantaged groups in identifying growth priorities for the province. This was the birth of the Eastern Cape Developmental Plan (PDP) 2015 – 2030 or Vision 2030. This statutory body was formed in 2012 and aligned to the National Planning Commission (NPC) in complementing the objectives of the long-term vision of the National Development Plan (NDP) (Provincial Planning Commission, 2015).

The PDP has identified five related goals that are focusing on rural development and addressing the spatial and structural disparities of the past. The summarised logical relationship of these goals with their key objectives is depicted in figure 17 below.

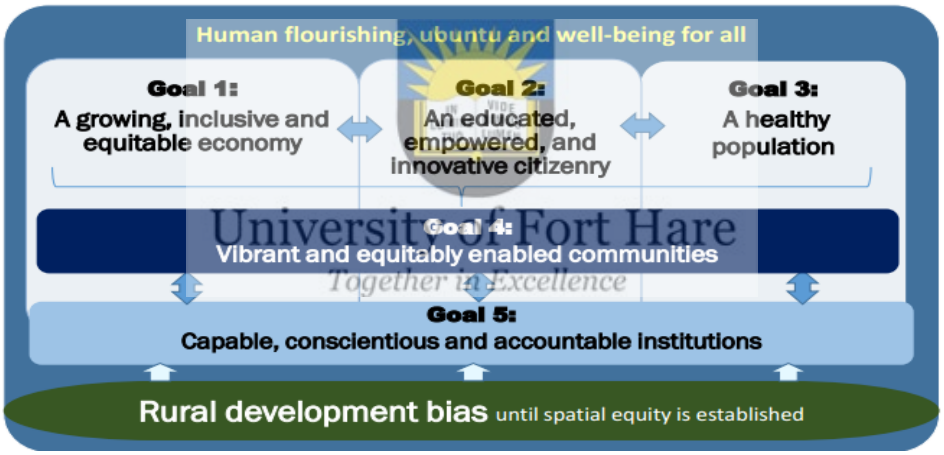


Figure 17: Logical relationship of the five goals (Source: Eastern Cape Provincial Development Plan, 2015)

The first three goals are categorized as the core with economic growth, education and knowledge enablement at the centre. The goals complement each other, for an example, for inclusive economic growth there must but an educated, healthy and empowered citizenry. The fourth goal is through the realisation of the first three goals, whilst the fifth is influenced by the initial four goals (Provincial Planning Commission, 2015).

The e-government is captured in all PDP goals as explained in the previous literature review chapter (Section 2.12.2). This includes the public sector transformation, more efficient provincial economic growth, reduced unemployment and abolishment of disparities. These

PDP goals are further aligned to the Provincial ICT Strategy 2019 – 2024 as discussed in the next sub-section.

5.3.2. The Provincial ICT Strategy (2019 – 2024)

The Eastern Cape Provincial Government (ECPG) has recognised that ICT can play a major role in the efficient delivery of government services to the citizens. The Provincial ICT Strategy 2019 - 2024 envisaged that ICT will empower the public service to function in a more integrated, well-organized and efficient government for the benefit of citizens (Provincial ICT Strategy, 2019 – 2024).

The Eastern Cape ICT Strategy outlines the approaches and standards that the provincial departments must undertake to deliver various services to the citizens. The full implementation of the strategy will ensure a new exemplary for the efficient delivery of services across provincial government entities. The strategy consists of five different but interconnected strategic themes:

1) Connected communities in a connected province
2) Digitally transformed (or e-government) and operationally effective province
3) Data and knowledge-driven
4) Innovation, governance and technology adoption
5) Skills, capacity and change management

The 5 Strategic Themes lead to the following objectives and are aligned to the PDP as summarised in Table 20.

Table 20: Strategic objectives alignment to the Provincial Development Plan (Source: Provincial ICT Strategy, 2019 – 2024)

Strategic Objective	Commitment	Alignment to the PDP
Build to Share	Implementing an ICT shared service for integrated public service provision; for efficiency, effectiveness and reduction of costs	• Build resilient economic infrastructure that promotes economic activity. • Universal access to basic infrastructure

Digital First through e-government	The utilisation of ICT in delivering online government services to citizens, businesses and public servants.	• Drive digital transformation and development of the ICT sector for the benefit of citizens, business and other government entities
Data as an Enabler	Improved collaboration in data sharing and inventive use of data through all government entities	• Improve infrastructure ecosystem for planning, delivery, operations and maintenance
Improve Governance and Innovation	Aligning, directing and monitoring of ICT Strategy across government entities	• Realise a developmental, capable (professional, accountable, innovative well-coordinated), and ethical state that treats citizens with dignity.
Increase Capability	Provision of necessary ICT skills and resources across government entities	• Skills development for economic development

The ability to store, share, and analyse knowledge through these five strategic objectives using ICT allows the Provincial Administration in exploiting the unique properties of knowledge to gain competitive advantage. The Eastern Cape Provincial Government has set itself on a path to develop the Province into a digitally transformed society. Let us then focus on the strategic objective number 2, the Digital First through e-government as explained in the next sub-section.

5.3.3. State of the Province Address (2018)

The Premier of the Eastern Cape announced in 2018 various initiatives and a Programme of Action (PoA) for all the Provincial sector departments. Some of the most critical challenges announced include:

1) ***Better access to quality education*** – this will be achieved through the Strengthening of the administration and management of curriculum delivery in public schools especially in quintile 1-3; Improving the quality of primary education through some interventions including training of educators and use of ICT.

2) ***Promoting better healthcare for all our people*** – the objective is to address the social determinants of health and to improve health outcomes and quality of life of our people through the usage of broadband technologies, for example, Tele-medicine.
3) ***Stimulating rural development, land reform and food security in the Province*** – by utilising ICT for rural development which in turn requires the e-government initiative.
4) ***Transformation of the economy to create jobs and sustainable livelihoods*** – by tasking the Department of Economic Development, Environmental Affairs and Tourism with the consolidation and coordination of support to all Cooperatives as well as commitment to formulate a Provincial Maritime Skills Development Plan.
5) ***Infrastructure especially roads are a critical enabler to access and mobility*** - through collaboration with SANRAL, the provincial government is continuing to upgrade provincial and national roads within the province. For the e-government solutions to education and health sector, the rollout of Integrated Financial Management Systems (IFMS), will be piloted in two sites in the Province, namely, Department of Social Development and Provincial Treasury.
6) ***Strengthening the developmental state and good governance*** - through the Back to Basics Programme, the Province is providing hands-on support to municipalities throughout the Province. It is also rolling out so-called "War Rooms" in all wards to promote citizen participation in planning and to address the need for accountability and effective performance management at all leadership levels in the Provincial Administration. Measures to foster accountability and consequence management will be developed and implemented to enhance Service Delivery and Performance Agreements.

In 2018/19 the Province further intends to pay more attention to programmes that will bolster social inclusion, social capital and social mobility as key components of nation-building and social cohesion. These programmes will include fostering constitutional values, offering equal opportunities, promoting inclusion and redress through increased interaction across race and class, as well as promoting active citizenry (SOPA, 2018).

All these Provincial initiatives or priorities require a provincial e-government initiative, for example, broadband-enabled technologies are redefining traditional notions of education and are leading to the development of a new, learner-centric education paradigm. In particular, broadband-enabled technologies:

1) Improve the effectiveness of instruction and enhance learning outcomes through more engaging, interactive activities;

2) Encourage innovation in how education is delivered, which has resulted in several hybrid approaches to teaching (e.g., blended learning);
3) Enable a wider array of professional development opportunities for educators and adult learners;
4) Enhance access to quality education via distance learning programs, online learning modules, and the availability of relevant content from any location;
5) Enable a range of administrative efficiencies. For example, some affordable cloud computing services are streamlining and automating numerous administrative functions; and
6) Facilitate the collection and analysis of greater amounts of student data to more accurately track student performance (Davidson and Santorelli, 2010).

Such impacts, however, are dependent on the wide availability and robust adoption of broadband and educational technologies inside and outside of the classroom, as well as on the willingness and ability of educators to incorporate these technologies into lesson plans.

In Healthcare, broadband access is not usually highlighted in policy prescriptions for improving outcomes and lowering costs of health care. But it is a prerequisite for a range of technologies that can provide more cost-effective and higher-quality care, such as video consultation, remote patient monitoring, and electronic health record operability. In many places, particularly rural areas of the Eastern Cape that have the most to gain from telemedicine and connectivity, broadband remains too expensive, unreliable, or simply not available at the speeds required to enable innovations in care. This “connectivity gap” remains an important obstacle to achieving better healthcare in rural areas. Many of the recommendations outlined in the National Broadband Policy or SA Connect (2013) have not yet been implemented, despite their potential to reduce the connectivity gap and increase the impact on social cohesion.

5.3.4. Provincial Infrastructure Plan

The Eastern Cape Socio-Economic Consultative Council (ECSECC) has been mandated by the Office of the Premier to develop the plan that will be “comprehensive and integrated, covering the entire span for social and economic infrastructure”. The terms of reference for the project state that the plan will be “a response to the socio-economic imperatives and vision of the Eastern Cape and will provide a basis for integrated infrastructure delivery as well as resource prioritisation and allocation”.

The main purpose of the Eastern Cape Provincial Infrastructure Plan (ECIP), flowing from the Provincial Development Plan (2014), is to derive more value from the large public expenditures on infrastructure assets. This is to be achieved through improved infrastructure planning combined with complementary and simultaneous efforts to improve infrastructure delivery management. Provincial infrastructure delivery is being improved through the implementation of National Treasury's Infrastructure Delivery Management System (IDMS) and the subsequent Standard for Infrastructure Procurement and Delivery Management (SIPDM), using PT's "Strategic Framework to Improve Infrastructure Delivery" and a new OTP/PT interim Rapid Response Team that is presently being assembled.

ECIP is an attempt (the first in the Eastern Cape) at macro-level infrastructure planning, to identify key strategic priorities and actions that are necessary to achieve defined long-term goals. ECIP is partly based on existing sector-level infrastructure planning, which is of very variable quality: some good, and others still almost non-existent (such as Eastern Cape Department of Education).

ECIP sets four high-level goals for 2030:

1) Infrastructure investment responds to spatial aspects of future infrastructure demand and progressively undoes apartheid geography.
2) The provision of infrastructure is accelerated to achieve universal access to social services.
3) Infrastructure investment helps to unlock economic potential.
4) Infrastructure planning, delivery, operation and maintenance are improved

These goals are to be achieved through the implementation of ten Provincial Strategic Projects (PSP's):

1) Strategic catalytic projects;
2) Small Town Development;
3) Urban settlements infrastructure;
4) Water and Sanitation;
5) Energy and electricity;
6) Agro-logistics;
7) Education and health;
8) Roads;
9) ICT and Broadband; and
10) Enabling interventions.

5.3.5. Provincial Broadband Master Plan

The Eastern Cape Broadband Master Plan is a “plan of plans” whose main objective is to ensure that the Eastern Cape has broadband infrastructure covering all priority areas and this infrastructure is effectively utilised for socio-economic development and is accordingly maintained and enhanced as needs evolve. Further and more specific plans have to be developed within the guidance of this master plan. This master plan seeks to build on the provincial ICT strategy and establish some detail to achieve the goals of "connect the Eastern Cape" as established in Programme 6 of the provincial ICT strategy. The interdependence between the broadband infrastructure development and its use, its affordability and skills to use and develop applications is recognised.

This Broadband Master Plan takes cognisance of national and other efforts impacting broadband penetration in the Eastern Cape and seeks to complement and guide these efforts to foster economic, social and developmental advantage for the province. This provincial broadband master plan builds upon the National Broadband Policy (South Africa Connect), as gazetted under Gazette No 37119, and is therefore intended to complement it to create an actionable plan for the Eastern Cape (Eastern Cape Broadband Master Plan, 2015).

The essence of the Master Plan intends to improve broadband infrastructure reach, the skills to operate and use broadband and drive the use of broadband for the following:

1) Government operations and services.
2) Utilities and infrastructure development projects associated with the Strategic Infrastructure Projects (SIPs) and development corridors to make this smart and green infrastructure.
3) Improve the economy (including agriculture, renewable energy supply and tourism).
4) Improve citizen access and well-being (which includes households, education, hospitals and security).

It should be noted that the Master Plan excludes the two Metropolitan Municipalities, namely, Nelson Mandela Bay and Buffalo City as they can develop their plans and manage the roll-out of broadband. In so doing, the Metros, however, have to ensure alignment with a national broadband policy framework and provincial policy imperatives.

5.3.6. Provincial Telecommunications Position Paper (2016)

A Telecommunications Position Paper (2016) was developed by the Office of the Premier Broadband Task Team (BTT) and presented to the Executive Authority (EA) of the Province.

The Position Paper was officially endorsed by the EA with recommendations focusing on the funding model of the project. This paper aims to illustrate the importance of this telecommunications infrastructure in achieving the objectives of the province and presents a case for the need for government intervention in this space. The idea is to use this document to foreground the development of a more comprehensive Provincial Telecommunications Infrastructure Strategy that will be used to drive telecommunications infrastructure development in the province.

This Position Paper, therefore, argues that:

1) The development of a robust and affordable high-speed broadband must be recognised as a priority initiative for the Eastern Cape Provincial Government (ECPG) intervention. This intervention must consider the entire telecommunications ecosystem (networks, services, applications, and users); and
2) The role of the ECPG as a driver for the development of this infrastructure must be recognised. The way that ECPG uses ICT has to radically change from being a passive recipient of what the current market and players have to offer to be a driver (pump) for the creation of a new telecommunications landscape in the Eastern Cape.

The previous sections give a socio-economic overview of the Eastern Cape and how the e-government initiative fits into the strategic objectives of the Province for the improvement of its socio-economic status and what positive role can it play as the priority of Government. The next sub-section will focus on e-government in the Eastern Cape.

5.3.7. E-Government in the Eastern Cape Provincial Government

The literature review chapter (Section 2.12.3) explained how SITA as an ICT agency of government is responsible for the implementation of e-government in South Africa. The guiding e-government strategy for the country was developed by the Department of Communications and Digital Technologies (DCDT) in conjunction with SITA. Therefore, provinces including the Eastern Cape then align their provincial strategies with the national mandate hence the Eastern Cape Provincial ICT Strategy (2019 – 2024) has a focus area on e-government goal.

The implementation of e-government is currently taking place in many service delivery points of government in the Eastern Cape. For example, significant progress has been made in the development planning of the Integrated Financial Management Systems (IFMS) with particular focus on Human Resources, Budgeting and Finance, Asset Management and Supply Chain Management. The IFMS project is also supported by key e-government projects that include

e-Recruitment (an online recruitment system in the public sector), e-Records (for online records management in government) and e-Leave (for the management of leave in the public service) (Provincial ICT Strategy, 2019 – 2024). The question now arises - is the ICT infrastructure in the Province capable of sustaining the implementation of all these e-government initiatives?

The latest International Telecommunications Union (ITU) global broadband rankings report (2015) stated that in 2014 the population of South Africans having access to the Internet was sitting at 48.9% which was a 7.9% increase from the previous year. South Africa was ranked 37th within the developing countries which was also an increase compared to the previous year when sitting at 44. In terms of mobile broadband penetration, the South African figure for 2013 was at 26% (United Nations Report, 2015).

Filtering down to the Provincial level, the Internet access for the Eastern Cape was 25.5%. The leader for internet access in provinces was Gauteng at 54.7% followed by the Western Cape at 54.3%, Free State at 42.1% and Limpopo at 21.3%. See Figure 18 below.

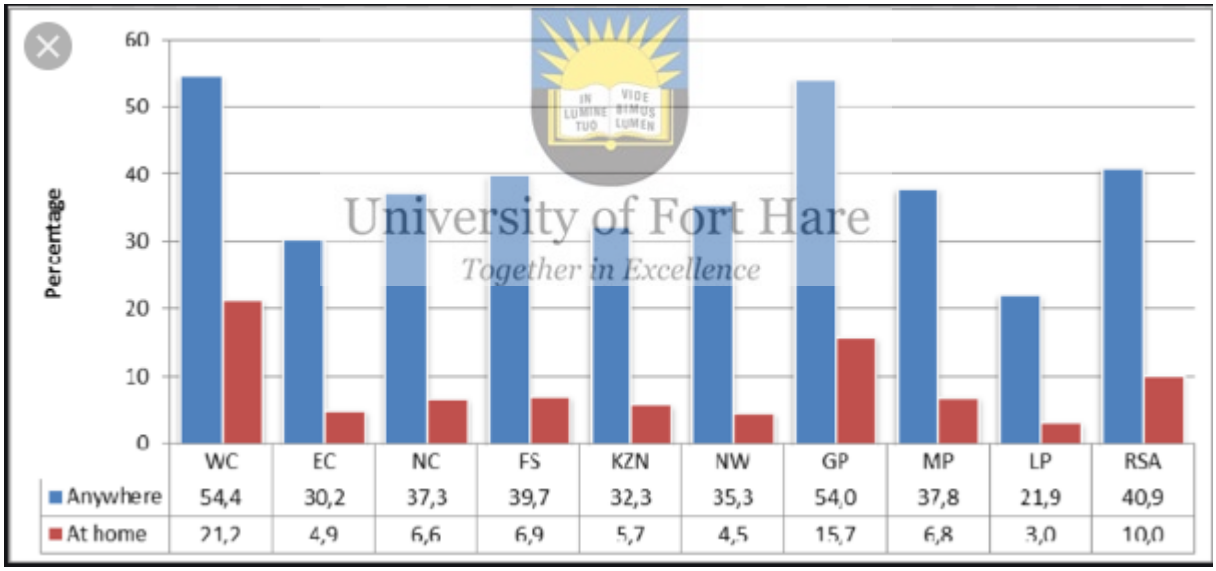


Figure 18: Households percentage with access to the Internet by province (Source: Statistics South Africa, 2013)

The Eastern Cape Province has five major broadband service providers that have rolled out a Broadband Backhaul or Backbone across the Province, namely, Telkom, Transnet, Dark Fibre, Broadband InfraCo, and FibreCo. See figure 19 below.

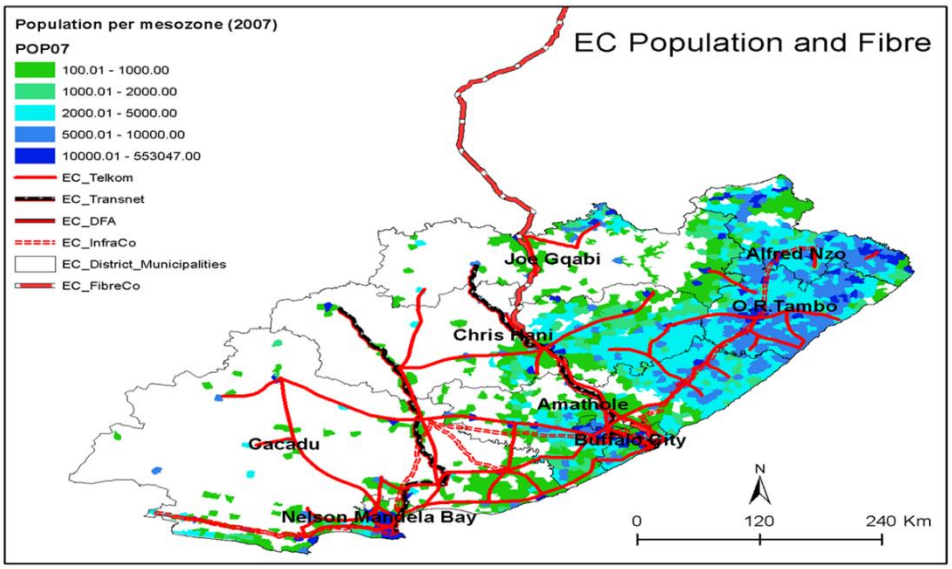


Figure 19: Broadband backhaul in the Eastern Cape Province (Source: Centre for Scientific and Industrial Research, 2013)

The combination of Broadband and e-government have a crucial role in developing and transforming government. They deliver many benefits to both consumers and government and significantly improve how the government understands and engages with its citizens (Provincial ICT Strategy 2019 - 2024). In addition to improving service delivery, the adoption and implementation of e-government also allow the government to reduce costs and improve service delivery; thereby streamlining processes and remain ready for the ever-approaching future as per the objectives of the Provincial Development Plan (PDP, 2014). See Figure 20 below.

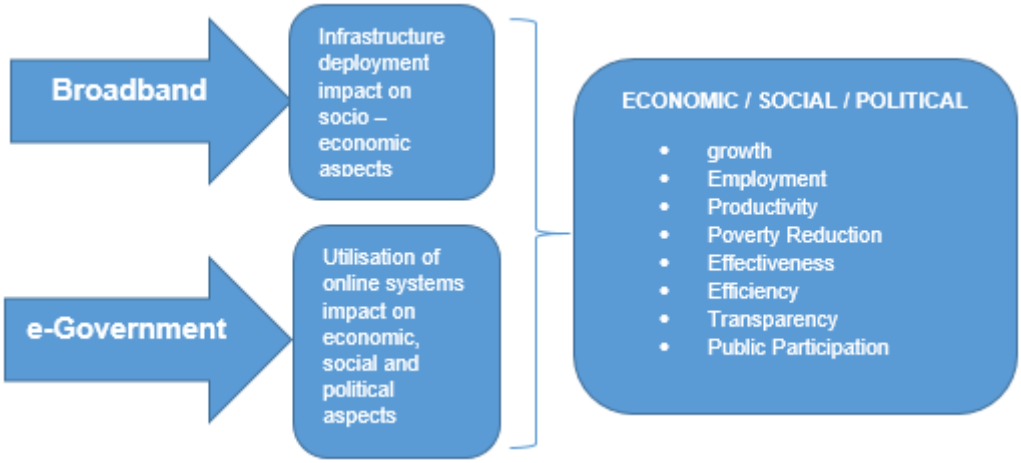


Figure 20: Impact of broadband and e-government on the Provincial Development Plan

The expectation by citizens for government to deliver on services relies on the usage of ICT and Internet; these expected demands for social change will continue to drive the government to deliver better services (Gupta and Jana, 2003; Layne and Lee, 2001). According to GCIS (2009), another key prerequisite for the delivery of these much-needed services is the political will to motivate government programmes that are aimed at refining the lives of the rural communities. In South Africa, the government has responded by creating the Thusong Service Centres as the of government service centres for delivery of online government services to these communities (GCIS, 1996). The detailed analysis of these Thusong Service Centres as the case study is the focus of this study as explained in the next section.

5.4. THE THUSONG SERVICE CENTRES: INTRODUCTION AND ANALYSIS

In 1999, the South African government embarked on an effort to utilise ICT to provide for the citizens' needs by constructing integrated one-stop centres called Multi-Purpose Community Centres (MPCC) or Thusong Service Centres. "Thusong" means a place of assistance. Harris (2001) and Harris et. al. (2003) define a multi-purpose community centre as a facility that provides access to government services by utilising ICT. Benjamin (2008) also in agreement with Harris (2003) in further defining a Multi-Purpose Community Centre as a building structure that is sufficiently resourced for the provision of public service to the communities efficiently and effectively. This also empowers the community to be part of the decision-making process for initiatives that are introduced both by the government and public it serves.

These centres, which are sometimes referred to as telecentres, are also used for educational, personal, social and economic development in these rural communities. These Centres were for the provision of information and services to rural communities through the participatory development communication approach (GCIS, 1996).

The initial government target for these Thusong Service Centres was to build at least one centre for each district by 2004. This resulted in 87 centres being established by March 2007 across the country and providing more than 700 online services from various government departments (GCIS, 2016). In the Eastern Cape, there are 13 Thusong Service Centres (TSCs) scattered across the Province and the focus of this study will be a sample of six centres. The objectives, guiding pillars and structure of these Centres is discussed in detail in the following sub-sections.

5.4.1. Objectives of the Thusong Service Centres (TSCs)

The Thusong Service Centres were mainly established in rural and disadvantaged communities offering various government information services with the following strategic objectives as detailed in the Business Plan of the TSC (GCIS, 1996):

1) Promoting access to prospects for better-quality services for communities by bringing government information and services closer to the people;
2) Promoting integrated service provisioning for economical and effective service delivery to the citizens;
3) Building a structured partnership between government, business and citizens for sustainable rural economic development; and
4) Ensuring a platform for public participation in government challenges.

The report on the Assessment of the Effectiveness of Thusong Service Centres in Integrated Service Delivery conducted by the South African Public Service Commission in 2010 found that the Thusong Services Centres (TSCs) have significant influence towards enhancing access to government services in the rural poor communities. The accessibility of critical government services has assisted numerous service users in avoiding travelling long distances just to access services. However, a critical challenge that seems to be affecting the Thusong Service Centres is the lack of an appropriate institutional framework for the global management of these Centres (Burton and Nel, 2012). This has also affected the financial sustainability of these Centres where the government has provided the equipment for the centres but failed to offer a budget for operational costs. Secondly, there is a shortage of resources and poor internet connectivity in these Centres (Gcora et al., 2015).

5.4.2. Guiding Pillars of the Thusong Service Centres

The TSCs were built around six pillars based on a service model with the following functions:

1) Government Services: Provision of government services from various sectors of the public service including health, education, welfare, unemployment insurance fund.
2) Office Services: Postal services, telecommunication facilities and other office administration amenities.
3) Education and Skills Development Services: Specialised e-literacy training, adult-based learning and community growth skills.
4) Local Economic Development Services: Small business training skills, tender information and rural development skills.

5) Information and Communication Services: Government information services, online government services and government awareness programmes.
6) Business Services and Community Opportunities: SMMEs business opportunities and asset-based community development opportunities.

These guiding pillars are summarized as shown in figure 21 below.

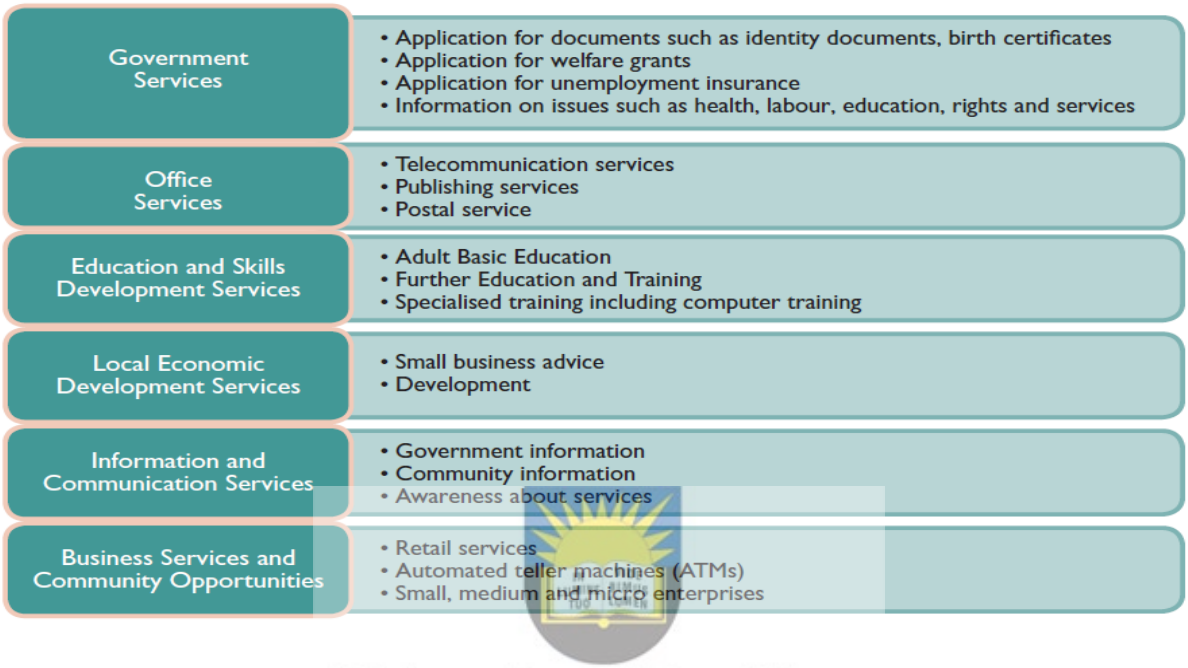


Figure 21: Six block guiding pillars for Thusong Service Centres (Source: TSC Business Plan, 1996)

For these Thusong Service Centres to be operational they need to fulfil certain conditions which include a management structure to run the day-to-day operations of the centre which is the focus of the next subsection.

5.4.3. Organisational Structure of the Thusong Service Centre

These Centres are established within the local municipalities hence they should form part of the holistic municipality Integrated Development Plan (IDP) for that particular municipality with the following organisational structure:

1) An established Centre Management Committee (CMT) that will ensure the proper functioning of the centre including monitoring the delivery of service to communities; it will further ensure the availability of resources for productivity.
2) An appointed Centre Manager (CM) that will ensure the day-to-day operations of the centre are fulfilled; these include ensuring that agreements are properly signed with the service providers; also marketing the centre for its services.

3) Departmental representatives servicing the communities with the specific services for that particular participating department.

The overall organisational structure for each centre is represented in figure 22.

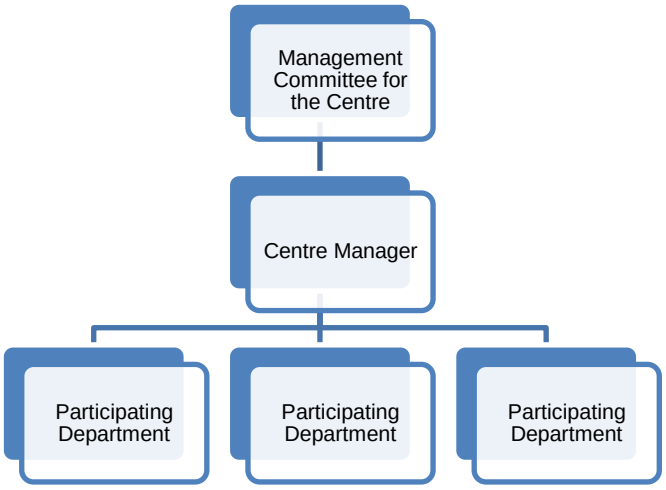


Figure 22: Organisational structure for each Thusong Service Centre (Source: GCIS, 1996)

The Department of Public Service and Administration (DPSA) had set up service standards that would be used to monitor and evaluate the delivery of services by the participating departments. This task was mandated to the Office of the Public Service Commission (PSC, 2010). The next section will focus on the profiles of the five sampled Thusong Service Centres, namely (1) Centane (2) Vidgesville (3) Sterkspruit (4) Cofimvaba (5) Jansenville.

5.5. OVERVIEW OF THE SELECTED THUSONG SERVICE CENTRES

The TSCs in the Eastern Cape are spatially distributed across the province as shown with red circles in Figure 23 below. The profiles of the selected Thusong Service Centres are also shown in Table 21 below.

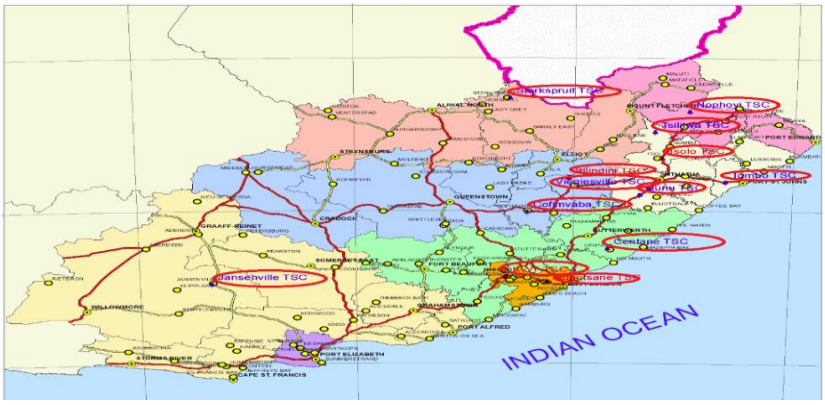


Figure 23: Eastern Cape Thusong Service Centres (Source: Eastern Cape Office of the Premier, 2017)

Table 21: Profile of the Thusong Service Centres (Source DPSA, 2016)

Thusong Service Centre	Local Municipality	District	Area	Population Density	Average Household size	Participating Departments
Centane	Mnquma	Amathole	3,272 km²	77 people per km²	4	Justice, SASSA, Health, SAPS, DEDEAT, Home Affairs
Vidgesville	King Sabata Dalindyebo	OR Tambo	3,030 km²	149 people per km²	4	Home Affairs, Health, SAPO
Cofimvaba	Intsika Yethu	Chris Hani	2,713 km²	54 people per km²	4	SASSA, Hone Affairs, GCIS
Jansenville	Ikwezi	Sarah Baartman	4,565 km²	2 people per km²	4	Home Affairs, SASSA, Labour
Sterkspruit	Senqu	Joe Gqabi	7,336 km²	18 people per km²	4	Home Affairs, Labour, DEDEAT, SASSA

The profiling of these Thusong Service Centres allowed the researcher to understand the environment in which these centres are operating, but first, there is a need to understand the structure of the case study as explained in the next section.

5.6. STRUCTURE OF THE CASE STUDY

This research study was based on findings from four sets of respondents (1) the State Information Technology Agency (SITA) project managers who are the agency of government responsible for the provision of ICT services in government including e-government project, (2) the Chief Information Officers (CIOs) from various departments Nationally and in the Province that are partaking in the implementation of e-government in the TSCs, (3) the TSC Managers liable for the daily running of the centre and (4) the community end-users who are utilising the centres. The following subsections explain and display the organisational structures for SITA and the Provincial GITO Council representing the Provincial CIOs as part of the respondents.

5.6.1. Organisational Structure for SITA

The role of SITA is to consolidate and coordinate the State's Information Technology assets to achieve cost reduction, improve interoperability and deliver online services to citizens,

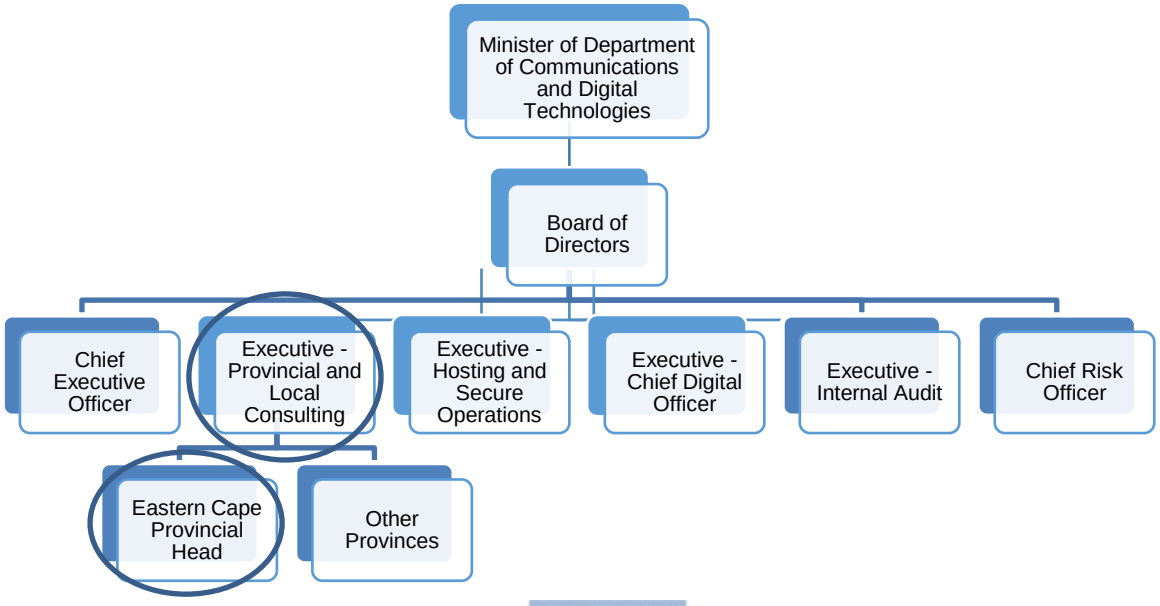


Figure 24: SITA organisational structure

business and government entities. SITA offers ICT solutions to numerous national, provincial and local government departments. These services are provided to government entities through the SITA act of 1998 (SITA, 2016). The organisational structure for SITA is represented in figure 24. The circled portfolios within the structure in figure 24 are the main SITA executives that were selected as respondents for the study. They are solely responsible for the implementation of e-government in the South Africa public sector both national and provincial.

5.6.2. Organisational Structure for Provincial GITO Council

The PGITO Council is the main ICT structure in the Province that is based on inter-departmental formation and focuses on guiding the public service on ICT challenges. The PGITO Council structure supports the Provincial Chief Information Officer (CIO) on operationalisation and implementation of ICT policies and procedures (Office of the Premier, 2013).

The PGITO Council includes the CIOs or Senior ICT Managers from 13 Provincial government departments and a representative from the Local Government Information Technology Council (LGITC). Each of the 13 provincial departments has its own Member of Executive (MEC) as the political head, Head of Department as an Accounting Officer and a CIO or Senior Manager

ICT depending on the size of the department. All 13 departments have established ICT Governance structures with their ICT Governance Framework and Charter documents and all their sittings are monitored by the Office of the Premier as the custodian of the ICT Governance initiative. The organisational structure of the PGITO Council is represented by figure 25 below (circled in blue).

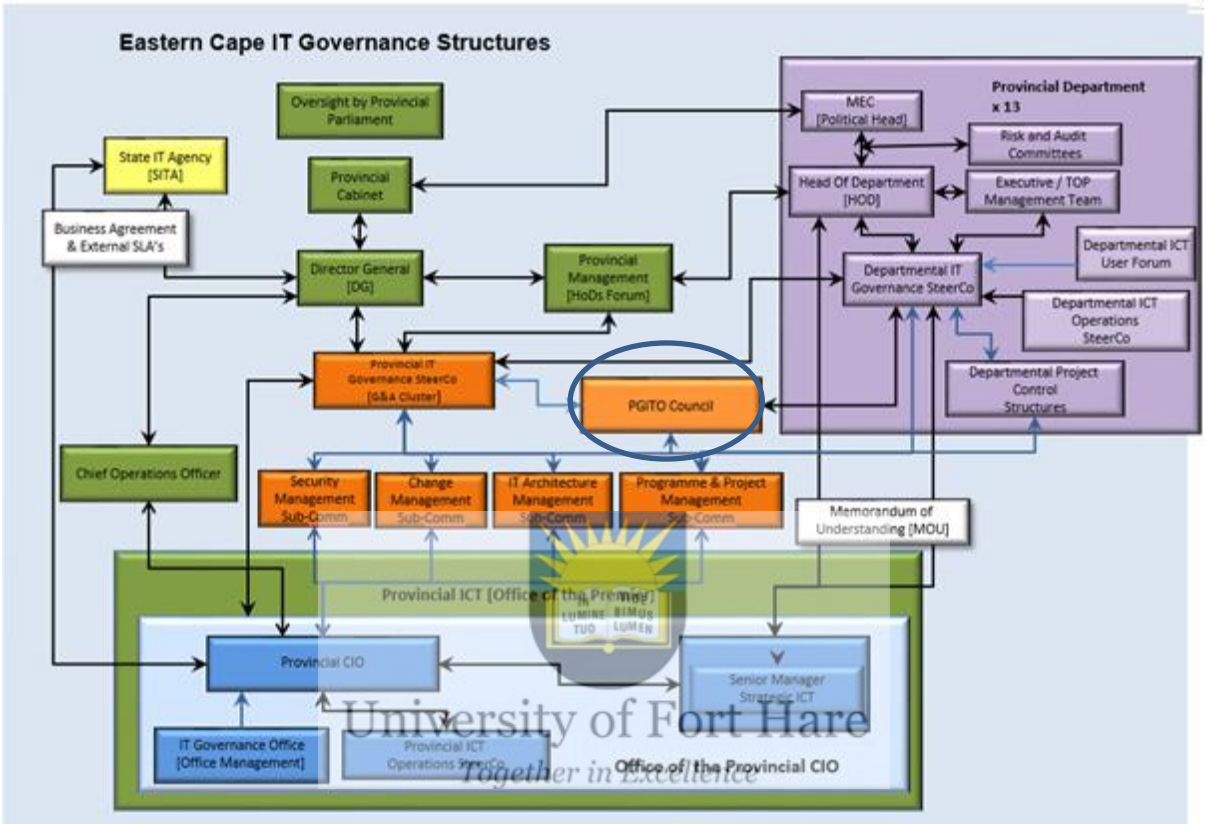


Figure 25: Eastern Cape IT Governance Structures

5.6.3. Interview Respondents

A set of 10 questions was prepared for each set of respondents and e-mailed to all the respondents before the interview so that the respondents can familiarise themselves with the questions. A preliminary study was also performed before the main interview process and this is represented by section 5.6. The respondents for the main study were structured as shown in Table 22 and Figure 26 below:

Table 22: Interview Respondents Categories

Respondent No.	Institution	Designation	Role
Resp1	SITA	Executive Head: Hosting and Secure Operations	In charge of e-Government projects in South Africa
Resp2	SITA	Provincial Head: Eastern Cape	Responsible for the Provincial Office for SITA
Resp3	Department of Economic Development and Environmental Affairs and Tourism (Eastern Cape) (EC DEDEAT)	Senior Manager: ICT	Responsible for the strategic management of ICT in the Department
Resp4	Department of Human Settlements (Eastern Cape) (EC DHS)	Senior Manager: ICT	Responsible for the strategic management of ICT in the Department
Resp5	Department of Health (Eastern Cape) (EC DOH)	Chief Information Officer	Responsible for the strategic management of ICT in the Department
Resp6	National Department of Home Affairs (DHA)	Chief Director: ICT Infrastructure Management	Responsible for Systems and Applications across the Home Affairs department
Resp7	National SASSA	Chief Information Officer	Responsible for the strategic management of ICT in the Department
Resp8	Buffalo City Metropolitan (East London)	Head of ICT	Responsible for the strategic management of ICT at BCM
Resp9	National Department of Transport (DOT)	Group Chief Information Officer	Responsible for the strategic management of ICT in the Department
Resp10	Centane TSC	Centre Manager	Liable for the daily operations of the Centre

Resp11	Vidgesville TSC	Centre Manager	Liable for the daily operations of the Centre
Resp12	Sterkspruit TSC	Centre Manager	Liable for the daily operations of the Centre
Resp13	Cofimvaba TSC	Centre Manager	Liable for the daily operations of the Centre
Resp14	Jansenville	Centre Manager	Liable for the daily operations of the Centre
Resp15	5 x End-Users from the five TSC	End-User	Responsible for utilising the TSC
Resp16	5 x Review Panel	Expert Review	Responsible for the review of the study

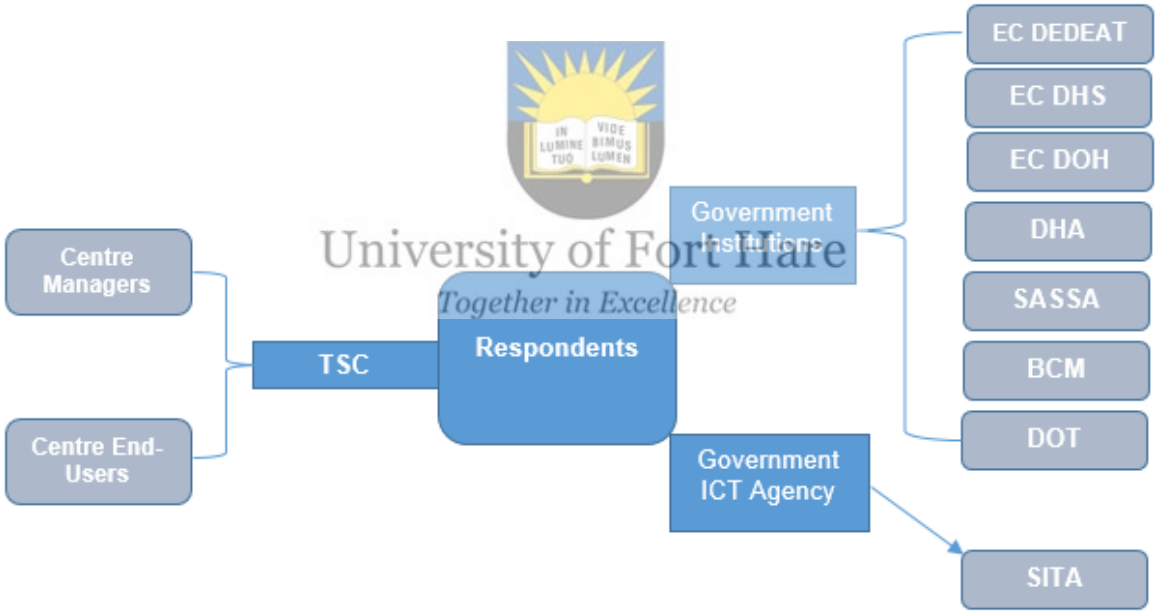


Figure 26: Research Respondents for this Study

5.6.4. Analysis of Interview Questions

Interview questions were structured for each set of respondents according to the TOE framework that includes Technology, Organisation and Environment contexts as shown in Table 23. The Interview Guide and Questions are included as Appendix B for reference.

Table 23: Analysis of Interview Questions

Context	SITA	CIOs / Senior Managers	Centre Managers	End-users
Technology	• Is there an e-government strategy adopted by the government in South Africa? • What are the key focus areas of the e-government strategy? • Is the e-government strategy aligned with the National Development Plan as envisaged by Vision 2030? • How far is the implementation process for the e-government strategy? • Can you briefly identify e-government projects that are currently in operation across government?	• Is e-government part of your strategic plan? • Is there a clear vision of the strategic plan towards e-government? • How matured is your ICT Infrastructure for the support of the implementation of e-government?	• Is there enough ICT infrastructure in the centre to perform daily operations? • How secure is the equipment at the centre? • Is there any noticeable improvement in the delivery of services to the communities?	• How easily accessible are the government services at the centre? • How secure is the centre for the use by the community? • How far is the centre from the community households? • What do you think is needed by the community for improving the delivery of government services by the centre? • Are there any noticeable changes in the delivery of services by the centre?

Organisation	• Who are the key stakeholders that are partnering with SITA in the implementation process? • Are public sector entities willing to accept the change through e-government implementation? • Are there any challenges or barriers that are being experienced by SITA in the implementation process? • Are public sector entities willing to accept the change through e-government implementation?	• Is your departmental Top management aware of the significance of e-government? • Is there any budget allocated to your Department for the implementation of e-government? • What are the key barriers and challenges regarding the implementation of e-government? • Are there any awareness sessions within your Department regarding e-government? • Is the ICT organisation structure resourced enough to support e-government? • What is the qualification level of your ICT staff responsible for e-government in your department?	• How was e-government introduced in the centre? • Was there any training provided by the participating departments on e-government for the centre? • Is there an easy sharing of information between participating departments for the benefit of the community? • How technical is your staff regarding ICT in case of operational failures? • What are the key challenges experienced by the centre regarding ICT? • What do you think is needed by the centre to be effectively operational?	• How the centre was introduced to the community? • Are there any awareness sessions between the participating departments and the community within the centre?

Environment	• Is there any political leadership influence in the implementation process?	• What do you think is needed by the public sector organisations to successfully implement e-government?	• Was the centre promoted or marketed across the community?	• How effective is the centre towards the delivery of services? Please explain • Is the centre accessible to everyone (i.e. elderly, uneducated, etc)? Please explain? • What are the challenges that are experienced by the community within the centre?

5.7. PRELIMINARY FINDINGS

The objective of a preliminary study is to collect information before conducting full research. The preliminary study is extremely critical in that it provides the researcher with valuable and satisfactory information in identifying the research problem. It also assists in what is expected from the data collected. The preliminary study interview process was conducted with the Director: ICT at the Eastern Cape Department of Public Works (ECDPW) and a Business Analyst responsible for e-government projects at the Office of the Premier (OTP).

These interviews were conducted to identify challenges impacting e-government implementation and how these can be mitigated to achieve service delivery in the Eastern Cape. The main questions that were asked include (a) *Is your departmental Top management aware of the significance of e-government?* (b) *Is e-government part of your strategic plan?* (c) *How matured is your ICT Infrastructure for the support of the implementation of e-government?* (d) *Is there any budget allocated to your Department for the implementation of e-government?* (e) *What are the key barriers and challenges regarding the implementation of e-government?* (f) *Is the ICT organisation structure resourced enough to support e-government?* (g) *What do you think is needed by the public sector organisations to successfully implement e-government?*

The responses from the two interviewees showed that the Eastern Cape government leadership is aware of the importance of e-government. As an example, the Director from ECDPW specified that *''Yes, the departmental Top Management is aware of the significance of e-government. Currently, regional offices are utilising the e-memo, for electronic development of a government memo, which assists in cutting down cost and travelling".* The Director of ECPDW also added that *"Though there is a bit of resistance from some management quarters, there is always a mention of e-government initiatives. Currently, the recently revised strategy document is focusing on utilising e-services portal, currently used by SITA".*

The Business Analyst also agreed by stating that the e-recruitment system for electronic management of the recruitment process in government is currently being implemented across the Provincial departments and it is being spearheaded by the Office of the Premier. Both the ECDPW and OTP have e-government initiative as part of their strategic plans but with a limited budget.

The interviewees both specified the challenge of ICT infrastructure especially in the rural areas, the Director emphasises that *"ICT infrastructure is the one that limits the department. Regional offices end up using 3G to improve internet access".* The Business Analyst stated that the much-awaited Broadband implementation in the Province can be a game-changer in the e-government initiative.

The ECPDW Director identified certain challenges that affect the successful implementation of e-government and include (1) buy-in from top management, (2) costs regarding e-government projects and (3) change management processes in implementing technology innovation projects. The Business Analyst agreed with the Director but also added policy restrictions by the government regarding public cloud environment. In South Africa, most organisations are implementing private cloud models rather than the public cloud due to data governance and security fears (Research Africa, 2016).

The organisation structures that support the implementation of e-government are inadequate as more online systems are being implemented. The Business Analyst also emphasised that the Province should invest in re-skilling of its employees in supporting the implementation of e-government.

Finally, answering the last question on what should be done to successfully implement e-government, the ECPDW Director said, "*There should be services that are shared across departments, to cut costs. Paying for licenses on per user basis, might not be sustainable for*

departments, due to expenses involved. Ownership of the solution must belong to government".

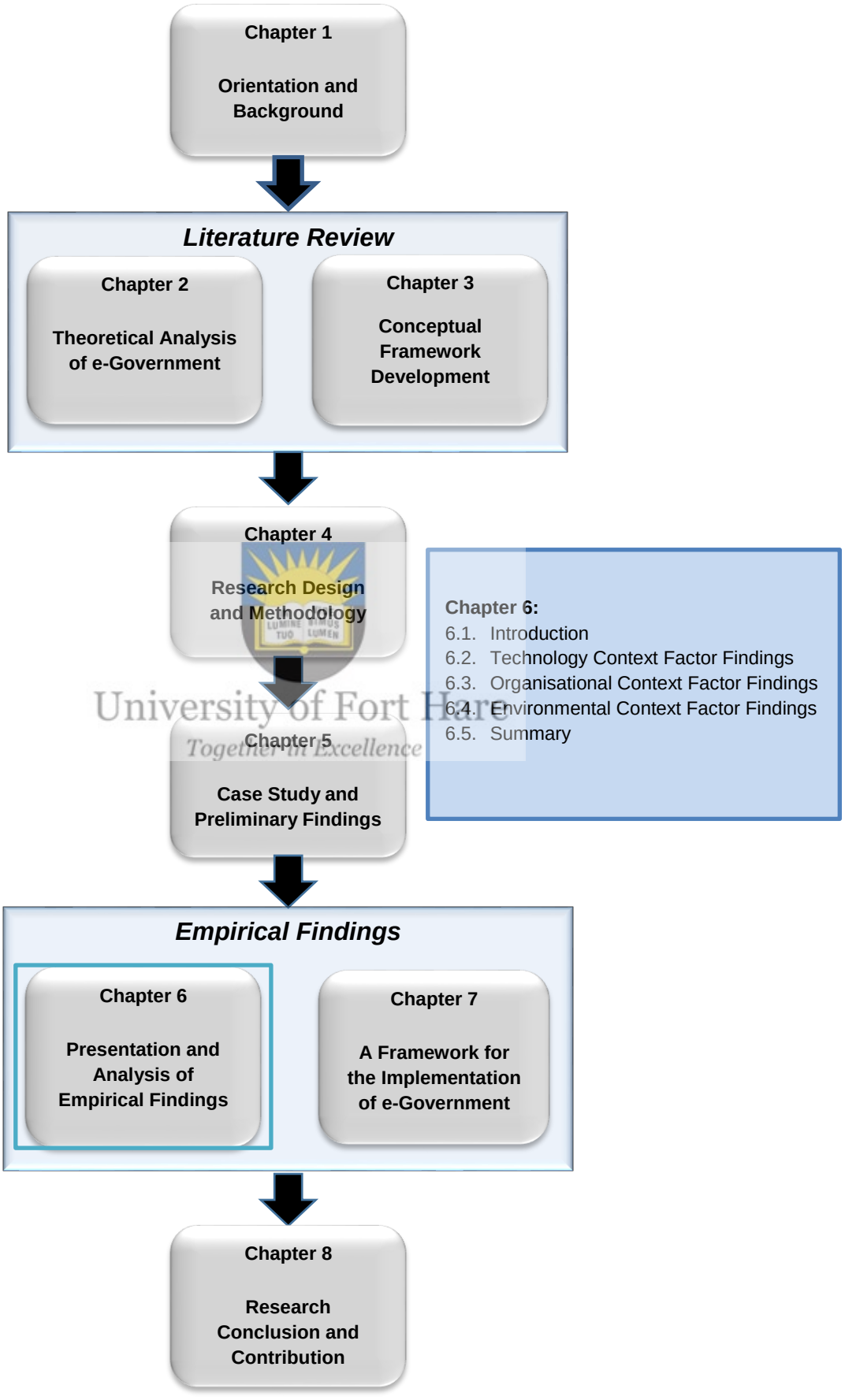
In conclusion, based on the interviewees' answers it is evident that a successful implementation of e-government in the Eastern Cape will rely mainly on the buy-in from government leadership, policy changes, scalable ICT infrastructure, sustainable budget, adequate human resources to support the initiative and clear change management processes. This implementation process will necessitate a clear acknowledgement of political, social, economic and technical challenges from the provincial government entities as envisaged by the underlying Technology Organisation Environment (TOE) framework. Therefore, selecting SITA as an ICT agency of Government, The CIOs / Senior Managers from Departments participating in e-government and the Centre Managers from various Thusong Service Centres was vital in trying to address the research question, "*What are challenges impacting e-government implementation for Thusong Service Centre and how can these be mitigated to achieve service delivery?"*

5.8. SUMMARY

This chapter focused on the socio-economic overview of the Eastern Cape. The socio-economic overview assisted the researcher in getting a clear insight into the challenges that are being faced by the selected Thusong Service Centres. This chapter also provided detailed profiling of the Thusong Service Centres which also included the objectives and guiding principles of these centres.

The objective of the chapter of detailing the socio-economic situation of the problem area was achieved and enabling the researcher to fully understand the challenges and barriers that affect these Thusong Service Centres. Furthermore, the findings of the preliminary study were analysed and presented as a guide on what is expected from the collection of data and identification of key challenges affecting the implementation of e-government in the Thusong Service Centres. The problem area of the Thusong Service Centres as a case study assisted with empirical data that was analysed in the next chapter 7 and tested with the Conceptual framework developed in Chapter 3 (section 3.6). The empirical data from the Thusong Service Centres also revealed factors that affect the implementation of e-government through these Centres and contributed towards the holistic e-government implementation framework. The analysis of data is then presented in the next chapter.

CHAPTER 6 – PRESENTATION AND ANALYSIS OF EMPIRICAL FINDINGS



6.1. INTRODUCTION

The previous chapter explained in detail the case study of the Thusong Service Centres in the Eastern Cape. The case study chapter was critical in explaining the uniqueness of the research area being investigated. The analysis of the empirical data from the Thusong Service Centres as the problem area revealed factors that affect the implementation of e-government through these Centres and contribute towards the holistic e-government implementation framework.

This chapter was based on the analysis of data as collected through the qualitative approach by directly interacting with the responsible respondents who are familiar with the research problem (Denzin and Lincoln, 2005; Merriam, 2002). The data analysis process is an essential procedure for reliable and trustworthy qualitative research. It is based on the interpretation of practices and insights of individuals in revealing a particular context (Maguire and Delahunt, 2017).

The analysis of data was based on the respondent's responses from the interviews and this is coded as per individual response. All the selected respondents were able to respond through a face-to-face interview, e-mail correspondence or telephone interview. The interview questions were e-mailed to all the respondents before the actual interview for ease in understanding. This included the ethical consent forms as guided by the UFH Ethical Clearance Approval document.

The chapter begins with sections 6.2, 6.3 and 6.4 focusing on the analysis of the Technology Organisation Environment (TOE) framework three contexts as represented by the critical factors that impact the implementation of e-government in South Africa. Section 6.5 summarises the chapter.

The next sections present a detailed analysis of the critical factors that impact on e-government implementation as perceived through the underlying theory of TOE. This data was collected from the set of four groups of respondents (Resp1, Resp2,.., Resp19).

6.2. TECHNOLOGY CONTEXT FACTOR FINDINGS

The e-government implementation is based on the collaborative use of the internet and related systems in conducting business with the government for the benefit of citizens (West, 2004; UN Report, 2004; Kunstelj and Vintar, 2004). The technological context of the TOE framework is therefore critical for e-government implementation in South Africa. This section, therefore, defines in detail the technological factors in the implementation of e-government as described by the respondents. The two areas of focus are the ICT Strategy and ICT Infrastructure.

6.2.1 ICT Strategy

The development of e-government strategy was performed through desktop research by the then Department of Telecommunications and Postal Services (DTPS) which has since been renamed in 2019 to Department of Communications and Digital Technologies (DCDT). The National e-government strategy and roadmap is a five-year plan document that has been endorsed by parliament in South Africa. Its purpose is the digital transformation of public service in the country.

The e-government strategy is critical in that it defines a renewed approach and programme of action that is intended to radically improve government systems in South Africa. The strategy is also not a replacement of the existing e-government policy and framework but a programme to assist SITA as the e-government implementation agency to create an enabling ICT environment for government departments in providing electronic services to citizens. This is also highlighted by the SITA Executive responsible for Hosting and Secure Operations (Resp1) when he responded as follows:

"*Yes, the National e-Government Strategy was approved by Cabinet. The Department of Telecommunications and Postal Services (DTPS) which is now the new Department of Communications and Digital Technologies (DCDT) is the custodian of the National e-Government Strategy. The State Information Technology Agency (SITA) is the technical implementer of the National e-Government Strategy*."

However, there is no consolidated approach in implementing the strategy as departments are rolling out their e-government initiatives in silos. This also confirmed by the SITA Provincial Head in the Eastern Cape (Resp2) when he responded as:

"*Yes, there is an e-government National Strategy. However, these are disparate, most departments are doing this in isolation. It is not a consolidated approach for government in totality*."

The Group CIO from Department of Transport (Resp9) also strongly feels that one of the critical barriers of e-government implementation is based on lack of common vision between departments and SITA, leading to silo-based developments around the e-Transport system.

The importance of e-government in the South African public sector is clearly shown by the responses of all the ICT Senior Managers (Resp2 to Resp9) from various government departments who responded that e-government is part of their ICT strategies. As an example, the Chief Director from the Department of Home Affairs (Resp6) when asked the question, *"is e-government part of your strategic plan?"* said *"Yes. The development, deployment and*

support and maintenance of existing and new Modernised systems form part of the Strategic Plan, MTEF Plan, APP and Ops Plan." Furthermore, the Group CIO from the National Department of Transport (Resp9) said "*Yes, e-Transport is our overall e-government strategic initiative as part of the Strategic Plan for the 6th term of government.* Moreover, the SASSA CIO (Resp7) has this to say, *"Yes, e-government initiative is part of the broader SASSA Strategic Plan for the next 5 years".*

The e-Government Strategy is also responding to the National Development Plan (NDP) Vision 2030. The ultimate objective of e-Government is to establish an e-Government Portal (www.eservices.gov.za) that serves as a single-point-of-entry for the consumption of Government's electronic services (e-Services). The SITA Executive (Resp1) explained:

"*As part of its scope, the e-Government Strategy is focusing on the following three (3) key imperatives:*

1) *Business Service Digitalisation*
2) *Data Integration, Data Analytics, and Business Intelligence*
3) *Open platform providing a framework of services"*

The South African government has at least achieved to implement the e-services portal as an entry point for all government online services. This has been provided by SITA as explained by the SITA Executive (Resp1):

"*The e-Government Strategy is implemented as a multi-year programme. Over the past three (3) years, more than seventy (70) electronic services (e-Services) have been made available for consumption by citizens using the e-Government Portal (www.eservices.gov.za). The e-Government Strategy will extend to converge with the Digital Transformation and the Fourth Industrial Revolution journeys of the Public Service."*

The online services offered have been confirmed by the community users of all the Thusong Service Centres as explained by the Cofimvaba TSC user (Resp18):

"The services are accessible online through the computer centre with 10 computers"

There is also a limited understanding of the e-government vision by government departments' leadership as it relates to the strategic plan. This is shown by the response from the Senior ICT Managers from both the national and provincial government departments. Only 28% responded positively about their top Management in understanding the vision of the strategic plan as relates to e-government. For example, the Chief Director from the Department of Home Affairs (Resp6) when asked, "*Is there a clear vision of the strategic plan towards e-government?* He responded as follows, "*Yes. The new Home Affairs is being repositioned on*

e-Government". Whereas the Group CIO from the Department of Transport (Resp9) responded by saying, "*No, the vision for e-Transport is not clearly understood by the business."* The Senior Manager for ICT at DEDEAT *(Resp3)* has this to say*, "We do not have a clear e-government vision, needless to say, e-government is embedded in the ICT strategy."* This statement was also supported by the Senior Manager from Department of Human Settlements (Resp4) when she said, *"The Department's leadership has no vision about e-government but e-government initiatives are conducted in a silo way within the department.*

Finally, SITA established a separate portfolio within their structures which is to overlook the ICT security in government. This unit is solely responsible for securing the information and data governance within government departments as all departments are using the SITA connectivity network that is legislated through SITA Act of 1988. However, the responses from the Centre Managers and Centre End Users have a negative implication around security in these centres, both physically and logically. All of them when prioritising what is needed to improve operations in the centres pinpointed to the physical and logical security as priority number 1. The summarised key findings within the ICT strategy factor are presented in the next sub-section:

These are a summary of the major findings based on the ICT Strategy factor:

1) The South Africa Government has endorsed a National e-government strategy and roadmap.
2) The Department of Communications and Digital Technology (DCDT) is the custodian of the e-government strategy. SITA is the main implementer for the government.
3) An e-services portal has been implemented by SITA as a single-point-of-entry for access to more than 70 online government services. This includes initiatives like e-Matric, e-Participation, e-Recruitment and e-NaTIS. This portal will also be enhanced to cater for the fourth Industrial revolution emerging technologies.
4) There is a silo implementation of e-government initiatives across government departments.
5) There is no public participation in the development of the National e-Government Strategy as this is conducted through desktop research.
6) The e-Government strategy vision is not easily understandable.
7) Lack of logical and physical security across all centres selected for the research.

6.2.2 ICT Infrastructure

The ICT infrastructure is a critical factor of the Technology context as it lays the foundation of the e-government initiative. The ICT infrastructure factor includes the availability of Broadband

ecosystem as the underlying connectivity factor and the use of data and information in developing application systems. The Provincial Administration has embarked on a 10-year Broadband project for the connection of approximately 8000 sites in the Eastern Cape. This includes schools, hospitals and government institutions.

According to the Provincial ICT Strategy (2019 -2024), the ICT Infrastructure support structure in the Province, however, has not been adjusted to cope with the increasing demand. The rapid growth in the ICT ecosystem was mainly caused by computerised business processes, which results in an ever-increasing dependency on these technologies for the rendering of services. ICT has moved from being merely a convenient way of online services to a mission-critical strategic service.

We can think of availability as being the total amount of bandwidth available for international connectivity as well as the size of the available backbone fibre capacity within the country. Broadband penetration is the accessibility of broadband capacity to end-users. The Broadband services lag considerably behind penetration because services require a critical mass of users to be economical.

Currently, as an example, the Travelling and Subsistence budget for the Province has reached staggering heights due to travelling by government employees for access to ICT connectivity. The Director for ICT at the Department of Human Settlement (Resp4) has this to say:

"The departmental ICT infrastructure is predominantly obsolete and it makes it difficult to support the implementation of e-government. Thus, the current capacity of the department's ICT Infrastructure is unreliable to meet the current and future demands of the department in delivering integrated and sustainable human settlement."

The Senior Manager of ICT at DEDEAT (Resp3) also explain this challenge:

"Internet Access is the barrier, as a result, the department uses the current SITA internet, which is very slow at times, to improve access additional APNs have been provided which are based on Vodacom network through the Vodacom contract." He further narrated that*, "Due to various reason the department does not use its infrastructure to host e-government services due to lack of capacity, the department has partnered with SITA in the implementation of e-governments services through a portal called e-services.gov.za. The only infrastructure from the department are devices to connect to the internet."*

On the maturity of ICT Infrastructure, the Chief Director from the Department of Home Affairs (Resp6) responded by saying, *"Not well matured. This stems not so much from technology, but the availability of appropriately skilled personnel including the appropriate working*

conditions. We should be a 24 hour, 7 days per week, 365 days per year organisation, but our office hours are limited to 08:00 to 16:00 Monday to Friday. We have clients who engage us from different time zones at different foreign missions, but our structure is not geared towards this reality."

The Group CIO from the Department of Transport (Resp9) said, *"Our infrastructure is ready to support e-government through consolidation under the department private cloud infrastructure."* Also, the BCM Head of ICT (Resp8) acknowledged the maturity of ICT infrastructure by saying, *"Our ICT infrastructure is very matured and utilising the new cloud technology".* However, the CIO from the Department of Health (Resp5) had a different view as she says, *"Our infrastructure is very old and obsolete and it needs a refresh to support e-government projects."* Whereas the SASSA CIO (Resp7) confirmed that SASSA ICT Infrastructure is semi-matured.

The Provincial ICT Strategy 2019 – 2024 is also very emphatic on the use of data in government institutions as it can be seen from strategic objective number 3 which states that "***Data as an Enabler"*** which is expanded as follows:

"In line with legislative obligations and Data Protection guidelines, facilitate increased data sharing and innovative use of data across all Provincial Government institutions to enable the delivery of integrated services, improve decision making and improve openness and transparency between government and the public."

The underlying principle for this strategy also highlights the importance of data and information by stating that, *"To enable data sharing, the government must develop and abide by a common set of policies, procedures, and standards governing data management. The government will require a significant culture change to share data."*

The respondents' information is totally in contrast with the above strategic objective because almost 100% of the Centre Managers and the Centre End Users believe that there is no sharing of data and information between the participating departments in these centres. This is also confirmed by the SITA Executive Head (Resp1) when he replied as follows:

"There is a lack of will for government departments to share data across the government to enable Data Integration and Government-wide Data Analytics."

One of the strategic objectives for the Provincial ICT Strategy (2019 – 2024) is focusing on ***"Digital First"***. This is based on the transformation of applications and systems to digital format so as use ICT to deliver services efficiently to citizens, business and public servants. The underlying principle of the strategy further emphasises this strategic objective,

"Development of applications supporting that work across government and those that support the 12 Outcomes is preferred over those supporting a particular department or over a similar or applications that already exist within government."

The SITA Executive Head (Resp1) summarises the issue of non-sharing of applications by explaining that, *"Some misalignments across the Public Service when it comes to digitalisation and delivery priorities. This also impacts on the availability of budget from the various departments to pay for the e-Services delivered."* The SITA Executive Head (Resp1) also suggested the following, *"The establishment of the Government Data Governance Office for improved data governance."*

The key findings for the ICT Infrastructure factors are summarised as follows:

1) Obsolete ICT infrastructure including lack of internet access.
2) Silo implementation of systems with no compatibility and interoperability.
3) Implementation of www.e-services.co.za as a one-stop-shop for Government services.
4) No data and information sharing

The major findings from the technological context factors have been summarised as shown in Table 24:

Table 11: Major Findings for the Technological Context Factors

Technological Factor	Factors	Major Findings
ICT Strategy	Vision Interoperability ICT Security Economies of Scale Eliminate Duplication Indigenous Languages Digital Inclusion	• The South Africa Government has endorsed a National e-government strategy and roadmap. • The Department of Communications and Digital Technology (DCDT) is the custodian of the e-government strategy. SITA is the main implementer for the government. • An e-services portal has been implemented by SITA as a single-point-of-entry for access to more than 70 online government services. This includes initiatives like e-Matric, e-Participation, e-Recruitment and e-NaTIS. This portal will also be

		enhanced to cater for the fourth Industrial revolution emerging technologies. • There is a silo implementation of e-government initiatives across government departments. • There is no public participation in the development of the National e-Government Strategy as this is conducted through desktop research. • The e-Government strategy vision is not easily understandable. • Lack of logical and physical security across all centres selected for the research.
ICT Infrastructure	Broadband Data and Information Applications Systems	• Obsolete ICT infrastructure including lack of internet access. • Silo implementation of systems with no compatibility and interoperability. • Implementation of www.e-services.co.za as a one-stop-shop for Government services. • No data or information sharing

The next section clarified various features that relate to the organisational contexts and have been recognised as key factors of e-government implementation. These include the organisational culture, senior leadership, collaboration, financial resources and resistance to change.

6.3 ORGANISATIONAL FACTOR FINDINGS

This organisational context analysis is guided by the literature review conducted in chapter 2 and 3 and all the respondents agreed on the importance of the organisation-related matters that affect the implementation of e-government. The next sub-sections will detail these factors as represented by the organisational culture, senior leadership, collaboration, financial resources and resistance to change.

6.3.1 Organisational Culture Factor

There are significant differences between the public sector and private organisations when implementing e-government in terms of standards, skills required, structures and processes. This is evident in the responses provided by the CIOs when asked about the processes and structures in conducting the awareness around e-government implementation. The Chief Director from the Department of Home Affairs (Resp6) responded as follows:

"Yes. We have a Learning Academy within the Department that is responsible for training on DHA internal IT systems. This is also done in partnership with Human Resource Management and Development's Change Management unit."

The Senior Manager from DEDEAT (Resp3) said, *"Training is conducted during the implementation of the e-government services to the internal users of the department, roadshows are then conducted to cater for the general public who are to utilise the services to get services from the department."*

The head of Buffalo City Metro (Resp8) confirmed that e-government awareness is only done through the MSCOA Steering Committee. The rest of the CIOs have confirmed that there is no training given to the end-users around e-government but only user manuals that are distributed to the system users based on the individual applications. This is a major hindrance in the implementation of e-government as confirmed by the CIO from health (Resp5).

Responses from the Thusong Service Centre managers showed a different view on the processes of introducing e-government to these centres as this was conducted through the Imbizo Community sessions by the GCIS department in collaboration with USAASA who is responsible for the ICT infrastructure deployment.

The required skills for the implementation of e-government came out strongly from the respondents as noted by the SITA Executive (Resp1) when he said, "*The limited skills in the areas such as Software Development, Data Science, Machine Learning, Artificial Intelligence, Internet of Things, and Robotics is a critical challenge that related to e-government implementation.* Almost all CIOs have identified a shortage of skills as an issue that impacts the implementation of e-government in the public sector. Only the Group CIO from the Department of Transport (Resp9) who said, *"The departmental ICT structure consists of almost 40 ICT specialist and can be supplemented by more than 300 personnel that is managing and running e-NaTIS. The structure is well resourced to support e-government."*

The CIO from the Department of Health (Resp5) also raised a very important issue of ICT practitioners who are leaving the province and pursuing their IT careers in other provinces like

Gauteng and the Western Cape. Her response, when asked about challenges affecting e-government implementation, was, "*Funding availability, human resources (IT Skill relocating to other Provinces)"*

The Centre Managers and Centre End-Users confirmed that the training on the use of these e-government initiatives in the Centres is mainly conducted by the participating individual departments. These pieces of training are also not regular and are only conducted in English impacting on the illiterate. They also responded that most of the Thusong Service Centres have Centre Managers employed on an acting basis which impacts the day-to-day operations of these centres. This recruitment delay is mainly caused by the bureaucratic processes within government systems.

The summarised findings for the organisational factor are:

1) Lack of standards, structures and processes in promoting e-government.
2) Lack of skills to support e-government initiatives including the current emerging 4IR technologies.
3) The public sector is a bureaucratic system.
4) Brain drain – a scenario where IT skilled resources are opting for higher-paying jobs in other provinces.
5) Establishment of a central Government Data Office for improved Data Governance.

6.3.2 Senior Leadership

The implementation of e-government relies most on the support of the organisation's top leadership. This is due to the bureaucratic nature of the public sector in South Africa where the decision-making process flows from the top management to the lower levels of the organisation. Altameem (2007) also defines senior leadership in an organisation as a group of leaders who control the processes and functions of the whole entity at the top level.

The CIOs were initially asked the following question, *"Is your departmental Top management aware of the significance of e-government?".* The response was incredibly positive from most of the CIOs and the Chief Director from the Department of Home Affairs (Resp6) responded as follows:

"Yes. Inspired by SARS' successes, the Department has been running the Modernisation Programme since 2013 and supported by the leadership of the department."

The Senior Manager for ICT from DEDEAT (Resp3) responded as follows, *"they are aware, the awareness is based on the solutions that we have implemented which are e-government*

related, however, we have not done a deliberate attempt to make them aware of e-government as a concept, needless to say, the solution that they use which we have implemented are e-government related solutions."

The Senior Manager for ICT from DHS (Resp4) also added her response by saying, *"The executive management of public sector organisation must be the ambassadors of e-government because the change can only start at this level and e-government initiatives must be fully supported."*

The summarised key findings for the Senior Leadership Factor are

1) Strategic skill to take decisions
2) E-government awareness.
3) Senior Leadership must be ambassadors of e-government

6.3.3 Collaboration

The respondents raised the issue on non-sharing of information between government departments especially the participating departments in the Thusong Service Centres. This issue is emphasised by all Centre Managers when they responded as follows, *"all the participating departments are working silos. No system links the departments."*

For example, the SITA executive (Resp1) had the following suggestions when asked about the critical steps that must be undertaken before the implementation of e-government,(1) "*The establishment of the Inter-Ministerial Committee that reports to the President of the Republic. (2) The establishment of the Government Data Governance Office for improved data governance. (3) The encouraging collaboration amongst the role players in the Digital Transformation for encouraging open innovation, cross-pollination, and further skills development.*

The SITA Provincial Head (Resp2) also suggested the following, "*consolidate the strategy to be driven from one central point".* Furthermore, the Chief Director from the Department of Home Affairs (Resp6) advised that "*We must operate as one government, at least in each sphere. At a bare minimum, for example at the national level, clusters should centralise IT to optimise human resources as there is already data sharing within-cluster departments."* Moreover, the SASSA CIO (Resp7) also said, "*Sharing of resources and infrastructure. Co-ordinated planning and design. Standardization and compliance with security guidelines."*

This view is also supported by the Group CIO from the Department of Transport (R9) in *saying "The e-government would succeed if the government can have an ICT strategy with a*

dedicated e-government chapter. That strategy should appoint respective departments to coordinate e-government in their respective sectors (e.g. e-Transport. eHealth, e-Agriculture etc). The strategy should be supported by an implementation plan to force various departments to conduct proper planning and budgeting."

In response to the challenge of non-collaboration of government departments, the SITA Executive (R1) also mentioned key stakeholders that SITA is partnering with, in the implementation of e-government by explaining that, "*The e-Government journey is a multi-stakeholder and multi-sectoral journey that involves various organs of state, private sector, academia, research institutes, civil society, non-government organisations (NGOs), and non-profit-making organisations (NPOs)."*

Finally, the Head of ICT from the Buffalo City Metro (Resp8) is suggesting a holistic Business Process reengineering (BPR) of the entire e-government model by responding as follows, "*Redesign the viability of the system in place, to model an effective e-government model. By looking at the interoperability at the coordination level to compliance and environment."*

The summarised key findings for Collaboration Factor based on the respondents are:

1) Information Sharing between government entities
2) Business Process Reengineering as a process of reorganizing public entities
3) Inter-Ministerial Committee to be responsible for the governance of e-government
4) Stakeholder Management is key to collaboration between public entities.

6.3.4 Financial Resources

All the respondents agreed concerning the impact of finance in the implementation of e-government. Starting from the SITA Executive (Resp1) response it is noticeably clear that the e-government implementation relies more on the financial support provided by the government. When asked about the challenges and barriers of e-government implementation, he responded as follows, *"(1) some misalignments across the Public Service when it comes to digitalisation and delivery priorities. This also impacts on the availability of budget from the various departments to pay for the e-Services delivered. (2) The lack of funding and investment to encourage innovation in the e-Government and Digital Transformation Horizon."*

There were mixed responses from the CIOs around the issue of the budget allocation for e-government, for example, when asked, *"is there any budget allocated to your Department for the implementation of e-government?"*, the Chief Director for ICT at Department of Home Affairs (Resp6) said, "*yes. In addition to the Operational Budget, we also have a ring-fenced budget that is monitored by the National Treasury."* This was supported by the Senior Manager

for ICT at DEDEAT (R3) when he responded as follows, ***"****There is the budget allocated for e-government initiatives, such as the consumer call centre, the e-Permit system and the Agro-processing system. This budget sits in the respective programs and as ICT we access this budget from those programs and assist them to implement the solutions. ICT have their budget to cover the general support the ICT provides to the entire department."*

However, both the CIO from Health (Resp5) and the Senior Manager for ICT at the Department of Human Settlements (Resp4) complained of a minimal budget that is only sufficient to fulfil contractual obligations with SITA. The Group CIO from the Department of Transport (Resp9) said, "*There is no separate special budget allocate for e-Transport. Elements of e-Transport like e-NaTIS are self-funding through a levy on vehicle licensing."*

Summarised key Findings for Financial Resources Factor based on the respondents:

1) Cost implications in the e-government implementation

6.3.5 Resistance to Change

E-government implementation introduces new processes and procedures for the provisioning of services to the citizens. The two SITA (Resp1, Resp2) personnel were asked the question, *"are public sector entities willing to accept the change through e-government implementation?*". This was done to understand the feeling around the reluctance and resistance to change from the government departments. The SITA Executive (Resp1) responded as follows, "*although there is some resistance to change, the value offered by the e-Services that are currently in the e-Government Portal creates more appetite for other organs of state to be on-board. The political enforcement and political will from the President of the Republic advocating for the country's Digital Transformation is also serving as a good Change Management mechanism encouraging more government departments to collaborate."*

Moreover, the end-users that are utilising the Thusong Services Centres were comfortable in utilising the online services provided by the participating departments. As an example, the response from the Centane Thusong Service Centre End-User is, *"the online services provided by the participating departments have significantly changed the lives of the community."*

Summarised key Findings based on the respondents for Resistance to Change

1) There is some form of resistance to change

2) There is also a political will from the President advocating for the country's digital transformation in government.

The major findings from the respondents for the Organisational context factors are summarised as shown in Table 25 below:

Table 12: Major Findings for the Organisational Context Factors

Organisational Factor	Factors	Major Findings
Organisational Culture	Standards Structures and Processes Skills	• Lack of standards, structures and processes in promoting e-government. • Lack of skills to support e-government initiatives including the current emerging 4IR technologies. • Public sector bureaucratic system. • Brain drain – a scenario where IT skilled resources are opting for higher-paying jobs in other provinces. • Establishment of a central Government Data Office for improved Data Governance.
Senior Leadership	Strategic Skills	• Strategic skill to take decisions • E-government awareness. • Senior Leadership must be ambassadors of e-government
Collaboration	Information Sharing	• Information Sharing • Business Process Reengineering • Inter-Ministerial Committee

		• Stakeholder Management
Financial Resources	Costs	• Cost implications in the e-government implementation
Resistance to Change	Unfreeze Change Refreeze	• There is some form of resistance to change • There is also a political will from the President advocating for the country's digital transformation in government.

6.4 ENVIRONMENTAL CONTEXT FACTORS FINDINGS

The examination of the influence of environmental context factors for the implementation of e-government in the TOE studies has been performed previously (Kuan and Chau, 2001; Zhu et al., 2004). These studies revealed factors such as political, economic, regulatory and cultural. The following sub-sections explored these factors based on the respondents of the case study.

6.4.1 Political

The South African political change from the previous apartheid regime to the current democratic government has been the most significant political achievement gain by the country. The African National Congress (ANC) has been at the forefront and leading the policy development and implementation. The most competitive elections were in 2016 for local government in which the ANC was defeated by the opposition parties in ruling the major metropolitan municipalities. This led to coalition deals that saw the shared leadership in Nelson Mandela Bay, Johannesburg and Tshwane Metro Municipalities.

South Africa also has made substantial steps in improving people lives since the dawn of democracy but the gap between the rich and the poor is still very wide. So, all the realities that made the country succeed in its transition process are still in place and secure future stability. This political change in South Africa has been accompanied by the transformation of the public sector through various policies like e-government policy.

This political stability and change through public sector transformation are also confirmed by the SITA Executive (Resp1) when asked if there is any political leadership influence in the e-government implementation process. He responded as follows, "*yes, there is a conceived idea*

of the Inter-Ministerial Committee that has to provide oversight on the governance and implementation of the National e-Government Strategy. The involvement of the President of the Republic in the context of the Digital Transformation and the Fourth Industrial Revolution (4IR) journeys is also helping with influencing the implementation. The political enforcement and political will from the President of the Republic advocating for the country's Digital Transformation is also serving as a good Change Management mechanism encouraging more government departments to collaborate."

Moreover, the president of the Republic also appointed a Presidential Commission on the Fourth Industrial Revolution which will assist the government in taking advantage of the opportunities presented by the digital industrial revolution. The task of the Commission, which will be chaired by the President, is to identify relevant policies, strategies and action plans that will position South Africa as a competitive global player.

The Minister of Department of Communications and Digital Technologies, Ms Stella Ndabeni-Abrahams has also been nominated as the coordinator of government 4IR programme.

The summarised key findings for the Political Factor based on the respondents are:

1) There is political stability in the Country which is conducive for e-government implementation.
2) There is also political support from the executive of the country.
3) The Presidential Commission on Fourth Industrial Revolution has been set up and chaired by the President of the country.

6.4.2 Economical

One of the priorities for improving ICT industry in South Africa is through sustainable investment in the sector. This can be done through the attraction of both the local and foreign investment. The ICT sector in South Africa encompasses areas such as Information Technology, Telecommunications, Postal Services, Broadcasting and Postal Services. The SITA executive (R1) also noted this issue of ICT investment when asked about challenges and barriers that impact on e-government implementation. He responded as follows, "*The lack of funding and investment to encourage innovation in the e-Government and Digital Transformation Horizon.".* The CIO from the Department of Health (Resp5) also supported this investment drive when she responded, "*Funding needs to be provided and those funds ring-fenced for future investment and support initiatives like e-government."*

The summarised key findings for the Economic Factor are:

1) ICT Investment
2) Limited e-government funding

6.4.3 Regulatory

The South African government has legislated the implementation of e-government through various policies and frameworks as discussed in Chapter 3. This includes the e-government policy, the e-government strategy and the national e-strategy. The regulatory mandate has also been confirmed by the SITA executive (Resp1) when he said, "*Yes, the National e-Government Strategy was approved by Cabinet. The Department of Telecommunications and Postal Services (DTPS) which is now the new Department of Communications and Digital Technologies (DCDT) is the custodian of the National e-Government Strategy. The State Information Technology Agency (SITA) is the technical implementer of the National e-Government Strategy."*

The summarised key findings for the Regulatory Factor are:

1) Regulatory Mandate approved by Cabinet
2) Presence of legal frameworks and policies

6.4.4 Cultural

The cultural aspect of the implementation of e-government entails social factors like language, religion, education age, and experience. These areas of social characteristics are extremely critical when introducing e-government in communities. The Centre Managers from the Thusong Service Centres also noted the importance of this cultural aspect because when asked how e-government was introduced in their communities, they agreed that this was done through the Imbizo Community sessions by the GCIS using their language of Xhosa and Sotho.

Moreover, when the Centre users were asked, *"Is the centre accessible to everyone (i.e. elderly, uneducated, etc)?"*, they all responded as follows, *"yes, for example, community meetings and business opportunities are being held at the centre with various communities' members (from the youth to adults – educated and uneducated) members in attendance."*

The summarised key findings for the Cultural Factor are:

1) Usage of Indigenous language
2) The centre must be accessible to everyone irrespective of age, education, religion or sex for the use of online services.

6.4.5 Social

Dourish and Bellotti (1992) recognised the importance of awareness in the implementation of e-government. Therefore, it is critical to raise awareness for e-services deployment (Al-Ghaith, et al., 2010). This is confirmed by the Centre Managers when asked, *"was the centre promoted or marketed across the community?".* They responded that *"yes, this was done through the Imbizo Community sessions that are conducted by GCIS."*

Furthermore, most of the Centre Managers and the Centre End-Users complained about the state of the physical infrastructure of these Thusong Service Centres, as an example, the Vidgesville End-User was asked, *"What do you think is needed by the community for improving the delivery of government services by the centre?",* the answer was, "*The three high priorities for the improvement of the centre are, (1) The transfer of ICT infrastructure back to USAASA, (2) the renovation of the Centre building with secured fencing and stable electricity system (3) the purchase of new computers with the latest software (4) the stabilisation of the internet as the most critical asset of the community."*

This was confirmed by the Cofimvaba End-User (Resp18) on the same question when she responded as follows, *"The computers are incredibly old including the software that has been installed is outdated. The internet is not stable and sometimes it would be down for about 24 hours. Physical security and IT security are both inadequate. The building infrastructure needs some renovation. Electricity is also a big challenge. The office space is not adequate as some of the staff members from the two departments are currently placed in Queenstown which is a few kilometres away."*

Finally, the Centre Users and the corresponding Centre managers were asked, *"Is there any noticeable improvement in the delivery of services to the communities?",* and they answered, for example, a Centane End User said, "*Yes, the online services provided by the participating departments have significantly changed the lives of the community."*

The summarised key findings for the Social Factor based on the respondents are:

1) The importance of awareness concerning e-government
2) Improvement in service delivery challenges.

The major findings from the respondents for the Environmental context factors are summarised as shown in Table 26 below:

Table 13: Major Findings of the Environmental Context

Environmental Factor	Factors	Major Findings
Political	Political Certainty Political Support	• There is political stability in the Country making conducive for e-government implementation. • There is also political support from the executive of the country. • The Presidential Commission on Fourth Industrial Revolution has been set up and chaired by the President of the country.
Economical	ICT Investment	• ICT Investment • Limited e-government funding
Regulatory	Legal Mandate	• Regulatory Mandate approved by Cabinet • Presence of legal frameworks and policies
Cultural	Indigenous Language	• Use of indigenous language • The centre is accessible to everyone irrespective of age, education, religion or sex for the use of online services
Social	Service Delivery	• The importance of awareness concerning e-government

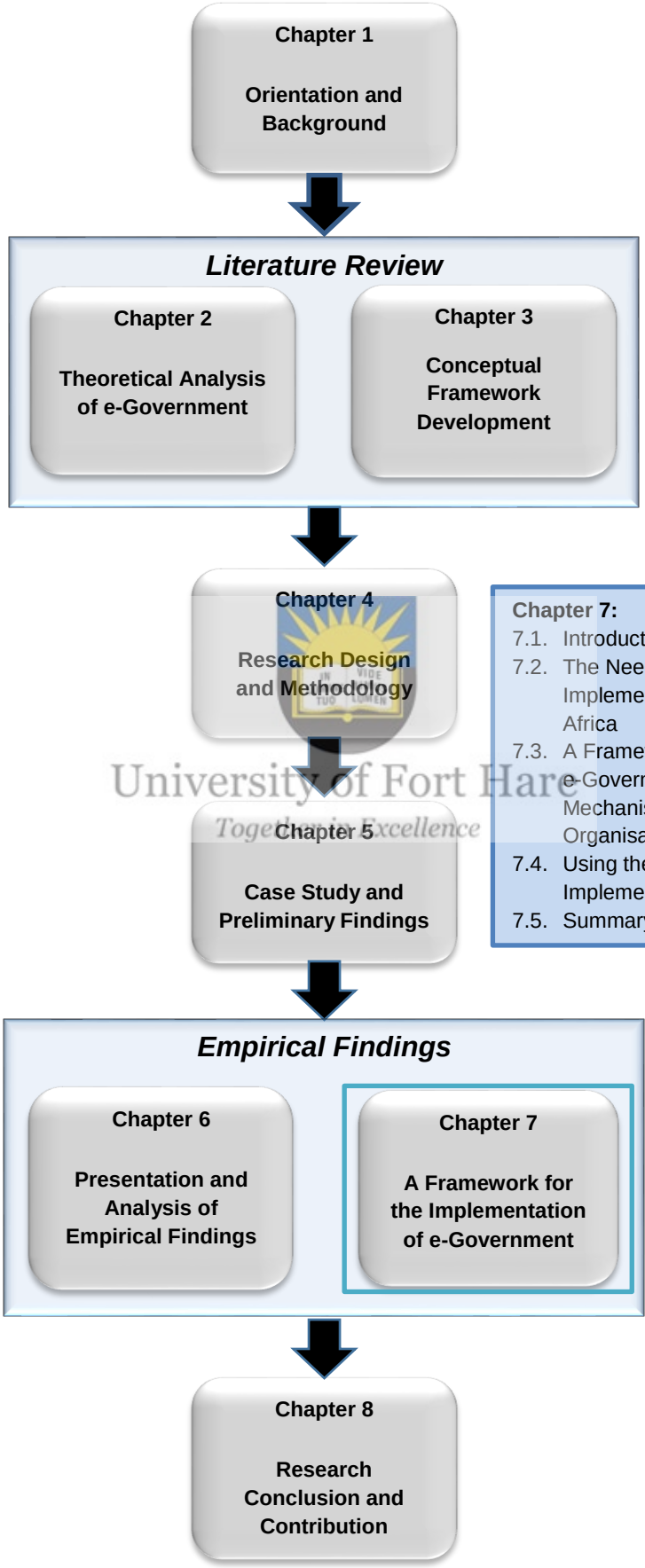
		• Improvement of service delivery challenges • The physical infrastructure of the building is inadequate including the shortage of electricity

6.5 SUMMARY

In this chapter, a content analysis of data based on the interview respondents was conducted. The data was collected from the four sets of respondents, from SITA, CIOs from government departments, Thusong Service Centre Managers and Centre End-Users. The chapter has analysed the data collected and, in the process, identified various factors affecting the implementation of e-government based on the Technology Organisation Environment (TOE) framework. Moreover, the researcher has presented the full discussion of the analysis as guided by the conceptual framework developed in Chapter 3 which will assist in developing a holistic e-government implementation framework.

The next chapter re-examined the conceptual framework developed in chapter 3 based on the research findings to develop a comprehensive e-government implementation framework. In the next chapter, the researcher presented a full discussion of the results and findings outlined in previous chapters to construct a holistic e-government implementation framework that should assist in effective implementation of e-government in South Africa through the Thusong Service Centres. This included the findings from the expert reviews and the resultant adjustments to the implementation framework.

CHAPTER 7 – A FRAMEWORK FOR THE IMPLEMENTATION OF E-GOVERNMENT



Chapter 7:

7.1. Introduction
7.2. The Need for an e-Government Implementation Framework in South Africa
7.3. A Framework for the Implementation of e-Government as a Service Delivery Mechanism Using the Technology-Organisation-Environment Framework
7.4. Using the e-Government Implementation Framework
7.5. Summary

7.1. INTRODUCTION

The previous chapter analysed the qualitative data collected from the four sets of respondents and the research findings were deliberated to understand the critical factors impacting the TOE framework that was described in Chapter 3. This chapter re-examined the conceptual framework developed in the literature review chapter to construct an all-inclusive framework for the implementation of e-government as a service delivery mechanism based on the empirical findings collected. This framework assisted in solving the research problem on challenges affecting e-government implementation through Thusong Service Centres.

This chapter explained this conceptual framework in-depth, as well as justifying the need for it, describing how it is formulated, and defining its concepts and application. The adjustments required from the expert review are also described and implemented. Finally, this chapter summarises the research findings and compare them with the existing literature reviewed for this study.

The chapter begins with the need of having an e-government implementation framework in South Africa as section 7.2. Section 7.3 focuses on revisiting the conceptual framework developed in chapter 3 (section 3.6) for the development of a comprehensive e-government implementation framework using the empirical data analysed in chapter 6. Section 7.4 details the use of the e-government implementation framework and section 7. 5 summarises the chapter.

7.2. THE NEED FOR AN E-GOVERNMENT IMPLEMENTATION FRAMEWORK IN SOUTH AFRICA

Earlier studies by various researchers recognised the significance of e-government implementation in the developing countries and therefore have identified the requirement for a conceptual framework based on a prevailing underlying theory. This will enrich and enable the adoption and implementation of e-government in the public sector (Alshehri et al., 2012; Aldhabaan, 2012; Alateyah et al., 2013; Alsaif, 2013; Alomari et al., 2014; Alghamdi, 2014; Albesher, 2016).

As a developing country, South Africa is faced with challenges of successfully delivering amenities to citizens. The e-government initiative has offered to improve the situation through the use of ICT. However, little progress has been made in the implementation of e-government owing to numerous aspects that have been identified through the literature review and tested empirical data.

In September 2016, the South African government also adopted the National ICT Integrated White Paper Policy. The objectives of this policy were to attain a citizen-centred comprehensive digital society. The policy is mainly focused on transforming the public service by utilising ICT to enhance service delivery to the communities. This led to the development of the National e-Government Strategy and Roadmap.

The national strategy describes a holistic approach and roadmap that will fundamentally enhance the e-government implementation in the country. This new approach necessitated the government to unlock any challenges concerning policy and institutional arrangements. The government should also engage other critical stakeholders from the ICT industry to acquire the requisite skills, investments and technology innovations in support of e-government (DTPS, 2016).

The ICT Policy White Paper also identified various challenges that affected negatively on the successful implementation of e-government in South Africa. The challenges identified include (1) a lack of a holistic approach in deploying digital transformation in government departments and (2) a lack of a holistic e-government framework with factors that hinder for the effective implementation. So, for effective implementation of e-government in South Africa, there is a need for an implementation framework that will guide the decision-makers in identifying all the relevant factors. Thus, the implementation framework presented in this chapter will contribute to the successful implementation of e-government.

7.3. A FRAMEWORK FOR THE IMPLEMENTATION OF E-GOVERNMENT AS A SERVICE DELIVERY MECHANISM USING THE TECHNOLOGY-ORGANISATION-ENVIRONMENT FRAMEWORK

Chapter six offered a detailed analysis of the empirical data collected from the respondents for the identification of the critical factors that affect the implementation of e-government in South Africa. This section signifies the final modification of the proposed framework for the implementation of e-government as a service delivery mechanism in South Africa. The following sub-sections deliberate and highlight the major outcomes that are relevant to these critical factors.

7.3.1. Critical Factors for Technology Context

The literature review identified ICT Strategy and ICT Infrastructure as the two main factors that influence the technological context. These were discussed in detail in Chapter 6 section 6.2. A major sub-factor that was identified through data analysis was the one-stop-shop portal

or website under the ICT infrastructure factor. A one-stop-shop portal assists in the provision of a single point of interaction for online services.

7.3.2. Critical Factor for Organisational Context

The organisation context focused on five organisational factors that include organisational culture, senior leadership, collaboration, financial resources and resistance to change as discussed in chapter 6 section 6.2.1 - 6.2.5. The analysis of data revealed various critical underlying factors influencing the implementation of e-government in an organisational context. The sub-factors are:

1) **Organisational Culture:** Data Governance Office, Brain Drain and Bureaucratic System in government.
2) **Senior Leadership:** e-Government Ambassadors, e-Government awareness.
3) **Collaboration:** BPR, Inter-ministerial Committee
4) **Resistance to Change**: Political Will.

7.3.3. Critical Factors for Environmental Context

The environmental context poses four factors that include political, economic, regulatory and cultural and the analysis of data has identified a fifth factor which is social. The major sub-factors identified through data analysis are:

1) **Political:** Presidential Commission on the Fourth Industrial Revolution
2) **Economical:** Limited funding
3) **Regulatory:** Regulatory Mandate
4) **Cultural:** Accessibility
5) **Social:** Service Delivery, Awareness and Electricity

7.3.4. The Critical Success Factors (CSFs) – Relationship between Empirical Data and Literature Review

The critical success factors for the implementation of e-government varies from project to project and country to country. The literature review and empirical evidence have determined three aspects that influence the implementation of e-government in South Africa. These include the technological, organisational and environmental contexts and within these contexts, a total of 12 critical success factors have been acknowledged as shown in Table 27 below.

Table 14: Critical Success Factors (CSFs) Analysis – Relationship between Literature Review and Empirical data

Critical Success Factors		Literature Review		Empirical Data	Theory
Context	**Factor (s)**	**Description**	**Reference (s)**		
Technology	• **ICT Strategy** • **ICT Infrastructure**	• A strategy is a detailed plan that speaks to the aims and objectives of an organisation. So, developing a strategy is the first stage of effective e-government implementation. • The primary objective of the development of a strategy is based on stimulating e-government and promoting public engagement by the citizens on government challenges • The ICT infrastructure is a major element of e-government implementation especially if the process is in partnership with other government institutions and business. • Organisations with scalable ICT infrastructure have the opportunity to implement information systems.	Scholl (2003); Alshawi and Alalwany (2009); Macasio (2009); Ebrahim and Irani (2005); Zhu and Kraemer (2005); Kowtha and Choon (2001)	• The South Africa Government has endorsed a National e-government strategy and roadmap. • An e-services portal has been implemented by SITA as a single-point-of-entry for access to more than 70 online government services. This includes initiatives like e-Matric, e-Participation, e-Recruitment and e-NaTIS. This portal will also be enhanced to cater for the fourth Industrial revolution emerging technologies. • There is a silo implementation of e-government initiatives across government departments. • There is no public participation in the development of the National e-Government Strategy as this is conducted through desktop research. • The e-Government strategy vision is not easily understandable. • Lack of logical and physical security across all centres selected for the research. • Obsolete ICT infrastructure including lack of internet access. • No data or information sharing	TOE Framework (Complexity, availability and features of technology)

Organisation	• **Organisational Culture** • **Senior Leadership** • **Collaboration** • **Financial Resources** • **Resistance to Change**	• Organisational culture is defined as a collective understanding of how an institution is structured and operates. • Even though the organisational culture is considered a critical aspect in influencing the adoption of new technology innovation in an organisational context there are other factors like collaboration, the share of information, experience and resistance to change need to be considered. • The senior leadership should possess strategic and leadership skills hence the commitment to the vision and objectives of the organisation. E-government implementation cannot be achieved without the commitment from the senior leadership. • A major obstacle to e-government is the lack of financing new technology	Schein (2010); AL-Shehry et al. (2006); Altameem (2007); Feng (2003); Carvin *et al*. (2004); Ojo et al. (2007); Ndou (2004); Low et al. (2011); Xu and Quaddus (2012).	• Lack of standards, structures and processes in promoting e-government. • Lack of skills to support e-government initiatives including the current emerging 4IR technologies. • Public sector bureaucratic system. • Brain drain – a scenario where IT skilled resources are opting for higher-paying jobs in other provinces. • Establishment of a central Government Data Office for improved Data Governance. • Strategic skill to take decisions • E-government awareness. • Senior Leadership must be ambassadors of e-government. • Information Sharing • Business Process Reengineering • Inter-Ministerial Committee • Stakeholder Management. • Cost implications in the e-government implementation. • There is some form of resistance to change • There is also a political will from the President advocating for the country's digital transformation in government.	TOE Framework (size, structures, processes and employee relationships of an organisation)

Environment	• **Political** • **Economical** • **Regulatory** • **Cultural** • **Social**	• The e-government process involves various political principles that include public responsibility, public involvement, autonomous openness, honesty, trust and service excellence. • The political uncertainty, corruption and insecurity in a country tend to force the citizens to lose confidence in their government which affects the e-government. • E-government adoption and integration are driven by the competitive environment. • ICT and new technology adoption has played a critical part in the economic development and stimulating sustainable delivery of service hence reducing poverty	Bolgherini (2007); Bakry (2004); Hameed (2007); Ahn (2011); Nour et al. (2008); Bolgherini (2007); Bwalya and Healy (2010); Al Nagi and Hamdan (2009); Ndou (2004); Zhu at al. (2003); Braund et al. (2007); Mamaghani (2010).	• There is political stability in the Country making conducive for e-government implementation. • There is also political support from the executive of the country. • The Presidential Commission on Fourth Industrial Revolution has been set up and chaired by the President of the country. • ICT Investment. • Limited e-government funding. • Regulatory Mandate approved by Cabinet • Presence of legal frameworks and policies • Use of indigenous language. • The centre is accessible to everyone irrespective of age, education, religion or sex for the use of online services. • The importance of awareness about e-government • Improvement of service delivery challenges • The physical infrastructure of the building is inadequate including the shortage of electricity	TOE Framework (Government regulatory laws, political will and industry characteristics)

7.3.5. Expert Review Findings

Expert review forms (Table 13 and 14) were prepared for each member of the expert panel and e-mailed to them for their evaluation and input. The respondents for the review were structured as shown in Table 28 below:

Table 15: Expert Panel Categories

Expert Panel No.	Institution	Designation	Role
EP1	Department of Transport	Chief Director	Responsible for managing the e-Natis system
EP2	Department of Home Affairs	Deputy Director-General	Responsible for the strategic management of the Enterprise ICT
EP3	Department of Health	Deputy Director-General	Responsible e-Health initiatives
EP4	South African Revenue Services (SARS)	Chief Director	Responsible for e-filling system
EP5	Department of Education	Chief Director	Responsible for South African School Administration and Management Systems (SA-SAMS)

Both forms are based on evaluating the interview questions and assessing the developed e-government implementation framework respectively and use the criteria of the scoring scale of 1 to 4. The scale is defined as follows **1=Not Acceptable** (major modifications needed); **2=Below Expectations** (some modifications needed); **3=Meets Expectations** (no modifications needed but could be improved with minor changes); **4=Exceeds Expectations** (no modifications needed). The outcome of the evaluation of interview questions is represented by the matrix in Table 29.

Table 16: Content Analysis Matrix for Interview Questions Evaluation by Expert Review

Expert Panel Member	Criteria								
	Clarity	**Wordiness**	**Negative Wording**	**Overlapping Responses**	**Balance**	**Appropriateness of Responses Listed**	**Use of Technical Language**	**Application to Praxis**	**Relationship to Problem**
EP1	3	3	3	3	3	3	4	3	4
EP2	4	3	3	3	4	3	3	3	4
EP3	3	4	3	3	3	3	3	3	4
EP4	3	3	3	3	3	3	3	3	4
EP5	3	3	3	3	3	3	3	3	4
Average	**3.2**	**3.2**	**3**	**3**	**3.2**	**3**	**3.2**	**3**	**4**

The criteria under table 29 are defined as follows:

1) **Clarity** - The questions are direct and specific; Only one question is asked at a time; The participants can understand what is being asked; There are no *double-barreled* questions (two questions in one).

2) **Wordiness -** Questions are concise; There are no unnecessary words.

3) **Negative Wording -** Questions are asked using the affirmative (e.g., Instead of asking, “Which methods are not used?”, the researcher asks, “Which methods *are* used?”).

4) **Overlapping Responses -** No response covers more than one choice; All possibilities are considered;

5) **Balance -** The questions are unbiased and do not lead the participants to a response. The questions are asked using a neutral tone.

6) **Appropriateness of Responses Listed -** The responses apply to all situations and also for those who respond with unique situations.

7) **Use of Technical Language -** The use of technical language is minimal and appropriate; All acronyms are defined.

8) **Application to Praxis -** The questions asked relate to the daily practices or expertise of the potential participants.

9) **Relationship to Problem -** The questions are sufficient to resolve the problem in the study; The questions are sufficient to answer the research questions; The questions are sufficient to obtain the purpose of the study.

Expert Review Outcome for the interview questions: All the review panel members scored 3 or above which implied that the interview questions did meet all expectations with no modifications needed but could be improved with minor changes.

7.3.6. Developed Framework for e-Government Implementation

Government policy decision-makers require a guiding framework that should assist in the successful implementation of e-government as part of their decision building process. The literature review of Chapter 2 and 3 and the analysis of data in Chapter 6 has then produced the following detailed framework for the implementation of e-government shown below by figure 27. The features identified in the initial stage are shown in white and the critical features defined from the collected data are shown in amber.

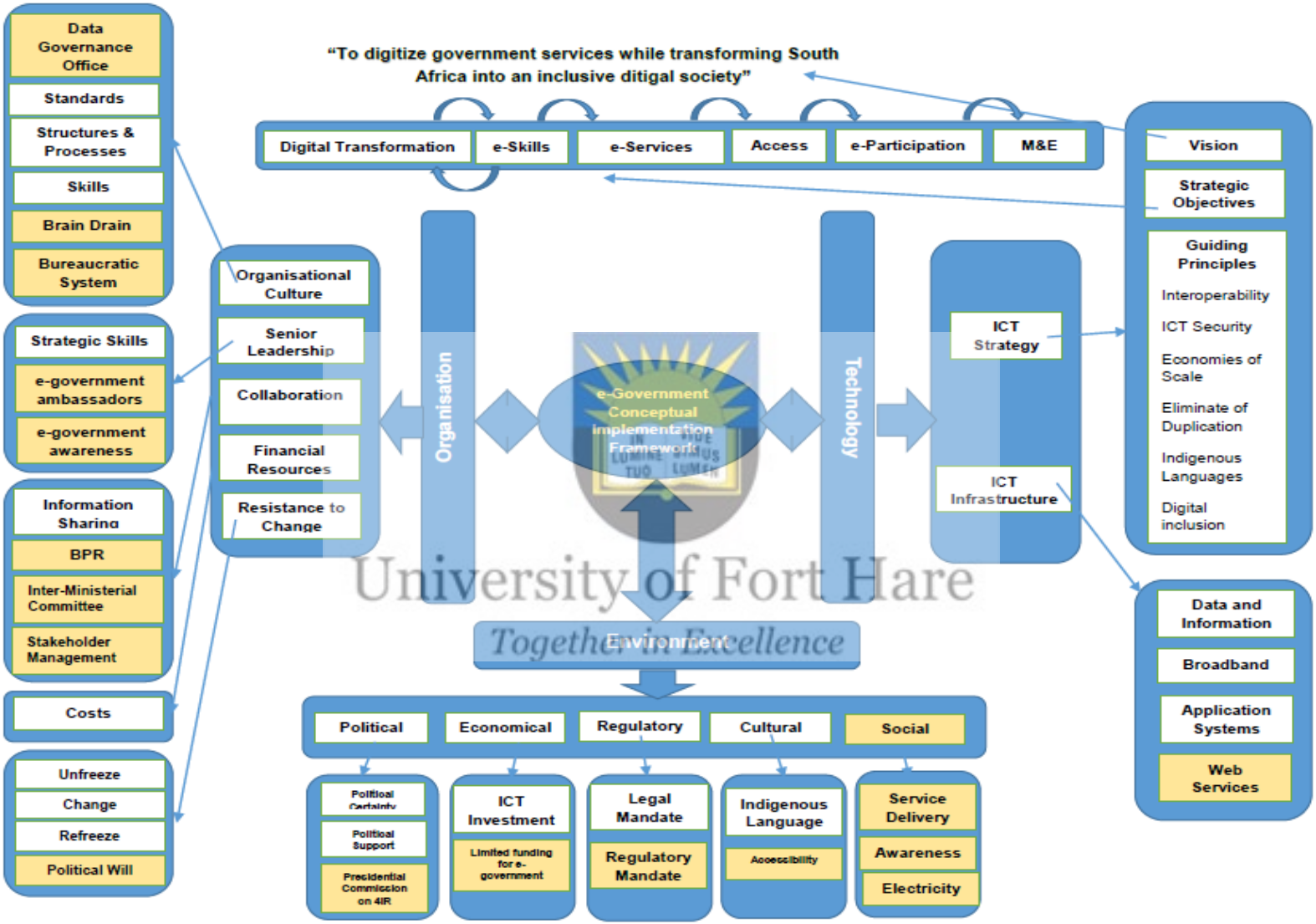


Figure 27: Developed Framework for the Implementation of e-Government before expert review

The scoring scale for the implementation framework expert review is also defined as follows **1=Not Acceptable** (major modifications needed); **2=Below Expectations** (some modifications needed); **3=Meets Expectations** (no modifications needed but could be improved with minor changes); **4=Exceeds Expectations** (no modifications needed). The following results were achieved as shown in Table 30.

Table 17: Content Analysis Matrix for Interview Questions Evaluation

Expert Panel Member	Technology Organisation Environment (TOE) Framework Context			
	Technology	**Organisation**	**Environment**	**Comments**
EP1	3	3	3	• On the Technology context under the ICT Infrastructure factor, the Application Systems and WEB Services should be merged. • Cybersecurity factor should be critical within the ICT infrastructure.
EP2	3	3	3	• The TOE framework should also include a fourth critical context of Social due to its influence in society.
EP3	3	3	3	• The e-government implementation framework should be accompanied by a detailed implementation plan with timelines
EP4	3	3	3	• No comment
EP5	3	3	3	• The e-government implementation framework should form part of the accounting officer's performance contract to monitor and evaluate the progress of the implementation

Expert Review Outcome for the Implementation Framework: All the review panel members scored 3 which implied that the framework was accepted and meet all expectations with no modifications needed but could be improved with minor changes. The final developed framework with added recommendations is represented in figure 28. This indicates that only minor naming changes were indicated by the experts to ensure the framework was usable in the South African e-government domain.

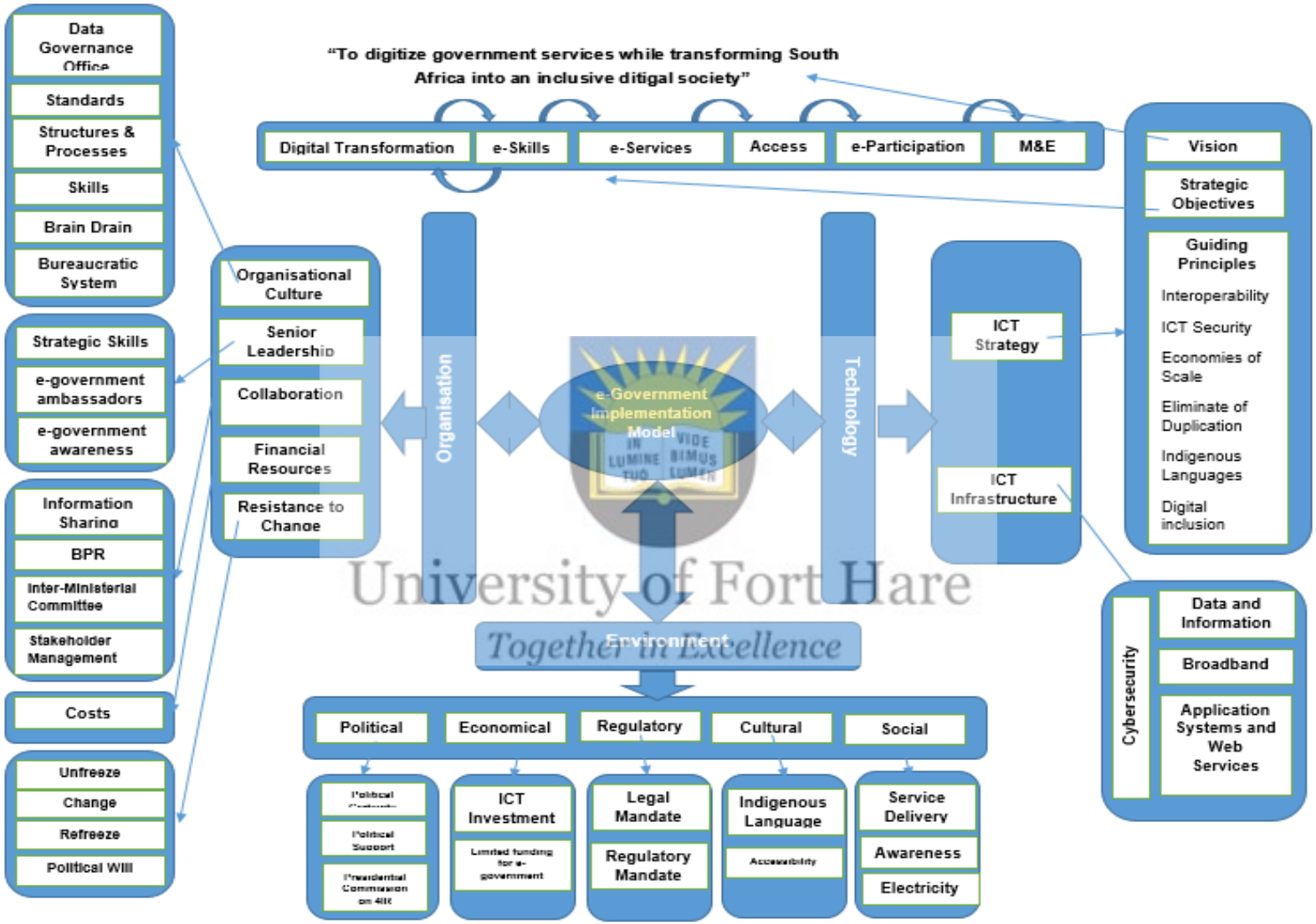


Figure 28: Final Framework for the Implementation of e-Government after expert review

7.4. USING THE E-GOVERNMENT IMPLEMENTATION FRAMEWORK

The implementation of e-government requires strong *political support* from the *senior leadership* of a government that has a *vision* around utilising ICT in providing services to the citizens. The *senior leadership* of government should also act as *ambassadors of e-government* and must be responsible for *e-government awareness* and marketing. This should be accompanied by an all-inclusive *strategy* and roadmap that is responding to the prevailing *political and economic* environments. The *strategy* should also be guided by the *regulatory frameworks* that regulate Information and Communication Technology in South Africa that are aligned to business objectives of government which are based on the National Development Plan (NDP).

The e-government strategy should articulate the government's *vision, strategic objectives and guiding principles*. It must also address *information security and privacy*. Moreover, the strategy should not be a static but a dynamic document. When thoroughly implemented, the e-government strategy should be *monitored and evaluated* through a centralised *Data Governance Office*. The Data Governance Office is also responsible for *data and information standards.* The Data Governance Office should also design and develop a *change management strategy* that will assist in the *change management process* including identifying *skills and training* required to successfully implement e-government.

There must be a *collaboration* between sector departments for *information sharing* and this can be achieved through an *inter-ministerial committee* which is responsible for the *business process re-engineering* and *stakeholder engagement*. This committee must also enable efficient and effective interaction between government entities, business and citizens. Currently, most government departments still use dissimilar applications, platforms, systems and databases that are not talking to each other. This implies that, for the realisation of e-government in government, a *cross-departmental information sharing* is an essential prerequisite.

The evolution of the digital revolution has also increased the *cyberspace security* threats (Chakravorti, 2016). This cyber supremacy has forced the need for cybersecurity as a national security requirement in complementing the digital transformation and ensuring reliability and securing the cyberspace (Elkhannoubi, H. and M. Belaissaoui, 2015; NATO, 2013). In South Africa, a National Cybersecurity Hub has been established by the government and its function as a focal point for collaboration amongst government, industry and civil society on cybersecurity-related challenges in the country.

A government *broadband* backbone should be the network *infrastructure* that connects all the government institutions and managed by SITA. When building this broadband backbone ecosystem, the following must be considered:

1) The *cost implications* – A cost-benefit analysis should be conducted and this will determine the investment required for the Broadband layout and the e-government costs that will sustain the project.
2) The *ICT infrastructure* challenges – this should focus on the applications and systems that will support the one-stop-shop portal for access to online services of government.
3) The *power* provision – this should focus on the *electricity* supply to the rural communities.

The content *website portal* should cater for the entire 11 languages and be *accessible* to all members of society irrespective of religion, disability, race, language or gender. The portal will enable the citizens' contribution and interaction with *online services* allowing citizens instant service experience with government. The *e-services* can also be accessible via multiple digital devices and one should not simply take the existing processes and put them online but by redesigning the business processes.

E-government signifies a new upsurge of technology innovation as well as government transformation towards the *delivery of services* efficiently and effectively. The critical aspect of implementing e-government in the public administration is centred on the effective use of ICT in the provision of services to citizens, business and other government departments. This also allows *public participation* by citizens on government policy formulation processes.

The private sector currently boasts on the improvement of services as it can be observed through the bank services and insurance institutions but it's a different story for the bureaucratic public entities. Citizens are eager on why the public institutions cannot accomplish this fate. The performance of public entities in South Africa raises grave concerns as it can be seen through the performance of the municipalities which are directly serving the citizens.

Therefore, the e-government initiative might assist the public administration in South Africa by using the modern technological innovations that for example are being provided by the *fourth industrial revolution* (4IR). The application of the developed e-government implementation framework for the public administration will also provide the South Africans with new opportunities to interact and work with the public entities anytime and anywhere.

The President of the Republic also established a strong 30-member team for the *Presidential Commission on the Fourth Industrial Revolution (4IR)*. The objective of the commission is to identify strategies that will assist the country and take benefit of the prospects presented by the digital revolution. It is now internationally known that the 4IR represents the transformation in the way humans interact with machines. The National e-Strategy and e-Government Strategy are focusing on the transformative control of the digital tools in various industries and sectors of the economy and hence these strategies lay a strong basis for a programme in the 4IR.

The South African public sector must provide *digitally-enabled services* to the citizens through the use of ICT and other 4IR emerging technologies. The underlying basis of 4IR is the big data and hence government need to urgently develop a *data governance policy*. South Africa currently has different elements of the 4IR spread across Government, the private sector and civil society but there is currently no single plan or blueprint which brings together all key role players into a single focus.

The Commission has devoted to producing a holistic plan to guide South Africa's 4IR Vision by March 2020; this will be heralded by a broad public participation process with relevant stakeholders. The appointed representatives then formed and assigned the following workstreams in complementing the work of the Commission:

1) Infrastructure and Resources.
2) The Research, Technology and Innovation.
3) The Economic and Social impact workstream.
4) Human Capital and the Future of Work.
5) Industrialisation and Commercialisation and
6) Policy and Legislation workstream.

The application of the e-government implementation framework to the e-government project as outlined above clearly shows that the government is ultimately responsible for all public sector resource investments. Its governance role, therefore, spans all public sector activities including project delivery and investment benefit realisation, which is usually through ongoing services. Appropriate and timely project reporting is an important contribution to the government's governance monitoring role.

So, in conclusion, the following four steps need to be taken by the government decision-makers for effective implementation of e-government in South Africa.

1) The review of the existing e-government status and construct on the known practices to appreciate the challenges and critical factors impacting e-government.

2) Adopt the e-government implementation framework to deal with dynamic transformation in the environment.
3) Balance the development of technology, organisation and environment characteristics through prioritising future plans and gains.
4) Monitor and evaluate the progress of e-government projects through the identified structure for positive results.

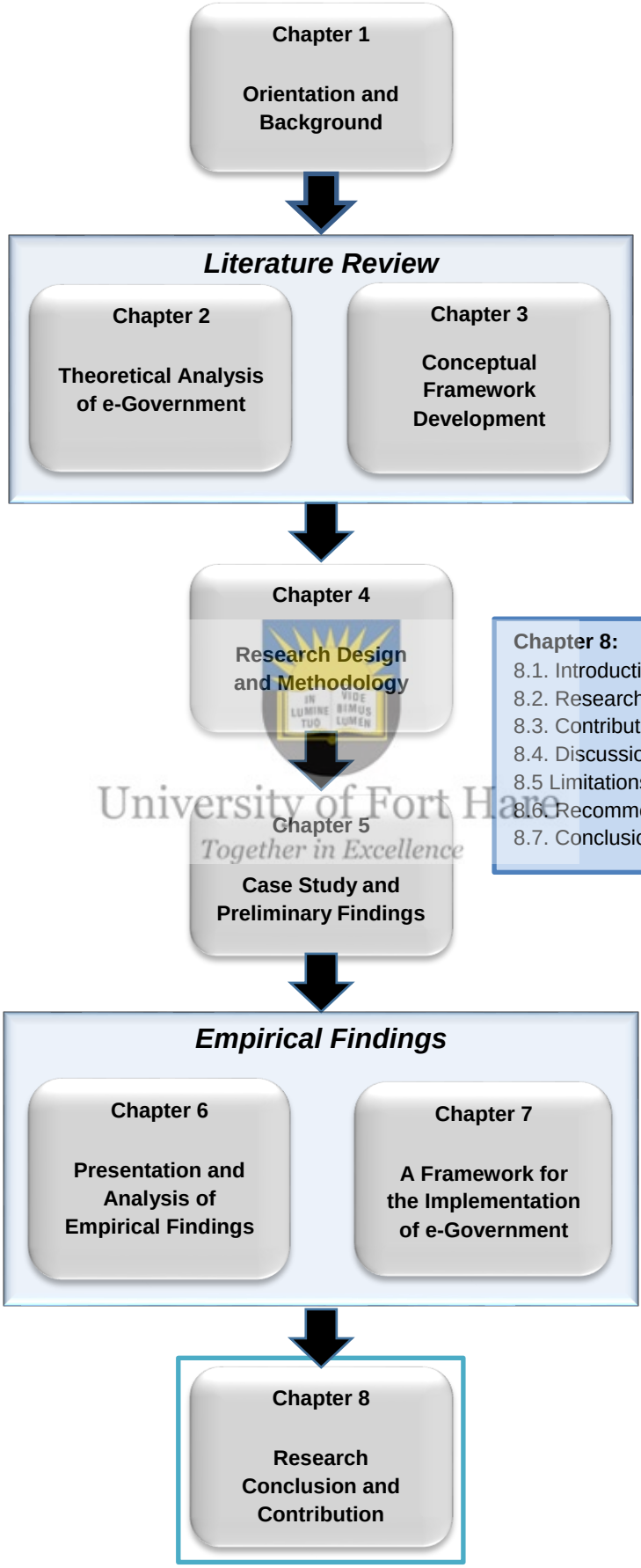
7.5. SUMMARY

This chapter offered a re-examination of the conceptual framework that was developed in chapter 3. The re-examination was influenced by the TOE, the underlying theory, and the research findings of the case study which were both merged in identifying aspects influencing e-government implementation. An implementation framework was then produced to assist the decision-makers in understanding the factors that must be considered as a good practice for effective implementation of e-government as a service delivery mechanism, and an expert review was conducted to validate the final contribution.

The issue of the 4IR emerging technologies was also presented and how the South African government has responded to this new technological innovation. This chapter has achieved its objective of developing a comprehensive e-government implementation framework that should be instrumental in identifying challenges affecting the implementation of e-government through the Thusong Service Centres.

The next chapter presented the research outline and concisely described the research results with the contribution to the body of knowledge and limitations. This chapter also opened a discussion for future research in the field of e-government for the South African Public Sector in the conclusion of this research study.

CHAPTER 8 – RESEARCH CONCLUSION AND CONTRIBUTION



Chapter 8:
8.1. Introduction
8.2. Research Overview and Outcomes
8.3. Contributions of the Research
8.4. Discussions
8.5 Limitations to the Research
8.6. Recommendations for Further Research
8.7. Conclusion

8.1. INTRODUCTION

The previous chapters have offered the research problem and the objective of the study; research questions; the significance of the study; the literature review of the research area; the use of TOE as an underlying theoretical framework, the research methodology utilised; discussion of the research findings and analysis of data, thus leading to the identification of critical factors that impacts on the effective implementation of e-government in South Africa. These factors have resulted in developing a detailed framework for the implementation of e-government as a service delivery mechanism in South Africa. For this study, all the identified critical factors have been examined and their influence in the implementation of e-government discussed with the understanding of assisting government policymakers in taking critical decisions when implementing e-government initiative.

This final concluding chapter focused on answering the research question based on the previous chapters. It also contributes to a set of knowledge to the subject field of e-government with endorsements for further research. The researcher has arranged the chapter as, section 8.2, represents research overview and outcomes. Section 8.3 identifies all the research contributions. Section 8.4 discusses limitations to the research followed by recommendations for further research as section 8.5. Section 8.6 summarises the chapter.

8.2. RESEARCH OVERVIEW AND OUTCOMES

The challenge that is facing South Africa today, is the lack of well-organized and real delivery of services to the communities. There is also an advance in the development of technology innovations around the world which is spearheaded by the emergence of the fourth industrial revolution. Considering these technology developments, e-government has emerged as key to the service delivery challenges in South Africa. This includes the lack of a holistic e-government implementation framework that should guide the decision-makers in identifying critical factors that influence the accomplishment of the e-government initiative.

This has resulted in a necessity of conducting e-government research in the Information Systems (IS) area to understand the implications involved especially at an organisational level for emerging countries like South Africa. So, this research overview is based on four critical phases that were carried through the research process to reach the research outcomes. These are presented in the next sub-sections.

8.2.1. Research Overview

The implementation of e-government by the public administration has a potential to match the online offerings of the private sector that includes the competent and operational provision of

services to citizens, business and other government entities (Sofiane, 2005; Flak *et al.,* 2009; Al-Shafi *et al*, 2009). The implementation of e-government in the developing countries is often impacted through the lack of leadership skills, inadequate technology and insufficient financial and human resources as discussed in the literature review chapter. Moreover, to fully understand these e-government challenges and how they impact the positive implementation of the initiative thorough investigation needed to be conducted. This can only be performed through a research study.

Therefore, the aim of this research was based on the construction of an implementation framework for e-government as a service delivery mechanism in South Africa. This implementation framework should be utilised by the decision-makers in government in identifying areas of concerns for the successful e-government implementation. To try to achieve the objectives of the study, the following research process was performed:

- ***Phase 1:*** The research background which included the research objectives and research questions (chapter 1); this is followed by the empirical literature analysis of e-government (chapter 2); the focus of chapter 2 was on the development, definitions and domains of e-government, the drivers of e-government, the maturity stages, the benefits of e-government, barriers and challenges of e-government. Chapter 2 also presented the connection between e-government and public service delivery and how this affects the emerging countries related to the advanced countries. Chapter 2 was concluded with a detailed analysis of e-government in the republic and how it will be impacted by the emerging technologies of the fourth industrial revolution.

  Chapter 3 is centred around the theoretical review exploration of the underlying theoretical framework, the Technology Organisation Environment (TOE) framework. Chapter 3 also included the construction of a conceptual framework that was to be used as a guide in the problem area.

- ***Phase 2:*** The next phase was focusing on the structured research methodology (chapter 4), research methods (chapter 5) and the ethical clearance applicable to this research. The research used the exploratory qualitative research approach to collect data using SITA as an agency responsible for ICT in government in South Africa, the Senior ICT leadership from various national, provincial and local government entities, the Thusong Service Centre managers and the centre end-users. Chapter 4 started with an explanation and justification for selecting the interpretive and exploratory approach; the chosen research methodology and methods were then applied in chapter 5 and 6 to experimentally discover the conceptual framework and the critical aspects identified in the framework.

The next chapter focused on the case study as represented by the Thusong Service Centres in the Eastern Cape. This was done to explain the uniqueness of the phenomena being investigated and what differentiates it from others. The focus was on socio-economic and political challenges; ICT in the Province; Provincial initiatives of e-government and the structure and guiding objectives of the Thusong Service Centres. Chapter 5 concluded with the preliminary findings of the research.

- ***Phase 3:*** This part of the research process was focused on the qualitative data analysis of the collected information from the problem area (chapter 6). Chapter 6 also detailed the critical factors that impact the successful implementation of e-government as guided by the underlying theoretical framework of the Technology Organisational Environment (TOE) framework. Chapter 7 of this phase was the development of a detailed implementation framework of e-government as guided by the conceptual framework from chapter 3 and critical aspects that affect the e-government implementation as analysed within the collected data. An expert review was also conducted in the evaluation of the interview questions and the developed framework. Phase 3 also presented a procedure of utilising the developed framework.
- ***Phase 4:*** This is the final phase of the study and consists of the overall study outcomes, contributions to the body of knowledge, discussions, the recommendations for future research in e-government and conclusions of the study (chapter 8).

The four-phase process led to the following research outcomes:

8.2.2. Research Outcomes

The main research aim was to build a framework for the implementation of e-government as a service delivery mechanism in South Africa. This led to identifying critical factors that impact the implementation of e-government in the country by selecting the Thusong Service Centres in the Eastern Cape as the case study. So, it was important to answer the following main research question:

1) *What are the necessary elements of a framework for the implementation of e-government as a service delivery mechanism in South Africa?*

This research investigated and identified the critical elements that impact on the successful implementation of e-government in general and then specifically focused on South Africa. This was performed through the analysis of literature in Chapter 2 and Chapter 3, with the development of a conceptual framework. The conceptual framework was then tested through the collected data analysed from the problem area. The qualitative data analysis was guided

by the TOE framework under the Technology, Organisation and Environment contexts as discussed in Chapter 6, section 6.6 – 6.9 with the underlying sub-sections. Chapter 7 (section 7.4) detailed the use of the developed implementation framework as a mitigation process for achieving the required service delivery results.

Based on this main research question a series of sub-questions were constructed to answer the main question. The sub-questions were answered as follows:

2) *What are the challenges that impact on e-government implementation for the delivery of services in the Thusong Service Centres?*

Chapter 2 (section 2.3) is specifically dealing with the barriers and challenges of implementation of e-government and these are ordered in the following categories: (1) technical viewpoint, (2) organisational, (3) social, (4) fiscal and (5) monitoring and evaluation. These barriers and challenges affect the implementation of e-government and therefore impacting on the delivery of services to citizens as shown below:

1) **Technical:** ICT Infrastructure, Security and Privacy.
2) **Organisational:** Leadership, Resistance to Change, Collaboration and Training
3) **Social:** Culture and Digital Divide.
4) **Financial**: High Costs.
5) **Monitoring and Evaluation:** Monitoring and Evaluation Processes.

Chapter 3 identified the change management process as having a significantly influential role in the implementation of e-government. So, change management is viewed as a creative dynamic process that is controlled by the needs of an organisation whilst preserving the organisational vision and mission.

Chapter 6 also recognised certain critical factors through the empirical data collected through the TOE framework that influences the e-government implementation which was summarised in chapter 7 as follows:

1) Technological Context
    a. ICT Infrastructure: Website Portal
2) Organisational Context
    a. **Organisational Culture:** Data Governance Office, Brain Drain and Bureaucratic System in government.
    b. **Senior Leadership:** e-Government Ambassadors, e-Government awareness.

c. **Collaboration:** BPR, Inter-ministerial Committee

d. Resistance to Change: Political Will.

3) Environment Context

a. **Political:** Presidential Commission on the Fourth Industrial Revolution

b. **Economical:** Limited funding

c. **Regulatory:** Regulatory Mandate

d. **Cultural:** Accessibility

e. **Social:** Service Delivery, Awareness and Electricity

The above-mentioned challenges and challenges play a critical part in impacting the implementation of e-government in South African government entities. These challenges must be managed effectively to assist in achieving a successful implementation of e-government for better delivery of services to the citizens of South Africa.

3) What is the role of the Thusong Service Centres in the use of e-government?

Chapter 5 and 6 focused mainly on the role of the Thusong Service Centres in the use of e-government. In chapter 5, the Thusong Service Centres have been defined as the service centres for government based in rural communities and are utilising ICT to provide online government services to the rural communities. The Eastern Cape Provincial Administration through the Departments of Human Settlements, Economic Development and Environment Affairs and Tourism (DEDEAT), Education and Health are significantly active in the Thusong Service Centres providing systems like e-Housing, e-Environment and e-Leave. These systems have been confirmed by the centre managers through the interview process in chapter 6.

4) What role is being played by major partners in the implementation of e-government in the Thusong Service Centres?

The Department of Telecommunications and Postal Services (DTPS) which is now the new Department of Communications and Digital Technologies (DCDT) has the role of being a custodian of the National e-Government Strategy. SITA is the technical implementer of the Strategy as confirmed by the SITA Executive in Chapter 6 during the data collection. The SITA Executive explained that the e-government journey is a multi-stakeholder and multi-sectoral journey that involves various organs of states, private sector, academia, research institutes, civil society, non-government organisations (NGOs), and non-profit-making organisations (NPOs).

There are also various government departments deploying individual e-government projects as discussed in chapter 2. These initiatives include Departments of Transport (e-Transport), Education (e-SAMS), Social Development (e-Document Flow), SARS (e-filing), Labour (u-filling) and Home Affairs (Smart ID). The Department of Government Communication and Information Systems (GCIS) has also created an online website that hosts public sector information.

The research outcomes are summarised as shown in Table 31.

Table 18: Summary of Research outcomes and relationship to Research Objectives (RO) and Research Questions (RQ)

Main Question ***What are the necessary elements of a framework for the implementation of e-government as a service delivery mechanism in South Africa?*** **(MQ)**		
Research Objective (RO)	**Research Question (RQ)**	**Chapter(s)**
To explore the challenges that impact on e-government implementation for the delivery of services. **(RO1**)	*What are the challenges that impact on e-government implementation for the delivery of services in the Thusong Service Centres?* **(RQ1)**	Chapter 2, 3, 6 and 7
To explore the role of the Thusong Service Centres in the use of the e-government. **(RO2)**	*What is the role of the Thusong Service Centres in the use of e-government?* **(RQ2)**	Chapter 4, 5 and 6
To identify the role played by major partners in the e-government implementation in the Thusong Service Centres. **(RO3)**	*What role is being played by major partners in the implementation of e-government in the Thusong Service Centres?* **(RQ3)**	Chapter 2 and 6
Final Product ***To develop a framework for the implementation of e-government as a service delivery mechanism in South Africa. (FP)***		

The key findings in terms of the research outcomes are discussed below:

Finding 1: The literature review relative to challenges that impact e-government implementation at an organisation level in South Africa is limited. The available literature is

more generalised around the factors that influence the acceptance of e-government through user perspective in the emerging countries. The reason for this limitation is based on the fact that the implementation of e-government is a fairly new research area for South Africa. So, generally, there is a gap around the implementation of e-government in the emerging countries and South Africa in particular. This study adopted the Technology Organisation Environment (TOE) framework as an underlying theory to close this gap by identifying aspects influencing on e-government implementation at an organisational level as seen through the three main contexts of technology, organisation and environment.

It is envisaged that the presented implementation framework (as presented in Figure 27) would enable decision-makers in the South African government to apply the framework to better understand the challenges affecting e-government success; thereby delivering services to the citizens efficiently and effectively.

Finding 2: There is a requirement for a more understanding of the introduction of e-government in the country. This is based on the definition of e-government as discovered by the review of the literature and the empirical evidence. As an example, some Thusong Service Centre managers assume that by just deploying a system online means e-government. The research did address this challenge by elevating the *awareness* factor both on the organisation and environment contexts (Chapters 6.7.2.1, 6.8.51 and 7.3.2). This challenge can also be mitigated as discussed in chapter 7.4.

Finding 3: The literature revealed a robust association between e-government and existing environmental conditions of a particular country. This was also empirically proven through the prerequisite for e-government implementation that included (1) there must be political stability and political will from the government leadership (2) there must also be funding ring-fenced for e-government (3) there must exist a scalable infrastructure (4) lastly, the power supply is a big problem especially in the rural Eastern Cape. The mitigation process has also been discussed in chapter 7.4. This is a huge gap that has been identified between the developed and the developing countries.

Finding 4: The literature review identified 30 sub-factors from 11 factors that were based on three TOE framework contexts, represented by the technology, organisation and environment contexts. The empirical evidence revealed 16 extra sub-factors and 1 factor (social) under the environmental context as depicted in Figure 27. The identified sub-factors were previously explored by other researchers, but these were considered from a citizens' perspective rather than at an organisational level especially from a developing country's standpoint. Therefore, it was critical to examine these factors impacting e-government implementation from an

organisational standpoint as represented by the Thusong Service Centres, thereby assisting government institutions in South Africa to successfully implement e-government.

Finding 5: The analysis of both the literature and the empirical data has revealed that the implementation of e-government is a difficult task since there are many factors and aspects to be considered such as the power distribution, ICT infrastructure and culture; this may also result in resistance to change problems. Its implementation affects a variety of public institutions, businesses and the entire society. This is the reason there is a high e-government project failure rate within the developing countries and South Africa is still at an early stage.

Finding 6: The empirical data has also revealed the issue of the Fourth Industrial Revolution (4IR) in South Africa and how it influences e-government. In mitigating the risk of being left behind as a country, the president of the republic nominated a 30-strong team that form the Presidential Commission on the Fourth Industrial Revolution. The main objective of the commission is to manage the progress of South Africa's response through an inclusive roadmap to deal with the 4IR. Moreover, it must identify applicable policies, strategies and tactics that will guide the country towards an economical universal participant.

The University of Fort Hare has also joined 4IRSA partnership with the Department of Communications and Digital Technologies (DCDT), University of Johannesburg, University of Witwatersrand, Telkom, Vodacom and Huawei to stimulate a comprehensive nationwide discussion to outline a clear national solution to the Fourth Industrial Revolution in the country. Its objective is to supplement and support other national events involving the 4IR, more especially the Presidential Commission on the 4IR.

Finding 7: The developed implementation framework in figure 27 revised from the conceptual framework in figure 14 could be endorsed and be utilised as a guide for decision-makers in government. Moreover, it should empower other researchers to fully appreciate the implementation of e-government challenges through the framework.

The research findings are summarised as shown in table 32 below followed by the contribution to the field of e-government as section 8.3.

Table 19: Summary of Research Findings

No	Research Finding	Relevant Chapter (s)	Comment & Mitigation
1	Limited study analysis on e-government implementation within South Africa	Chapter 2 and 3	• A gap in the implementation of e-government among the developing countries and South Africa • The developed framework would assist the government decision-makers
2	Absence of comprehension of e-government in South Africa	Chapter 6 and 7	• Just deploying systems online does not mean e-government. • Identified a critical factor of "awareness" through empirical evidence that needs to be well-thought-out when implementing e-government.
3	A strong association between e-government and environmental conditions.	Chapter 6 and 7	• Challenges like political stability and political will greatly influence the e-government initiative. • This has been fully discussed in chapter 7.4 on the utilising the framework; that government must first have a stable political environment and have a political will to implement e-government.
4	Identified critical factors and sub-factors	Chapter 3, 6 and 7	• The literature review identified 30 sub-factors from 11 factors and 3 contexts (Technology,

			Organisation and Environment); the empirical evidence identified 16 extra sub-factors as shown in Figure 27. • Previous studies have identified these factors through a citizen's perspective as opposed to this research which is based at an organisational level.
5	E-government implementation is not an easy project	Chapter 5, 6 and 7	• Impacts various organisations like the public institutions, businesses and society as a whole. • Consideration of cultural aspects, ICT infrastructure and power distribution
6	Impact of the Fourth Industrial Revolution	Chapter 2, 3, 6 and 7	• There are emerging technologies brought by the current fourth industrial revolution which might impact the e-government implementation • The President of the country has appointed a 30-member team of The Presidential Commission on Fourth Industrial Revolution to oversee policies and strategies to guide the country during this era.
7	The developed e-government implementation framework	Chapter 2,3,4,5,6 and 7	• A holistic e-government implementation framework

			was developed and presented. • To be utilised as a guide for government policymakers in the implementation of e-government; empower other researchers in conducting further research around e-government initiative

8.3. CONTRIBUTIONS OF THE RESEARCH

The research study on the construction of a framework for e-government implementation makes both theoretical and core contributions to the set of knowledge as deliberated in the subsequent sub-sections.

8.3.1. Theoretical Contribution

The researcher claims the following theoretical contributions:

Contribution 1: The literature review revealed that no theoretical model is explaining the challenges that impact the e-government implementation in emerging countries. As a contribution, the researcher suggested the conceptual framework (figure 14) to answer the research problem by utilising an underlying Information Systems (IS) theoretical TOE framework and identified aspects that may influence the implementation of e-government (chapter 3). The framework was then tested using the case study as seen through the Thusong Service Centres and the empirical evidence from the collected data made it possible for the revision of the proposed conceptual framework. The outcome was a developed implementation framework for e-government (chapter 7.1). The developed implementation framework contributes to the area of e-government studies through these reasons:

1) The framework offers a detailed aspect of the factors and challenges that influence the implementation of e-government in South Africa.
2) The framework unveiled new factors based on the influence of the fourth industrial revolution that was previously unknown to the field of e-government.
3) The research was conducted using four sets of interviews, these included SITA executives, Senior ICT Managers from National and Provincial departments, the Thusong Service Centre (TSC) Managers and the end-users of the Thusong

Service Centres. This allowed the researcher to construct a compact analysis of the aspects that impact the execution of e-government in South Africa from different perspectives.

Contribution 2: The outcomes and knowledge from the research study on the factors that impact the implementation of e-government contribute to the literature of e-government on introducing e-government into public entities of the developing countries and Africa in general. This also adopted an all-inclusive approach by investigating using the national, provincial and local entities of government.

Contribution 3: Chapter 2 of the research study identified the theoretical relationship between the drivers and obstacles of e-government implementation and how they impact the initiative. This assisted in developing the conceptual framework that was tested through the problem area.

Contribution 4: The research study made an important contribution to e-government implementation by empirically collecting evidence using end-users and government officials. The previous studies of e-government implementation were only focusing on user and systems perspectives (Al-Somali et. al. 2010; Koul and Eydgahi, 2017).

Contribution 5: The final theoretical contribution of the research study is based on the 1 factor (social) and 16 extra sub-factors that have been added to the existing knowledge as shown in figure 27.

8.3.2. Core Contribution

A core contribution of the research study is built on:

1) The developed e-government implementation framework (figure 27) that should be utilised by government decision-makers in identifying critical factors that impact e-government implementation. The factors were acknowledged through the review of the literature (chapter 2 and 3) and complemented by the empirical evidence collected from the user and government perspectives (chapter 5, 6). The application on utilising the framework to have an effective and efficient service delivery is also presented and discussed in chapter 7.4.
2) The investigation of real-world challenges as represented by the Thusong Service Centres for features influencing the implementation of e-government (chapter 5, 6 and 7), thereby finding solutions for the delivery of services to the citizens, businesses and other government departments.

8.4. DISCUSSIONS

These following points have been noted based on the findings of the research study:

1) The research intended to develop a framework for the implementation of e-government as a service delivery mechanism in a developing country, represented by South Africa and this was achieved.
2) A single case study was represented by the real-world challenges of the Thusong Service Centres as the service centres of government.
3) The framework also provided both theoretical and practical understandings into e-government implementation in South Africa.
4) The literature review has shown that the implementation of e-government has been proven by many scholars to be an extensive and multifaceted process.
5) Although there is a general compromise among scholars and experts that e-government implementation challenges are not only technology-based but also related to organisational and environmental contexts; there is also no agreement between these researchers on a specific approach of implementation including the number of maturity stages required to fulfil the fully developed e-government.
6) The developed framework tried to close that gap through literature review and collected data.
7) It is evident that there no prior study conducted in South Africa for the Thusong Service Centres in the implementation of e-government hence this research contributed to this area of knowledge.
8) The developed framework should also be instrumental for government policymakers in identifying challenges that hinder the successful implementation of e-government in the South African public services.
9) The literature review and the data collection chapter have also shown e-government's positive impact on service delivery through the encouragement of efficiency and effectiveness.
10) The proper implementation of e-government enhances the use of ICT and hence reduces costs and delays in the discharge of duties.

8.5. LIMITATIONS TO THE RESEARCH

Every research study that involves technology innovation will experience some limitations as discussed below:

1) The TOE framework is based on investigation of the adoption and implementation of technology innovation like e-government focusing on three contexts, technology,

organisation and environment. The framework seems to be straightforward but defining these features could be a challenging due to the fact that the data around them depends on views from individual members of an organisation. Individual members of an organisation can have conflicting views about these TOE characteristics. Some researchers are avoiding this challenge by focus on the contribution from decision makers.

2) The research study was focusing only on the Thusong Service Centres in the Eastern Cape as the case study, so it would not be easy to decide on whether the developed e-government conceptual framework will apply to other developing countries.
3) Another limitation that was worth noting is based on the fact that the study was focusing on four sets of public entities that are key in the provisioning of services through e-government. These included SITA, National and Provincial government departments and the Thusong Service Centre managers and end-users. Each of these entities differs in the organisational arrangement which impacts the need to implement e-government.
4) The study embraced a qualitative approach for the data collection and analysis of data as explained in detail in chapter 4. The qualitative approach was chosen due to the allowance of collecting rich data and a deeper understanding of the occurrence being studied. This might lead to a possible bias as explained in Chapter 4, however, this was minimised through triangulation of the interview process as represented by the four sets of respondents and the use of the secondary data.
5) The findings emanating from this research study that led to the development of a framework for the implementation of e-government would be different to the results endorsed in other countries due to the evolvement of e-government of time (Samaratunge and Wijewardena, 2009).
6) The limitation within this research study was based on the distance travelled by the researcher to conduct the direct interviews between the Thusong Service Centres and the availability of the Centre Managers. This stems from the background that no funding was allocated to the researcher by the University. So, the data collection and analysis for this research study was time intense and cost demanding.
7) Lastly, some of the end-user interviews were conducted in Xhosa and had to be decoded into English before capturing the information in NVIVO. This delayed the data analysis process.

8.6. RECOMMENDATIONS FOR FURTHER RESEARCH

The e-government implementation research study can be further developed with areas of interest focusing on the following recommendations:

1) **Recommendation 1:** The critical aspects that impact on the e-government implementation were explored using the review of the literature and a single case study. The researcher recommends the extension to multi-case study to examine more challenges affecting e-government implementation. Moreover, numerous multi-case study analysis is recognized as a decent research structure (Yin, 2009).
2) **Recommendation 2:** The underlying TOE framework used in this research study is based on three contexts of organisation, technology and the environment. The researcher has identified through the empirical evidence a critical factor of social factor which plays an important role in the implementation of e-government especially in the rural environment of our Province. So, further studies of challenges affecting e-government implementation need to be extended to focus on the social context.
3) **Recommendation 3:** The research study used a limited number of user perspective in distinguishing the challenges that are impacting e-government implementation. It is recommended that a combination of the TOE and a user's acceptance theoretical model like TAM and UTAUT be utilised so to examine the user perceptive in detail. So, further research is recommended and could perhaps study the acceptance of e-government by the South African citizens.
4) **Recommendation 4:** E-government is part of Information Systems (IS) field that is critical in government and must be guided by change management processes of government. Change management is particularly important in government today than any other time before due to challenges like corruption, transparency and efficiency. So, the impact of change management on the implementation of e-government needs to be further explored.
5) **Recommendation 5:** Finally, the fourth industrial revolution (4IR) is a new concept that is disrupting all industries at an aggressive speed than any other three previous revolutions. It is categorised by the abundance of information through big data, the increase in robotics and autonomous machines, artificial intelligence (AI), nanotechnology, blockchain and Internet of Things (IoT). The speed of the technology innovation and the emerging technologies drive the traditional government to its limits forcing the government to be data-driven and citizen-focused. This is an area that needs more research concerning e-government and how it is affecting the public sector, businesses, and society in general.

8.7. CONCLUSION

The last chapter discussed the research process that was used in the entire research study tabulating the research overall outcomes, the contribution to the body of knowledge, limitations as experienced during the research and recommendations for further research. Throughout

the research, the researcher determined some of the critical factors that impact on the e-government implementation as guided by the main research question. The entire process was done through the use of an underlying Information Systems (IS) theoretical model of Technology-Organisation-Environment (TOE) framework.

The research study focused on the three spheres of government as represented by the National, Provincial and Local governments by utilising the Thusong Service Centres as the problem area and a case study. The research problem is based on the challenges that are currently being experienced in implementing e-government in South Africa through the Thusong Service Centres. Various factors that impact the effective implementation of e-government in South Africa have been identified through literature review and complemented by the empirical findings through the tested conceptual framework. These factors are critical for e-government implementation at the organisational level as tested by the research study.

The research study reviewed the e-government literature in detail in chapter 3 followed by the theoretical analysis of the underlying Technology Organisation and Environmental (TOE) framework in chapter 3 focusing on Technology, Organisation and Environmental contexts thus formulating a conceptual framework to be tested with empirical data in chapter 6. The empirical data was collected from Senior ICT leadership from selected national, provincial and local governments including two executives from SITA who are responsible for the implementation of e-government in South Africa. The data was analysed using content qualitative analysis and the conceptual framework that was developed in Chapter 3 was revisited using the empirical data analysed in chapter 6. Expert review panel members were selected and mandated to evaluate both the interview questions as relevant in answering the research question or not and the proposed implementation framework. Consequently, chapter 7 presented the holistic e-government implementation that can be used as a service delivery mechanism in South Africa. In the final concluding chapter 8, the main research question and sub-questions were answered in this study and the findings integrated into the proposed e-government implementation framework.

This study has therefore highlighted some key challenges that the government institutions experience during the e-government implementations and how this affects the provision of services to the citizens. By developing the e-government implementation framework through this study, it is hoped that this should contribute to the government policy-makers to take a step further in appreciating the aspects that impact on the successful implementation of e-government in the developing countries and South Africa in particular.

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List of Appendices

Appendix A: Ethical Clearance Approval Letter

University of Fort Hare
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ETHICS CLEARANCE
REC-270710-028-RA Level 01

Project Number:	PID011SMAD01
Project title:	A model for the implementation of e-government as a service delivery mechanism in South Africa: The case of the Eastern Cape Thusong Service Centres.
Qualification:	PHD in Information Systems
Principal Researcher:	Ayanda Madyibi
Supervisor:	Prof R. Piderit
Co-supervisor:	N/A

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby grant ethics approval for PID011SMAD01. This approval is valid for 12 months from the date of approval. Renewal of approval must be applied for BEFORE termination of this approval period. Renewal is subject to receipt of a satisfactory progress report. The approval covers the undertakings contained in the above-mentioned project and research instrument(s). The research may commence as from the 22/08/19, using the reference number indicated above.

Note that should any other instruments be required or amendments become necessary, these require separate authorisation.
Please note that the UREC must be informed immediately of

- Any material changes in the conditions or undertakings mentioned in the document;
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research.

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

The UREC retains the right to

- Withdraw or amend this approval if
  - Any unethical principal or practices are revealed or suspected;
  - Relevant information has been withheld or misrepresented;
  - Regulatory changes of whatsoever nature so require;
  - The conditions contained in the Certificate have not been adhered to.

- Request access to any information or data at any time during the course or after completion of the project.

Your compliance with DoH 2015 guidelines and other regulatory instruments and with UREC ethics requirements as contained in the UREC terms of reference and standard operating procedures, is implied.

The UREC wishes you well in your research.

Yours sincerely

22/08/2019

Professor Pumla Dineo Gqola
Acting UREC-Chairperson
22 August 2019

Appendix B: Letter of Consent

University of Fort Hare
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Ethics Research Confidentiality and Informed Consent Form

I, Mr **Ayanda Madyibi** is asking 22 respondents in the Eastern Cape to answer some questions, which we hope will benefit your community and possibly other communities in the future.

The University of Fort Hare's Information Systems Department is conducting research regarding the development of a model for the implementation of e-government as a Service Delivery mechanism in South Africa using the Thusong Service Centres as the case study.

The main research objective is to build an implementation model for e-government that will drive service delivery. The model can also be adopted by government institutions in South Africa and also contribute to the electronic government area of study for further research.

The University Research Ethics Committee has approved this research project and the Ethical Clearance number is **PID011SMAD01**. The Committee reserves the right to inspect the research records collected during this research project in order to ensure that the project is being conducted ethically.

Please understand that you are not forced to take part in this study and the choice of whether to participate or not is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you choose not to take part in answering these questions, you will not be affected in any way. If you agree to participate, you may exit the interview at any time, you wish not to continue answering the interview question. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way. Confidentiality will be observed professionally.

I will not be recording your name during the interview and no one will be able to link you to the answers you give. Only the researchers will have access to the unlinked information. The information will remain confidential and there will be no "come-backs" from the answers you give.

The interview will last less than 30 minutes. I plead that you to be open and honest when answering these questions. Some questions may be of a personal and/or sensitive nature. Some questions may happen that you have not thought about before, and which also involve thinking about the past or the future. We know that you cannot be certain about the answers to these questions but we ask that you try to think about these questions. When it comes to answering questions there are no right and wrong answers.

You can contact me or my supervisor if you have any further questions:

Mr Ayanda Madyibi

University of Fort Hare

Telephone number: 076 413-0096

E-mail: ayanda.madyibi@icloud.com

Prof Roxanne Piderit

Information Systems Department

University of Fort Hare

Telephone number: 043 704-7094

E-mail: rpiderit@ufh.ac.za

If you have any further queries regarding the ethical clearance process, please contact the Dean of Research.

GMRDC

University of Fort Hare

Telephone number: 0437042319

Appendix C: Informed Consent

University of Fort Hare
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INFORMED CONSENT

I hereby agree to participate in research regarding the development of an implementation model for e-government as a service delivery mechanism in South Africa using the Thusong Service Centres as a case study. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop and exit this interview at any point should I not want to continue and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally.

I have received the telephone number of a person to contact should I need to speak about any challenges which may arise in this interview.

I understand that this consent form will not be linked to the interview and that my answers will remain confidential.

I understand that if at all possible, feedback will be given to my community on the results of the completed research.

……..

Signature of participant **Date**:……..

I hereby agree to the tape recording of my participation in the study

……..

Signature of participant **Date**:……..

Appendix D: Interview Questions – SITA Project Managers / Consultants

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INTERVIEW QUESTIONS – SITA PROJECT MANAGERS / CONSULTANTS

1) Is there an e-government strategy adopted by the government in South Africa?
2) What are the key focus areas of the e-government strategy?
3) Is the e-government strategy aligned with the National Development Plan as envisaged by Vision 2030?
4) How far is the implementation process for the e-government strategy?
5) Can you briefly identify e-government projects that are currently in operation across government?
6) Who are the key stakeholders that are partnering with SITA in the implementation process?
7) Are public sector entities willing to accept the change through e-government implementation?
8) Are there any challenges or barriers that are being experienced by SITA in the implementation process?
9) Is there any political leadership influence in the implementation process?
10) In your opinion, what are the critical steps that must be undertaken by the government before the implementation of e-government?

Appendix E: Interview Questions – CIOs / Senior Managers from Government Departments

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INTERVIEW QUESTIONS – CIOs / SENIOR MANAGERS FROM GOVERNMENT DEPARTMENTS

1) Is your departmental Top management aware of the significance of e-government?
2) Is e-government part of your strategic plan?
3) Is there a clear vision of the strategic plan towards e-government?
4) Is there any budget allocated to your Department for the implementation of e-government?
5) How matured is your ICT Infrastructure for the support of the implementation of e-government?
6) What are the key barriers and challenges regarding the implementation of e-government?
7) Are there any awareness sessions within your Department regarding e-government?
8) Is the ICT organisation structure resourced enough to support e-government?
9) What is the qualification level of your ICT staff responsible for e-government in your department?
10) What do you think is needed by the public sector organisations to successfully implement e-government?

Appendix F: Interview Questions – Thusong Service Centre Managers

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INTERVIEW QUESTIONS – THUSONG SERVICE CENTRE MANAGERS

1) How was e-government introduced in the centre?
2) Was there any training provided by the participating departments on e-government for the centre?
3) Was the centre promoted or marketed across the community?
4) Is there enough ICT infrastructure in the centre to perform daily operations?
5) How secure is the equipment at the centre?
6) Is there any noticeable improvement in the delivery of services to the communities?
7) Is there an easy sharing of information between participating departments for the benefit of the community?
8) How technical is your staff regarding ICT in case of operational failures?
9) What are the key challenges experienced by the centre regarding ICT?
10) What do you think is needed by the centre to be effectively operational?

Appendix G: Interview Questions – End-Users / Citizens

University of Fort Hare
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INTERVIEW QUESTIONS – END-USERS / CITIZENS

1) How the centre was introduced to the community?
2) How easily accessible are the government services at the centre?
3) Are there any noticeable changes in the delivery of services by the centre?
4) How effective is the centre towards the delivery of services? Please explain
5) How far is the centre from the community households?
6) How secure is the centre for the use by the community?
7) Is the centre accessible to everyone (i.e. elderly, uneducated, etc)? Please explain?
8) Are there any awareness sessions between the participating departments and the community within the centre?
9) What are the challenges that are experienced by the community within the centre?
10) What do you think is needed by the community for improving the delivery of government services by the centre?

Appendix H: Interview Validation Form for Expert Panel

Criteria	Operational Definitions	Score **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				**Questions NOT meeting standard (List page and question number) and need to be revised.** ***Please use the comments and suggestions section to recommend revisions.***
		1	2	3	4	
Clarity	• The questions are direct and specific. • Only one question is asked at a time. • The participants can understand what is being asked. • There are no *double-barreled* questions (two questions in one).					
Wordiness	• Questions are concise. • There are no unnecessary words					

Negative Wording	• Questions are asked using the affirmative (e.g., Instead of asking, "Which methods are not used?", the researcher asks, "Which methods *are* used?")					
Overlapping Responses	• No response covers more than one choice. • All possibilities are considered. • There are no ambiguous questions.					
Balance	• The questions are unbiased and do not lead the participants to a response. The questions are asked using a neutral tone.					
Appropriateness of Responses Listed	• The choices listed allow participants to respond appropriately. • The responses apply to all situations or offer a way for those to respond with unique situations.					
Use of Technical Language	• The use of technical language is minimal and appropriate. • All acronyms are defined.					
Application to Praxis	• The questions asked relate to the daily practices or expertise of the potential participants.					
Relationship to Problem	• The questions are sufficient to resolve the problem in the study					

	• The questions are sufficient to answer the research questions. • The questions are sufficient to obtain the purpose of the study.					

Appendix I: Model Evaluation Form for Expert Panel

TOE Context	Operational Definitions	**Score** **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				**Context / Factor(s) missing OR not meeting standard** ***Please use this section for comments and suggestions.***
		1	2	3	4	
Technology	Technological factors affecting the effective implementation of e-government in the Thusong Service Centres					
Organisation	Organisational factors affecting the effective implementation of e-government in the Thusong Service Centres.					
Environment	Environmental factors affecting the effective implementation of e-					

	government in the Thusong Service Centres					