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Towards smart governance through a multidisciplinary approach to e-government integration, interoperability and information sharing: A case of the Labour Market Intelligence project in South Africa

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Towards smart governance through a multidisciplinary approach to e-government integration, interoperability and information sharing: A case of the Labour Market Intelligence project in South Africa.

A research dissertation submitted by

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University of the Witwatersrand

Johannesburg, South Africa

Supervisor: Professor Judy Backhouse **November 2019**

Declaration

I declare that this dissertation, submitted by me, is my own work, that I have referenced all the sources that I have used and that no part was previously submitted to any tertiary institution.

Signature ……..

Date……

Dedication

This dissertation is dedicated to my two beautiful daughters Ayanna-Rose Manda and Michaela Manda.

Abstract

The integration and interoperability of e-government systems and information sharing are pivotal in promoting the successful digital transformation of governments into "smart governments". Smart governments govern efficiently in a bid to improve the quality of life of citizens and also promote socio-economic inclusion in delivering services. Developing country governments, however, continue to face blockages in their digital transformation journeys due to a myriad of challenges which include information sharing and the integration and interoperability of e-government systems.

The aim of this study is to understand the institutional barriers to e-government integration, interoperability and information sharing with a view to improving the implementation of policy reforms that promote inclusive digital transformation. Integration, interoperability and information sharing are critical in ensuring a seamless flow of data, information, knowledge, and innovation across government to promote strategic planning, operational efficiency, better service delivery and governance. The study is multidisciplinary; it is conducted in the information systems discipline but draws from other disciplines such as political science and public administration.

The study is an interpretivist single case study of the Labour Market Intelligence Partnership Project based in South Africa, a developing country that has embraced an inclusive digital transformation agenda. Semi-structured interviews, a review of the literature and documentary evidence are used for collecting data. Thematic analysis is used to analyse evidence. Some of the key themes that emerged include collaboration, leadership, governance, power, politics, and trust, norms, regulation and information and communication infrastructure. Institutional Theory and the Circuits of Power Framework are used as the theories underpinning this study.

The two theories are appropriate for studying multidisciplinary phenomena such as e-government.

This study found that despite the development of policies, normative and other mechanisms aimed at promoting the digital transformation of government, the implementation of such reforms remains a challenge. Poor coordination and collaboration, poor leadership commitment, poor social and political cohesion, power dynamics, trust concerns, resourcing and institutionalised norms and practices that hinder transformation were some of the barriers identified. The Integration, Interoperability and Information Sharing complexity Framework is proposed for understanding the implementation of integration, interoperability and information sharing initiatives in institutions. To understand the institutionalisation of reforms in government, the Power, Politics and Institutionalisation of Information Systems Framework is proposed.

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Peer-reviewed publications

Manda, M.I. & Backhouse, J. (2018). Inclusive digital transformation in South Africa. An Institutional perspective. In *Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance, Galway, Ireland, April 2018 (ICEGOV'18)*

Manda, M. I., & Backhouse, J. (2019). Smart Governance for Inclusive Socio-Economic Transformation in South Africa: Are We There Yet? In *E-Participation in Smart Cities: Technologies and Models of Governance for Citizen Engagement* (pp. 179-201). Springer, Cham.

Manda M.I. (2017). Towards "Smart Governance" Through a Multidisciplinary Approach to E-government Integration, Interoperability and Information Sharing: A Case of the LMIP Project in South Africa. In: Janssen M. et al. (Eds) Electronic Government. EGOV 2017. Lecture Notes in Computer Science, vol 10428. Springer, Cham

Manda, M. I., & Backhouse, J. (2017). Digital transformation for inclusive growth in South Africa: challenges and opportunities in the 4th industrial Revolution. Proceedings of the 3rd African Conference on Information Systems

Manda, M. I., & Backhouse, J. (2016).Towards a "Smart Society" through a connected and smart citizenry in South Africa: a review of the national broadband strategy and policy. In *International Conference on Electronic Government and the Information Systems Perspective* (pp. 228-240). Springer, Cham.

Manda, M. I., & Backhouse, J. (2016).Addressing trust, security and privacy concerns in e-government integration, interoperability and information sharing through policy: a case of South Africa. In *CONF-IRM* (p. 67).

Manda, M.I.& Backhouse, J.(2016).Barriers to e-government integration, interoperability and information sharing in developing countries: A systematic Review of Literature, Proceedings of the 2nd African Conference on Information Systems

Acronyms

ACHPR - African Commission on Human and Peoples Rights

CIO- Chief Information Officer

DDG- Deputy Director General

DG- Director General

DHA – Department of Home Affairs

DHET – Department of Higher Education and Training

DPSA – Department of Public Services and Administration

DST – Department of Science and Technology

DTI – Department of Trade and Industry

DTPS - Department of Telecommunications and Postal Services

EA – Enterprise Architecture

ECT – Electronic Communications and Transactions

GCIO- Government Chief Information Officer

GEA – Government Enterprise Architecture

GITOC- Government Information Technology Officers Council

ICT – Information and Communication Technology

IS - Information Systems

IT- Information Technology

LMIP- Labour Market Intelligence Partnership

LMIS - Labour Market Intelligence/ Information System

MERSETA – Manufacturing, Engineering and Related Services Sector Education and Training Authority

NSDS – National Skills Development Strategy

OFO - Organised Framework of Occupations

POPI - Protection of Personal Information

PSET - Post School Education and Training

RICA - Regulation of Interception of Communication Act

SASCO - South African Standard Classification of Occupations

SET - Science, Engineering, and Technology

SITA - State Information Technology Agency

SMS - Senior Management Service

STATSSA - Statistics South Africa

TOGAF - The Open Group Architecture Framework

UN - United Nations

WP-PSET - White paper on Post-school Education and Training: Building an Expanded, Effective and Integrated Post-School System

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CHAPTER 1

INTRODUCTION

1.1 Introduction and Background

The integration and interoperability of e-government systems and information sharing have become one of the widely adopted strategies by governments in improving governance and synergies in operations so as to improve service delivery (Pardo, Nam & Burke, 2012). The importance of integration is reiterated by the United Nations which noted that "a new trend in e-government has been the evolution towards the provision of integrated public services…Along with integrated services, e-government may increasingly support policy integration and encourage the efforts of various government institutions to work more closely together" (United Nations, 2016:2). This is important as governments need to respond effectively to the needs of "smart societies" though "smart governance". Smart societies use information and communication technologies, knowledge and innovation to solve societal problems and promote socio-economic development (Gil-Garcia, 2012; Jiménez, Solanas, & Falcone, 2014).

Interoperability and integration of e-government systems have thus been identified as one of the key strategies in transforming governments into "smart government" (Jiménez, Solanas, & Falcone, 2014). Integration is thus "a key dimension characterizing smartness in government. Integration and inter-organizational information sharing in government agencies allow for better communication, response, coordination, and service provisions for citizens, making the government smarter" (Gil-Garcia, Zhang & Puron-Cid, 2016:26).

According to Jiménez, Solanas and Falcone (2014:22), “as technological advances in data gathering, processing, and management continue, our ability to move from an information society to a “smart” society will increasingly rely on improvements and expansion in technical, organizational, and other aspects of e-government interoperability”. This is a testimony to the important role the integration and interoperability of e-government systems will play in effective public service delivery (Scholl & Klischewski, 2007).

Information sharing and the integration and interoperability of e-government systems have attracted the attention of e-government researchers and dominated government agendas due to the need for governments to improve efficiency in governance and service delivery. Integration and interoperability of systems in government promotes collaboration within government and enables efficient and improved service delivery to citizens and other stakeholders (Scholl & Klischewski, 2007).

Integration, interoperability and information sharing also improve efficiency in government operations through streamlining of government processes, better communication and collaboration. Improved internal operations in government enhances the quality of services delivered (Zheng, Chen, Huang & Zhang, 2013; Gil-Garcia, Zhang & Puron-Cid, 2016). Improving Government to Government (G2G) e-government services impacts other e-government services, such as Government to Business (G2B) e-government and Government to Citizen (G2C) (Zheng, Chen, Huang & Zhang, 2013).

E-government adoption has increased in the past two decades. E-government integration, interoperability and information sharing between government entities, however, remains a complex matter (Karlsson et al., 2017). Lisboa and Soares (2014) are of the view that achieving

high levels of e-government integration and interoperability remains one of the barriers confronting e-government practitioners and managers.

According to Pardo and Burke (2008), collaboration and networking among governments agencies is still ad-hoc and inconsistent and there is little evidence of any government that has demonstrated the level of government interoperability maturity that brings together multiple policy domains in support of improving service delivery. Although this statement by Pardo and Burke is a decade old, it's still a reality for most developing countries especially in Africa who still rank low in e-government development (United Nations, 2018). There are several social, political, technological organisational factors that have been identified as barriers to the integration and interoperability of systems in government (Scholl & Klischewski, 2007; Lam, 2008; Gianni & Gotzamani, 2014; Karlsson et al., 2017).

Governments are experiencing challenges in improving their levels of e-government maturity due to integration and interoperability challenges (Lam, 2008; Pardo, Nam & Burke, 2012). Moreover, systems integration "increases in complexity when there are legacy systems and when people are an integral part of the system" (Madni & Sievers, 2014:1). Studies in e-government interoperability maturity conducted by Gottschalk (2009) concluded that over time the provision of seamless information and service delivery to e-government users is highly complex across several dimensions of e-government.

The South African government is no exception in that the e-government integration and interoperability challenges have been highlighted as a major constraint in achieving efficiency in government (Department of Telecommunications & Postal Services, 2015b). South Africa has identified digital transformation of government as an important cornerstone in leveraging

“the benefits of the digital society and knowledge-based society” South Africa, 2017:20). The digital transformation agenda has however been compromised by challenges in integrating and interoperating e-government systems and information sharing among other things.

The Department of Higher Education and Training (DHET), for example, reported that the absence of ‘integrated information systems’ across government departments and agencies has compromised the sharing of data and information (Department of Higher Education & Training, 2012). This affects planning and collaboration in delivering national goals such as the development of skills for supporting inclusive economic growth (Department of Higher Education & Training, 2012). The lack of integrated e-government systems has compromised efforts to develop “a credible institutional mechanism for skills planning that provides credible information and analysis with regards to the supply and demand for skills” (Department of Higher Education & Training, 2012:1). Poor integration and interoperability of government systems has compromised e-government progression in South Africa (Department of Telecommunications & Postal Services, 2015b).

In 2012, the South African government initiated the Labour Market Intelligence Partnership (LMIP) project for establishing a Labour Market Information System (LMIS) to build “a credible institutional mechanism for skills planning” South Africa, 2012:4). A “credible institutional mechanism consists of a coordinated combination of processes, institutional structures, technological infrastructure and human capacity, designed to achieve common policy goals” (Human Sciences Research Council, 2014:1).

A review of the literature revealed that the majority of studies in e-government integration and interoperability, and smart governance were conducted in developed countries with few in

developing country contexts. There is little evidence of a significant number of such studies being conducted in Africa. This is a gap in the literature as the political, economic and social context in developing economies, especially in Africa differs from that of developed economies. Europe, for example, as evidenced by the adoption of the European Interoperability Framework (EIF) is already at an advanced stage of interoperability, looking at government to government interoperability whereas in Africa the issue of integration and interoperability at such higher levels is still far-fetched due to some of the underlying social, political and economic development issues Africa is battling with. This research, therefore, seeks to close this gap identified in the literature by conducting this study in South Africa, which is in a developing country context.

The South African government has developed regulative and normative mechanisms such as policies, legislation, structures, norms, and standards to promote e-government integration, interoperability and information sharing. The reality, however, is that little integration and interoperability has been achieved (Department of Higher Education & Training, 2012). The Integrated ICT Policy discussion paper of 2015 also highlighted that little integration and interoperability has taken place despite efforts by the State Information Technology Agency (SITA) to implement interoperability standards among other things (Department of Telecommunications & Postal Services, 2015b).

1.2 Definition of terms

The following key definitions are adopted in this study:

- **Smart government** is "the intelligent and adaptive office authority, or function of governing" (Scholl & AlAwadhi, 2016:23).

- **Smart governance** is defined as "The capacity of employing intelligent and adaptive acts and activities of looking after and making decisions about something" (Scholl & AlAwadhi, 2016:23).
- **Integration** is defined as "the forming of a larger unit of government entities, temporary or permanent, for the purpose of merging processes and/or sharing information" (Scholl & Klischewski, 2007:897).
- **Interoperability** is "the ability of independent systems and processes (technical and non-technical) to exchange data and information and communicate using common standards to enhance efficiency and service delivery". The definition is adopted from Dos Santos & Reinhard (2012:72) who define interoperability as "the ability of a system or process to use information and/or functionality of another system or process through the adherence to common standards".
- **Information sharing** is defined as the exchange of information between organisations or granting organisations in the same network access to information (Dawes, 1996).
- **Institutions** comprise of "regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott, 2014:56). Regulative elements in the context of this thesis refer to policy and legislation shaping the institution. Normative elements on the other hand refer to norms and standards while cultural-cognitive elements refer to belief systems and values shaping institutions.

1.3 Problem statement

The integration and interoperability of information systems and information sharing in government has captured the attention of governments and e-government researchers due to increased pressure for governments to improve service delivery through smart governance. Integration and interoperability promote collaboration and efficiency in service delivery

(Scholl & Klischewski, 2007). Institutional barriers confronting governments in integrating and interoperating their systems have hindered their progression to higher levels of government maturity characterised by improved service delivery, efficiency and governance (Lam, 2005; Pardo & Burke, 2008; Novakouski & Lewis, 2012). Despite the significant growth of e-government in the past decade, gaps in our understanding remain. Literature has been published around the adoption and use of e-government services. The complexity of governments as rigid institutions in the institutionalisation of information systems or innovation, calls for further research to understand these complex institutions. There are few studies in the developing country context that have used the institutional perspective and the role of power and politics in understanding challenges in government, such as barriers to information sharing, interoperability and integration.

1.4 Purpose of the study

The aim of this research is to understand institutional barriers to integration, interoperability and information sharing using a multidisciplinary perspective, and Institutional Theory and the Circuits of Power Framework as lenses. This is critical in improving the integration and interoperability of e-government systems for improving efficiency, coordination, planning and governance.

The multidisciplinary approach in studying e-government integration and interoperability is necessitated by the "complexity of e-government-related problems and phenomena themselves, which greatly exceeds the scope of any single academic discipline" (Scholl, 2008:36). This view is reiterated by Heeks and Bailur (2007:245) who argued that "both intellectually and practically, e-government raises issues of information, technology, and politics that neither of its main referent fields – information systems and public administration – are individually well equipped to deal with".

This study is conducted in the information systems discipline but also relies on other e-government related disciplines such as political science and public administration to provide useful lenses to understand the phenomena. Each discipline contributes a useful lens for studying integration, interoperability, information sharing in the context of smart governance.

Van den Besselaar and Heimeriks (2001:706) distinguish between multidisciplinary, interdisciplinary and transdisciplinary research. They argue that:

- "In multidisciplinary research, the subject under study is approached from different angles, using different disciplinary perspectives. However, neither the theoretical perspectives nor the findings of the various disciplines are integrated" (Van den Besselaar and Heimeriks, 2001:706).
- "An interdisciplinary approach, on the other hand, creates its own theoretical, conceptual and methodological identity. Consequently, the results of an interdisciplinary study of a certain problem are more coherent and integrated. Interdisciplinary approaches are characterized by an explicit formulation of a uniform, discipline-transcending terminology or a common methodology" (Van den Besselaar and Heimeriks, 2001:706).
- "A transdisciplinary approach goes one step further, as it is based upon a common theoretical understanding, and must be accompanied by a mutual interpenetration of disciplinary epistemologies. In this view, a transdisciplinary field has a homogenized theory or model pool" (Van den Besselaar and Heimeriks, 2001:706).

E-government research is considered multidisciplinary because it applies information systems, management, public administration and other domains (Belanger & Carter, 2012). A multidisciplinary approach is adopted in this study to understand how the different disciplinary

perspectives have approached the problem being investigated. This is important in understanding multidisciplinary phenomena such as e-government.

1.5 Main research question

This study seeks to answer the following research question:

How can we understand institutional barriers and the effectiveness of mechanisms in integration, interoperability and information sharing, in order to promote the digital transformation of governments to smart governments that are responsive to the smart society?

1.5.1 Objectives

The objectives of the study are as follows:

1. To **analyse** institutional barriers preventing the effective implementation of institutional mechanisms (regulative, cultural-cognitive and normative) aimed at institutionalising the desired behaviour in the transformation of political and social institutions.
2. To **explore** the institutional mechanisms implemented by goverments to promote integration, interoperability and information sharing in support of a digital transformation and smart governance agenda.
3. To **analyse** and **explain** how Institutional Theory and the Circuits of Power Framework aid our understanding of the digital transformation of political and social institutions such as government.

1.5.2 Research sub-questions

In order to achieve the objectives of this study, the following sub-questions shaped this study:

1. What institutional barriers do governments face in trying to improve information sharing, integration and interoperability of systems?

2. What institutional mechanisms do governments implement to address barriers to integration, interoperability and information sharing?
3. How do Institutional Theory and the Circuits of Power Framework aid our understanding of the digital transformation of complex political and social institutions?

1.6 Research methodology

This study assumes an interpretive paradigm as it seeks to generate an understanding of the social, political, technological, environmental and economic context inherent in e-government integration and interoperability research. The phenomena being investigated in this study as reflected in the research question calls for the need to "understand the context" as Walsham (1993:4) puts it. The interpretive paradigm allowed the researcher to gain a rich insight into the complex relationships and issues surrounding e-government integration and interoperability. Interpretive researchers interpret their own understanding of phenomena. The "principle of objectivity" popular in positivist studies was therefore not be applied in this study.

This study employs the qualitative approach defined by Kothari (2009:3) as the "the subjective assessment of attitudes, opinions and behaviour and generates results in non-quantitative form or in the form which is not subjected to rigorous quantitative analysis." The research paradigm or philosophy, research goal and subject, research questions, researcher's experience, and personal beliefs arguably play a major role in influencing the choice of research approach (Denzin & Lincoln, 1994; Gupta & Mukhopadhyay, 2014). The purpose of the study and the nature of the research questions in this study demanded a qualitative approach. A qualitative approach was relevant in analysing and understanding the complex economic, technological, organisational and political context in e-government.

Qualitative research relies on non-numeric data, unlike quantitative research that relies on numerical and statistical data (Bhattacherjee, 2012:103). The use of the qualitative approach in information systems (IS) is supported by Myers (1997) who argues that "as the focus of information systems research shifts from technological to managerial and organizational issues, qualitative research methods become increasingly useful". The principal focus of the information systems discipline thus remains the "relationship between technology and organizational change" (Plummer, 2001:2). Organisational change requires an understanding of soft issues such as culture and human behaviour which are often not easy to assess using quantitative methods.

An interpretive case study research design was used as the primary method of inquiry in this study. An Interpretive case research is an "inductive technique where evidence collected from one or more case sites is systematically analysed and synthesised to allow concepts and patterns to emerge for the purpose of building new theories or expanding existing ones" (Bhattacherjee, 2012:97). The need to understand organisational and social issues such as culture and behaviour in information systems has contributed to the growth of the popularity of the case study method (Walsham, 1995; Plummer, 2001).

The case study research design allowed for the intensive study of e-government phenomenon over time within its natural setting and allowed for the use of several data collection methods. Documents, interviews, peer-reviewed literature and secondary data were used to collect data about the phenomena being studied (Kothari, 2009 & Bhattacherjee, 2012).

The case study method was chosen as it is deemed appropriate for studying and understanding complex issues and can be used to build knowledge or reinforce findings from previous studies

(Baxter & Jack, 2008; Kothari, 2009). E-government integration and interoperability remain a complex phenomenon. This justified the use of the case study in this study. Plummer (2001:3) notes that the case study method is appropriate in information systems research "because of its usefulness in investigating the relationship between information systems and such intangible concepts such as organizational performance and success".

One of the outcomes of this study was to contribute to building theory and contribute new knowledge in information systems and e-government. The case study is appropriate in building new theory or where theory is in the early formative stages (Yin, 2009). E-government research has been described as a field in its developmental stages which often lacks theory (Yildiz, 2007, Heeks & Bailur, 2007). Contributing to theory was therefore fundamental in this study.

Data collection was an important step in gathering evidence to help answer research questions in this study. Complex phenomena are better understood by using evidence from various sources. Semi-structured interviews, documents and peer-reviewed literature were thus used for collecting the data used in this study. Triangulation minimised the exclusion of relevant data.

Semi-structured interviews also known as focused or guided interviews, were used for gathering primary evidence in this study. Semi-structured interviews "focus attention on the given experience of the respondent and its effects" (Kothari, 2009: 98). Semi-structured interviews have been praised for providing rich information and insights into complex issues especially where people are involved as they allow the researcher to probe issues that may not have been obvious (Blaxter, Hughes & Tight, 2006).

Documentary evidence was also used in this study. Policy, legislation, and government strategy documents addressing issues of e-government interoperability, integration and other issues being probed in this study were analysed. Issues central to e-government interoperability such as policy innovation and trust were investigated. In addition, the evidence was sought of how institutional mechanisms such as legislation, regulation, and norms have influenced interoperability and how these can be used to understand the barriers.

Documents often contain rich data and information which might shed more light on the primary evidence collected (Blaxter, Hughes & Tight, 2006). Documentary analysis using Institutional Theory and the Circuits of Power Framework provided evidence of some of the issues at the centre of this study such as policy and legislative reforms, norms and standards and institutional structures.

Judgmental sampling or purposive sampling was used for selecting the relevant organisations and key informants to participate in this study as the author knew the potential participants. Six (6) government departments and fourteen (14) interviewees participated in this study.

The goal of qualitative data analysis was to understand phenomena and gain insights rather than explaining or predicting phenomena (Bhattacherjee, 2012; Suter, 2012). Data collection and data analysis were done concurrently. This is important in identifying gaps in the collected data (Bhattacherjee, 2012; Suter, 2012). This allowed the researcher to collect all the relevant data to ensure accurate results. Notes were made during the data collection stage as written notes help guide the researcher in conceptualising issues that address the problem and answer research questions (Suter, 2012). The role of qualitative data analysis is thus to understand and

make sense of phenomena and to uncover emerging themes, patterns, and insights rather than predicting or explaining (Bhattacherjee, 2012; Suter, 2012).

Thematic analysis was used in data analysis in this study. It "is a general approach to analysing qualitative data that involves identifying themes or patterns in the data" (Wagner, Kawulich & Garner, 2012:232). Coding of interview and documentary data was done to categorise evidence for easy analysis. The study used both closed (deductive) coding and open (inductive) coding. Deductive coding was used to identify themes emerging from theory and literature. Inductive coding, on the other hand, was used to identify new themes that emerged during the collection and analysis of data. Throughout data collection and analyses various themes emerging from this study were identified and unique codes were assigned.

1.7 Theoretical contribution

This study proposes two frameworks. First, it proposes the Integration, Interoperability and Information Sharing complexity Framework. The framework provides a theoretical basis to understand the complexity and some of the barriers to integration, interoperability and information sharing. The proposed framework drew inspiration from the Circuits of Power Framework, Scott's Three Pillars Framework, Tolbert and Zucker's Institutionalisation Process Framework, and Silva and Backhouse's Institutionalisation of Information Systems Framework. The proposed framework is a result of an extensive review of the literature in Chapter 2 and theory in Chapter 3, further informed by the analysis conducted in this study.

The study also proposes the Power, Politics and Information Systems Institutionalisation Framework. The proposed framework drew inspiration from the Circuits of Power Framework, Scott's Three Pillars Framework, Tolbert and Zucker's (1996) Institutionalisation Process Framework and Silva and Backhouse's Institutionalisation of Information System Framework.

The proposed Power, Politics and Information Systems Institutionalisation Framework highlights the relationship between the circuits of power, institutional isomorphism and the institutionalisation process in institutions. It highlights how the three circuits of power (episodic, social integration and systematic integration) play a complementary role in the institutionalisation process.

The proposed theories highlight the critical role regulative, normative and cultural-cognitive elements play in the institutionalisation process. The proposed theories also highlight the role of isomorphic pressures during the institutionalisation process or organisational change.The two theories differ in that the Integration, Interoperability and Information Sharing Complexity Framework provides a theoretical basis to understand the complexity and some of the barriers to integration, interoperability and information sharing. The Power, Politics and Information Systems Institutionalisation Framework on the other hand highlights the relationship between the circuits of power, institutional isomorphism and the institutionalisation process in institutions.

One of the weaknesses in e-government research is the fragmentation of the body of knowledge which remains scattered across various disciplines that include information science, computer science, management and public administration (Scholl, Mai & Fidel, 2006; Scholl & Klischewski, 2007). Despite calls by Scholl & Klischewski (2007) for e-government researchers to approach e-government interoperability from a multidisciplinary perspective, the adoption of multidisciplinary approaches has been slow. The multidisciplinary approach in this study assists in applying the various perspectives in studying e-government integration and interoperability. This is critical in understanding the complex political, socio-technical, technological, organisational and economic factors common in e-government.

The focus on Government to Government (G2G) e-government in this study is also set to narrow the gap in e-government literature which is currently dominated by Government to Citizen (G2C) e-government. This is important as previous studies have shown that G2G efficiency impacts on G2C and G2B operations which consequently make the whole public service delivery system more effective and efficient (Zheng, Chen, Huang & Zhang, 2013).

The use of more than one theory in understanding complex phenomena such as the institutionalisation of new information systems in complex institutions such as government has become widely accepted in the information systems field (Silva & Backhouse, 2007). This is largely due to some of the shortcomings of using one theory as a lens to understand multidimensional issues. The use of two or more theories thus provides an opportunity to extend theory by exploring phenomena from various lenses in one study. In this study, I applied Institutional Theory and the Circuits of Power Framework by adopting concepts from both in understanding and explaining phenomena such as power dynamics and the role of politics in the institutionalisation of reforms, and deinstitutionalisation of institutionalised practices that constrain transformation. New institutional theory, for example, has been criticised for de-emphasising deinstitutionalisation of institutionalised practices in the transformation of institutions as a result of technology disruptions, social upheaval or regulatory reforms (Kholeif, Sherer & Abdel-Kader, 2008). The Circuits of Power Framework on the other hand "integrates several different concepts of power to account for the process of institutionalization" (Silva & Backhouse, 2007:297).

The study of e-government or information systems in public institutions requires an understanding of organisational, technological, political and social issues. This called for the

adoption of a multidisciplinary lens in understanding complex phenomena in the transformation of institutions. Three disciplinary perspectives were used in this study:

(i) Information systems - The information systems perspective was used to understand organisational issues such as culture, inter-organisational relations, trust, processes, structures and other issues that impact integration, interoperability and information sharing.

(ii) Political science - The political science perspective was used to understand how politics and power dynamics in institutions and the actors behind them impact their transformation.

(iii) Public administration - The public administration perspective was used to understand governance, leadership and policy issues in the digital transformation of government.

The choice of theory also reflects the multidisciplinary approach. Institutional theory, for example, is a multidisciplinary theory with disciplinary foundations in political science, sociology, and economics (Scott, 2014). It has also been adopted in information systems research. The Circuits of Power Framework also has its foundation in political science and organisational behaviour but has also been widely adopted in other disciplines including information systems as reflected in studies such as Markus (1983), Silva and Backhouse (2003) and Silva (2007).

The proposed Power, Politics and Information Systems Institutionalisation Framework and Integration, Interoperability and Information Sharing Complexity Framework also reflects a multidisciplinary perspective in understanding phenomena such as the institutionalisation of information systems. The framework highlights the relationship between the circuits of power,

institutional isomorphism and the institutionalisation/ deinstitutionalisation process in institutions.

A review of literature revealed that the body of knowledge in these two disciplines are dominated by literature from developed countries. This is a gap in the literature as the political, economic and social context in developing economies, especially in Africa differs from that of developed economies. This study contributes to narrowing this gap as it is conducted in South Africa, a developing country in Africa that has adopted the digital transformation agenda. Understanding the context is key in interpretive research and therefore "contextual contribution" in theory is important in building the e-government and information systems body of knowledge.

1.8 Practical contribution

This study produced knowledge that can be applied when developing integrated e-government systems for enhancing governance, efficiency and service delivery which is pivotal in the development of a smart society. The study contributes new knowledge that can help governments and e-government practitioners in understanding issues such as governance, leadership, and policy and strategy development in e-government. Findings in this study can be used by other developing countries with a similar context with South Africa.

This study has implications for the practice of e-government or information systems in the public sector. The study makes recommendations to policymakers as they have a significant role to play in the institutionalisation of reforms. Policymakers are responsible for setting up government priorities and developing regulations to support these priorities. Policymakers are also responsible for developing mechanisms such as structures for supporting the implementation of policy reforms. Some of the recommendations include putting in place

mechanisms to monitor implementation, clarifying the roles of key players, aligning structures to policies and legislation, and resourcing among other things.

The study also makes recommendations to policy implementers as they are responsible for implementing government policy and national priorities through government departments and their agencies. The Senior Management Services echelon composed of Directors, Chief Directors, Deputy Director Generals and Director Generals in government departments are responsible for overseeing the implementation of policies and national priorities. Some of the recommendations include collaboration in the implementation of policy reforms, building trusting relations and improving citizen engagement and participation.

1.9 Scope of the study

The study is conducted in South Africa and focuses on e-government information systems integration, interoperability and information sharing among national government departments forming part of the Labour Market Intelligence Partnership (LMIP). The provincial government and local government departments were excluded from this study as the focus of the study is integration and interoperability at national government level. The role of other actors such as the State Information Technology Agency (SITA) and Government Information Technology Officers Council (GITOC) was also investigated.

This study investigated other relevant issues which have an impact on government initiatives because of the multidisciplinary approach. Policy, legal, political, leadership, organisational, social, inter-organisational relations, strategic management, and governance issues were some of the issues investigated in this study in addition to technology. These issues were studied in the multidisciplinary context of e-government and the information systems discipline.

1.10 Case description

South Africa is a middle income developing country in Sub-Saharan Africa. It has embraced the digital transformation of government agenda and is ranked amongst the top in Africa in e-government development (United Nations, 2016). South Africa's digital transformation journey can be traced back to 1995 when the then Deputy President, former President Thabo Mbeki led the South African delegation to the World Summit on Information Society (WSIS). The digital transformation of government has been identified as one of the three pillars of building an inclusive digital society by 2030. Digital access and digital inclusion are the other two pillars

Despite the development of policies and legislation, standards and norms, challenges still remain in the digital transformation journey. E-government integration and interoperability and information sharing remain a stumbling block to South Africa's digital transformation journey. This is a serious threat to the government's bid to transform into a smart government that is efficient in governing the smart society.

The Labour Market Intelligence Partnership (LMIP) project is a practical example of government's attempt to improve governance, operational and strategic efficiency, and service delivery through collaboration, information sharing and the integration and the interoperability of e-government systems. The LMIP project was conceptualised as government's response to outcome five (5) of the government's twelve (12) strategic priorities. The goal of the project is to "develop a credible institutional mechanism for skills planning in South Africa in support of Outcome 5 by integrating systems to increase the reliability of data for better planning and implementation of skills development for promoting inclusive growth". (Department of Higher Education & Training, 2012:2). This is a practical case of a government using the integration

and interoperability of information systems and information sharing to promote efficiency and collaboration in government planning, operations, service delivery, and governance. The case is a revelatory case. According to Yin (2009:43), single case studies are useful where "the case is considered revelatory, where the researcher has an opportunity to observe and analyse a phenomenon previously inaccessible to social science inquiry".

1.11 Overview of chapters

Chapter 1: Introduction

This chapter gives the background to the problem being investigated. This chapter also highlights the purpose of the research, the research objectives and the research questions that will be answered by this research. This chapter also gives an overview of the research methodology used in this study. The scope, theoretical and practical contributions of the study are also covered in this chapter

Chapter 2: Review of literature

This chapter reviews and synthesises the literature on e-government integration, interoperability and information sharing from across various e-government related disciplines such as information systems, information science, political science and public administration. The chapter is divided into three sections, the first section defines smart governance, e-government integration, interoperability and information sharing. The second section discusses institutional barriers to e-government integration, interoperability and information sharing. The third section discusses government enterprise architecture, interoperability frameworks and standards as some of the measures for addressing integration, interoperability and information sharing challenges.

The aim of this chapter is to establish a link between this study and previous studies so as to show how the study will contribute to the existing body of literature. A review of the literature

brings clarity and helps to conceptualise the problem of e-government integration, interoperability and information sharing.

Chapter 3: Theoretical framing

This chapter establishes a theoretical background for the study. It introduces a discussion on the development and use of theory in information systems so as to assist in conceptualising the problem being investigated within existing theory. Institutional Theory and the Circuits of Power Framework which underpin this study are discussed with the aim of bringing out their value and application in this study and in information systems and e-government research in general. The main aim of this chapter is to frame this study within the existing theory so as to increase rigour in a bid to produce new knowledge that is of intrinsic value to the information systems and e-government research community.

Chapter 4: Research methodology

The chapter discusses research philosophies or paradigms used in information systems research and justifies the choice of paradigm used in this study. The research approach and design, data gathering techniques and population sampling techniques used in conducting the study are also discussed with the aim of justifying their relevance in addressing the problem. The data analysis technique used to make sense and understand phenomena is also discussed.

Chapter 5: State of e-government in South Africa

The purpose of this chapter is to assess the current state of e-government in South Africa.

The focus is on policy actions, decision making, leadership, coordination and implementation programmes, allocation of resources and activities in government. The influence of the political, socio-technical, socio-historic and socio-cultural factors in the development and implementation of policy and how these have impacted the success thereof are also discussed.

Chapter 6: The Labour Market Information System case study and context

The purpose of this chapter is to describe the LMIP project and discuss factors that have impacted the implementation of a Labour Market Information / Intelligence System (LMIS) in South Africa with a focus on the integration and interoperability of information systems, and information sharing. The LMIP project is used as a revelatory case to understand issues confronting the South African government in its bid to integrate and interoperate its systems as part of its digital transformation and smart governance agenda. It is a practical case study of issues confronting the government in its bid institutionalise reforms aimed at promoting transformation. It is also used as the context for understanding integration, interoperability and information sharing in the South African national government.

Chapter 7: Discussion and analysis of results

This chapter seeks to understand institutional barriers to integration, interoperability and information sharing in government that are preventing the digital transformation of government. Here the data is presented and analysed. This chapter provides a basis for drawing conclusions and proposing recommendations in chapter 8. In understanding e-government integration, interoperability and information sharing issues in South Africa, Institutional Theory and the Circuits of Power Framework are used as frameworks of analysis.

Chapter 8: Conclusions and recommendations

This chapter draws conclusions to this study from the findings in the previous chapters (Chapter 2, Chapter 4, Chapter 5, Chapter 6 and Chapter 7). The conclusions drawn respond to the purpose of the study. This chapter also highlights the theoretical and practical contribution of this study to the information systems and e-government discipline. In contributing to practice, this chapter also gives recommendations to strengthen policy-making and implementation. This chapter responds to the research questions that shaped this study.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

This chapter reviews and synthesises the literature on e-government integration, interoperability and information sharing from across various e-government related disciplines such as information systems, information science, political science, and public administration. The chapter is divided into three sections, the first section defines smart governance, e-government integration, interoperability and information sharing. The second section discusses institutional barriers to e-government integration, interoperability and information sharing. The third section discusses government enterprise architecture, interoperability frameworks and standards as some of the measures for addressing integration, interoperability and information sharing challenges.

2.2 Aim

The aim of this chapter is to establish a link between this study and previous studies so as to show how the study will contribute to the existing body of literature (Cronin, Ryan & Coghlan, 2008; Kumar, 2011). This review of the literature is also conducted so as to bring clarity and to conceptualise the problem of e-government integration, interoperability and information sharing.

2.3 Background

Integration, interoperability and information sharing in e-government has attracted the attention of e-government researchers and dominated government agendas over the past two decades due to the increased pressure for governments to improve service delivery, efficiency and governance. The integration and interoperation of e-government systems, processes, information, physical infrastructure and institutions to strengthen governance and services

delivery are pivotal in transforming governments into smart governments (Gil-Garcia, 2012). The integration and interoperability of systems in government strengthens collaboration within government (Scholl & Klischewski, 2007). According to Pardo, Nam & Burke (2012:17), "interoperability is not an end in itself but an enabler for helping government use technology to improve government services and operations. Citizens do not demand interoperability; rather, systems must be interoperable to effectively meet citizens' demands". Interoperability improves communication, governance and administrative efficiency which impacts the quality of service delivery to citizens and other stakeholders (Zheng, Chen, Huang & Zhang, 2013). Government to Government (G2G) efficiency impacts other e-government services, such as Government to Business (G2B) and Government to Citizen (G2C) e-government (Zheng, Chen, Huang & Zhang, 2013).

2.4 Smart government

Countries around the world are embarking on initiatives to transform to smart governments that deliver better services to citizens. Integration is "a key dimension characterizing smartness in government. Integration and inter-organizational information sharing in government agencies allow for better communication, response, coordination, and service provisions for citizens, making the government smarter" (Gil-Garcia , Zhang & Puron-Cid, 2016:26).

Smart government and related concepts such as smart cities are still fairly new concepts and e-government scholars and practitioners have not agreed on what smart government entails. "There is still an open discussion between scholars and researchers of electronic government regarding what smart government entails and how it should be defined" (Gil-Garcia Helbig & Ojo, 2014:16). The concept of a smart city, for example, which can be described as a form of smart government is still problematic "due to its definitional impreciseness, numerous unspoken assumptions and a rather self-congratulatory tendency" (Hollands, 2008:303). Some

of the definitions of smart government focus on the use of technologies by governments. For example, smart government is characterised by Gil-Garcia, Mellouli, Luna-Reyes and Zhang (2014:1) as "the extensive use of technology by governments". Other definitions focus on the use of technologies to improve the functioning of government. Smart government has thus been characterised as those "activities that creatively invest in emergent technologies coupled with innovative strategies to achieve more agile and resilient government structures and governance infrastructures" (Gil-Garcia, Helbig & Ojo, 2014:11). Other definitions emphasise the use of information and communication technologies in service delivery, such as:

- A government that "integrates information sources of multiple departments and multiple business system functions on a large scale, and then provides the on-demand dynamic portfolio smart services" (Du & Qin, 2014:625) and;
- "A government that uses sophisticated information technologies to interconnect and integrate information, processes, institutions, and physical infrastructure to better serve citizens and communities" (Gil-Garcia, 2012:274).

The application of the idea of "Smart Cities in Africa" has been critiqued for emphasising technology without concern for consequences; particularly where it leads to increasing inequity and exclusion (Backhouse, 2015; Watson, 2015). In this study, smart government will be defined less in terms of technology, and more in terms of the long-term societal goals of equity, equality, and social justice, with digital technologies playing a role in achieving that goal. In keeping with the "social and human" emphasis found in the literature on Smart Cities (Hollands, 2008: 309), the following definition is proposed: "Smart government is the use of technology, knowledge, innovation and other tools to transform the government for effective internal functioning, governance and service provision, in the pursuit of social, political and economic inclusion of all citizens for the long-term development of the country." This

definition is more in line with that of Scholl and AlAwadhi (2016:23) who define smart government less in terms of technology, proposing that "smart government" is "the intelligent and adaptive Office, authority, or function of governing".

The role of technology in governing, however, cannot be downplayed (Scholl & AlAwadhi, 2016). In the 4th industrial revolution, advanced technologies such as sensor networks, data analytics, artificial intelligence, and robotics can certainly make governments "smarter" by aiding efficiency, decision making, information sharing, transparency, accountability and efficient service delivery.

The attempt to define smart government in this study is not to add to the confusion surrounding its definition but rather to spark a meaningful academic debate which is critical in the production of new knowledge. A decade ago the reality might have been that the concept of "smart" was vague but realities as we know them change. Developments in the past decade point to the concept of "smart government" and its associated concepts such as "smart cities" as a new reality. Rapid urbanisation, the pressure for governments to find innovative ways to address inequality, growth in the use of advanced technologies such as data analytics, blockchain, artificial intelligence and robotics have made smart governments, smart cities and smart society a reality. Information systems researchers can therefore not ignore this reality. With autonomous cars and other developments such as robotic surgery becoming a reality and no longer science fiction in the 4th industrial revolution, governments have no choice but to become "smart" in order to effectively govern the smart society.

2.4.1 Smart governance

Achieving smart governance through e-government integration and interoperability, among other things, has presented a new challenge of governing the complex "smart" environment.

Smart governance is defined as "ensemble of principles, factors, and capacities that constitute a form of governance able to cope with the conditions and exigencies of the knowledge society" (Wilke, 2007: 165). It has also been defined as "The capacity of employing intelligent and adaptive acts and activities of looking after and making decisions about something" (Scholl & AlAwadhi, 2016:23). In this study, we adopt the definition by Scholl and AlAwadhi (2016) due to its neutrality and less emphasis on technology so as to keep in line with the lens used in this study.

Smart governance can help facilitate interactions between government, citizens, and business and to improve stakeholder participation in policy making, governance and other democratic processes that improve accountability, transparency and decision-making (Scholl & Scholl, 2014). Collaboration and citizen participation in transparent decision-making promotes smart governance (Chourabi et al., 2012; Scholl &AlAwadhi, 2016).

Chourabi et al. (2012) proposed a set of smart governance factors. Scholl and Scholl (2014) also proposed some research themes of smart governance. Leadership and Governance, Collaboration, and Information and Communication Infrastructure are some of the recurring themes identified in the two frameworks which are compared in Table 1. Understanding regulative and normative elements such as policies and norms is essential in promoting ethical leadership, accountability and transparency as some of the key anchors of smart governance. Understanding cultural-cognitive elements, such as organisational practices and skills, is also key in driving collaboration and participation, an important factor in smart governance. Understanding developments in ICT and information sharing behaviour is also critical in addressing communication, data exchange and service and application integration issues in smart governance.

Table 1: Factors and pillars of smart governance	
Factors of [smart] governance (Chourabi et al., 2012:2292)	**Research themes in Smart Governance (Scholl & Scholl, 2014:169)**
Theme: Leadership and governance	
Leadership and champion	Policies Norms
Accountability	
Transparency	
Theme: Collaboration	
Collaboration	Practices Skills
Participation and partnership	
Theme: Information and Communication Infrastructure	
Service and application integration	ICT Information sharing
Communication	
Data-exchange	

After an extensive review of the literature on smart government, Gil-Garcia, Zhang and Puron-Cid (2016) proposed 14 dimensions of smart government (Figure 1). According to Gil-Garcia, Zhang and Puron-Cid (2016:524), "Public managers do not control all dimensions equally. Some dimensions could be seen as relatively direct outputs of their actions, while others could be better understood as outcomes that could be affected, but not solely determined, by strategic interventions or deliberate actions". Integrated government is identified as a key output of smart government that lead to desire outcomes such as effective, efficient and equitable government as illustrated in Figure 1.

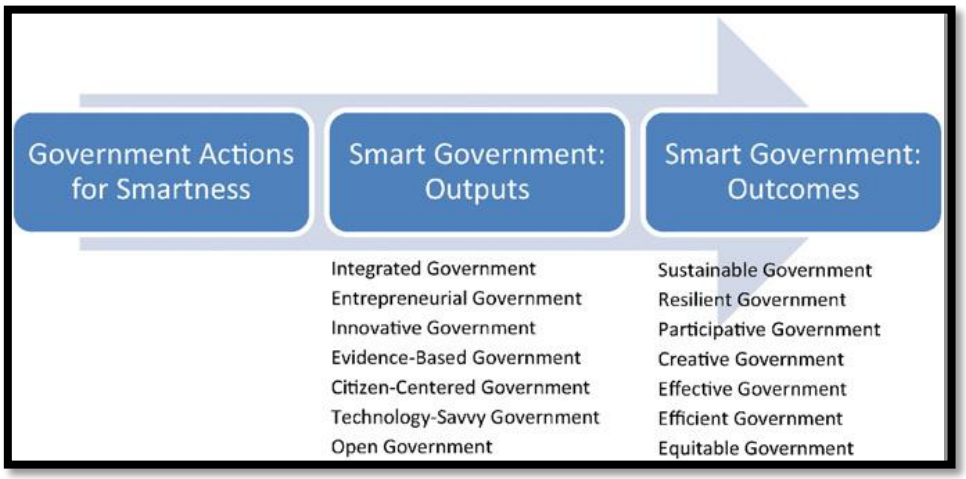

Figure 1: Public managers' actions and smart government outputs and outcomes (Gil-Garcia, Zhang & Puron-Cid, 2016:532)

2.5 Defining and understanding e-government integration

Scholl and Klischewski (2007:897) define government integration as "the forming of a larger unit of government entities, temporary or permanent, for the purpose of merging processes and/or sharing information". Integration thus focuses on the governance and non-technical issues of intra-government and inter-government collaboration (Scholl, Kubicek, Cimander & Klischewski, 2012). Integration is concerned with "forming a coherent whole from component subsystems (including humans) to create a mission capability that satisfies the needs of various stakeholders" (Madni & Sievers, 2014:39). From these definitions, it is clear that integration is underpinned by intra-governmental collaboration, standardisation, streamlining of processes and systems and information sharing with the goal of increasing operational efficiency and service delivery to satisfy stakeholders. Various models have been proposed to measure e-government integration maturity. These are discussed in the next sub-section.

2.5.1 The Layne and Lee model

One example of an e-government maturity model that is widely referenced is the Layne and Lee model which is one of the first maturity models to identify the importance of integration. The Layne and Lee Model proposes four stages of growth for e-government integration. The four stages explain the degree of complexity involved in each level of integration, these include; (1) cataloguing, (2) transaction, (3) vertical integration, and (4) horizontal integration. In the cataloguing stage, governments are focused on establishing their online presence by cataloguing government information and making it available online. The transactional stage as described by Layne and Lee (2001:128) is "the beginning of the e-government as a revolutionary entity changing the way people interact with their government". The transactional stage thus focuses on enabling online transactions between the government and its citizens, systems, however, remain decentralised and fragmented. Vertical integration

focuses on the transformation of government services. It involves the connecting of local systems to higher level systems within similar functionalities. The last stage, horizontal integration involves the integration of systems across different functionalities to create a "one-stop shop" for citizens.

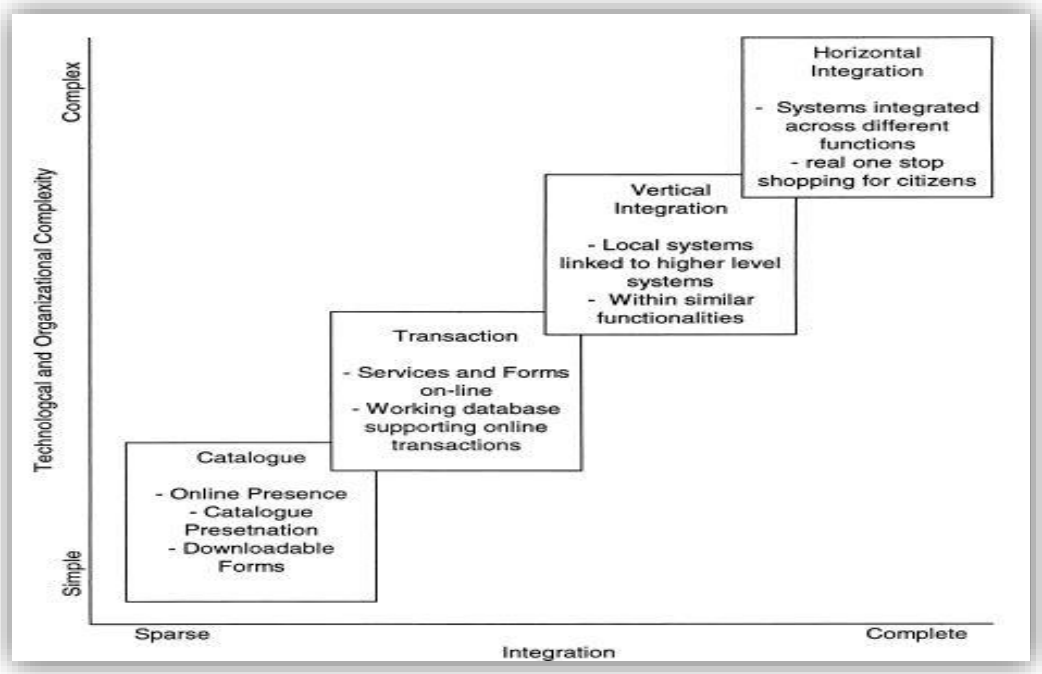

Figure 2: E-government maturity model (Layne and Lee, 2001:124)

2.5.2 E-government maturity models

There are several other e-government models that highlight the various stages of e-government development. Integration is considered an important and advanced stage of e-government development. Table 2 summarises some of the maturity models, highlighting where each model positions integration in e-government maturity.

Table 2: E-government maturity models highlighting integration					
	STAGE 1	**STAGE 2**	**STAGE 3**	**STAGE 4**	**STAGE 5**
Hiller & Belanger Maturity Model (2001)	Information	Two way communication	Transaction	**Integration**	Participation
Wescott Maturity model (2001)	Setting up email systems and internal network	Enabling inter-organisational and public access to information	Allowing two-way communication	Digital democracy	**Joined up government (integrated)**
Moon Maturity Model (2002)	Simple information dissemination	Two-way communication	Service and financial transactions	**Horizontal and vertical integration**	Political participation
Windley Maturity Model(2002)	Simple website	Online government	**Integrated government**	Transformed government	
Chandler & Emmanuel (2002)	Information	Interaction	Transaction	**Integration**	
Lam (2005)	Informational E-Government	Transactional E-Government	**Process Integrated E-Government**	**Service Integrated E-Government**	
Shahkooh Maturity Model (2008)	Online presence	Interaction	Transaction	**Fully integrated and transformed e-government**	Digital democracy
Kim and Grant Maturity Model (2010)	Web presence	Transaction	**Integration**	Continuous improvement	
Chen Maturity Model (2011)	Catalogue	Transaction	**Vertical integration**		
Alhomod Maturity Model (2012)	Presence on the Web	Interaction between the citizen and government	Complete transaction over the web	**Integration of services**	

This summary shows that integration is a key part of e-government maturity, but that it tends to be achieved in the later stages of maturity.

2.5.3 Critique of e-government maturity models

E-government maturity models such as the Layne and Lee model are not without their weaknesses. The Layne and Lee model has been criticised for overemphasising the importance of technology in e-government development (Andersen & Henriksen, 2006). Ignoring the influence of organisational and societal institutions is one of the significant examples of "e-government failing to live up to its expectations" (Andersen & Henriksen, 2006). The use of e-

government maturity models has thus sparked controversy. According to Coursey and Norris (2008), e-government maturity models assume the following:

- That the development or evolution of e-government follows a linear pattern from a basic online presence to full integration, seamlessness, and transformation. "In practice, however, the individual phases occur simultaneously and are part of different elements of e-government" (Andersen & Henriksen, 2006:239).
- They suggest that the development of e-government is progressive with assumptions that each successive stage of e-government is better than the previous one.
- They also assume that progression is stepwise (governments have to proceed through each step in a series).
- Moreover, the view of an "e-government maturity model" no longer holds as "e-government goal are constantly evolving to meet emerging challenges and increase public value" (United Nations, 2014:14).

The weaknesses of e-government maturity models as evidenced by their criticism from the literature is undeniable. However, these e-government frameworks and models do have value. Although it is beyond the scope of this study, these maturity models can certainly be used as a guide for understanding the complexity of e-government evolution, rather than as a prescription for how e-government should evolve.

2.6 E-government interoperation and interoperability

Interoperation in e-government occurs "whenever independent or heterogeneous information systems or their components, controlled by different jurisdictions/administrations or by external partners, smoothly and effectively work together in a predefined and agreed upon fashion" (Scholl & Klischewski, 2007:900). E-government interoperation is defined as "the technical capability for e-government interoperation" (Scholl & Klischewski, 2007:900). Dos

Santos and Reinhard (2012:72) define interoperability as "the ability of a system or process to use information and/or functionality of another system or process through the adherence to common standards". Pardo, Nam and Burke (2012:7) on the other hand are of the view that interoperability "represents a set of multidimensional, complementary, and dynamic capabilities needed among these networks of organizations in order to achieve successful information sharing", they argue that interoperability must include social and other dimensions as it goes beyond technology.

The above definitions show that there is no standard definition for interoperability. Dos Santos and Reinhard (2012) for example define interoperability from a more technical perspective while Pardo, Nam and Burke (2012) are of the view that it is much broader than technical and should incorporate socio-political and other issues. Part of this inconsistency perhaps stems from the origin of the term interoperability which has its roots in computer science which is a hard science. In computer science, the term is used in "the context of middleware that provides the capability for data to be exchanged between two software components" (Scholl & Klischewski, 2007:901). After a synthesis of the common definitions emerging from the literature, the following definition is proposed and will be used in this study. Interoperability is "the ability of independent systems and processes (technical and non-technical) to exchange data and information and communicate using common standards to enhance efficiency and service delivery" (adapted from Dos Satos & Reinhard, 2012:72).

2.6.1 Interoperability perspective

Interoperability can be viewed from many perspectives as proposed by Elmir & Bounabat (2012). The following perspectives are proposed:

- Levels of interoperability concern (data, service, process and business level).
- Approaches to implementation (unified, federated or integrated approach).

- Barriers to interoperability (technical, organisational and conceptual).
- The scope of application (external across independent entities or internally within the same organisation).
- Transactional aspects of cooperation (asynchronous or synchronous collaboration).
- Measurement (performance efficiency, compatibility and potentiality)

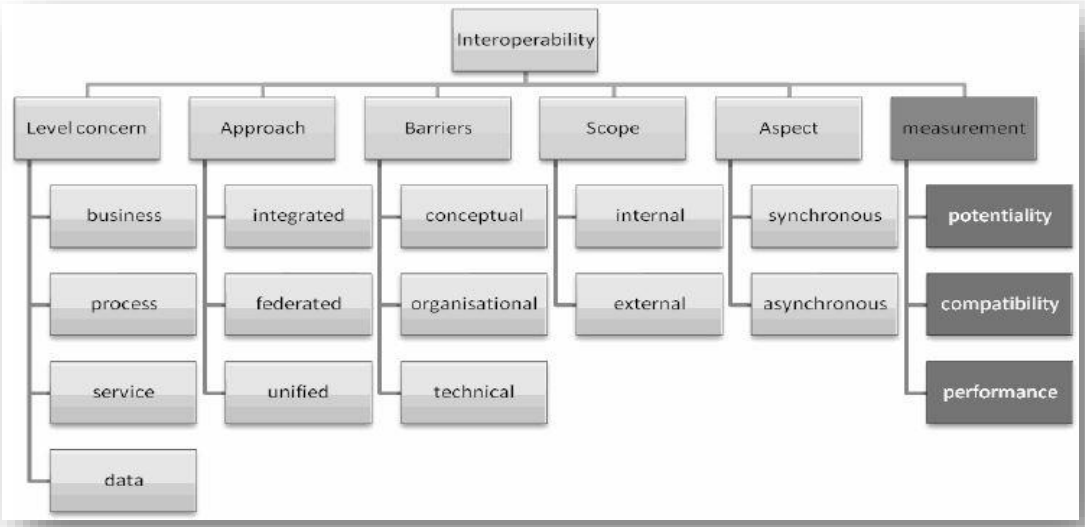

Figure 3: E-government interoperability framework (Elmir & Bounabat, 2012)

The following perspectives of interoperability are relevant to this study:

- Level of interoperability (data, process and business level)
- Barriers (institutional barriers compromising interoperability)
- The scope of application (interoperability across government departments)
- Approaches to implementing interoperability (specifically the integrated approach)

These perspectives are in line with the goal of this study whose aim is understanding integration, interoperability and information sharing barriers at government department level which is key in achieving integrated government through process, service and data integration. The measurement perspective was not relevant as it wasn't the intention of this study to

measure performance, compatibility and potentiality. Despite the fact that collaboration was identified as one of the key themes in this study, investigating transactional aspects of cooperation (asynchronous or synchronous collaboration) was not core in this study.

2.6.2 Layers of interoperability

There are several layers of e-government interoperability identified in the literature. These are summarised and defined in Table 3.

Table 3: Layers of interoperability

Layers	Definition
Judicial/ policy interoperability	The focus is on compatibility between regulations and policies in promoting interoperability (Goldkuhl, 2008; Charalabidis et al., 2010).
Organisational interoperability	Focuses "on collaboration and alignment of processes in organisations to achieve shared goals" (Gottschalk& Solli-Sæther, 2009:312). Organisational interoperability is achieved through the integration of business processes and the sharing of information. (Goldkuhl, 2008; Charalabidis et al., 2010; Gascó, 2012). It is thus "the extent to which organisations using different work practices are able to communicate" (Gottschalk & Solli-Sæther, 2009:312)
Semantic interoperability	Focuses "on the application, meaning and interpretation of data and information being exchanged between systems" (Gottschalk& Solli-Sæther, 2009:312). Metadata, classifications systems and thesauruses are significant examples of tools for enhancing semantic interoperability (Charalabidis et al., 2010; Gascó, 2012). It is the extent to which information systems using different terminology are able to communicate (Gottschalk & Solli-Sæther, 2009).
Technical interoperability	These are technical issues that enable technical components in the information systems to cooperate and work together. It addresses issues of data integration, security, middleware, and data exchange (Goldkuhl, 2008; Charalabidis et al., 2010; Gascó, 2012)

The main focus of this study is on interoperability barriers, across multiple organisations (externally), across different levels in an integrated approach. The primary focus is policy and organisational interoperability as the focus of this study is to understand institutional (policy and organisational) issues impacting interoperability. Organisational interoperability focuses on aligning processes and promoting collaboration to promote a shared vision. To promote

interoperability, policy interoperability places emphasis on promoting compatibility and aligning regulations, policies, rules and laws. Although technical issues are discussed in this study, technical interoperability which focuses on technical issues of interoperability will not be the primary focus. Semantic interoperability is also not the main focus.

2.6.3 Stages of e-government interoperability: a stage model for e-government interoperability

Progressing to higher levels of e-government interoperability enhances operational effectiveness for the provision of better quality services to citizens (Lam 2005, Lisboa & Soares, 2014). The stage model for e-government interoperability by Gottschalk and Solli-Saether (2009) proposes four stages of e-government interoperability. The four stages are:

Stage 1. This stage involves aligning work processes of interoperating organisations so as to increase e-government interoperability. At this stage, "integration and efficiency in work processes from interoperability is important" (Gottschalk & Solli-Sæther, 2009:313).

Stage 2. In this stage, the focus is on collecting and storing knowledge in interoperating organisations. This stage is driven by employees (knowledge workers in collaborating organisations). At this stage, "effectiveness and learning in inter-organisational relationships from interoperability is important" (Gottschalk & Solli-Sæther, 2009:313).

Stage 3. This stage involves collaboration between interoperating organisations to create new value. This stage involves activities such as problem identification, creating solutions, decision making, implementation and evaluation. At this stage "interoperability is concerned with interactions between primary activities in different value configurations present in electronic government" (Gottschalk & Solli-Sæther, 2009:313).

Stage 4 focuses on "strategic alignment where interoperating organisations apply two-way linked planning with reciprocal integration in strategy work. The purpose of integration is to support and influence organisational strategy" (Gottschalk & Solli-Sæther, 2009:313). Information technology at this stage is recognised as a key enabler of the organisational strategy. Strengthening synergies among organisations is critical at this stage.

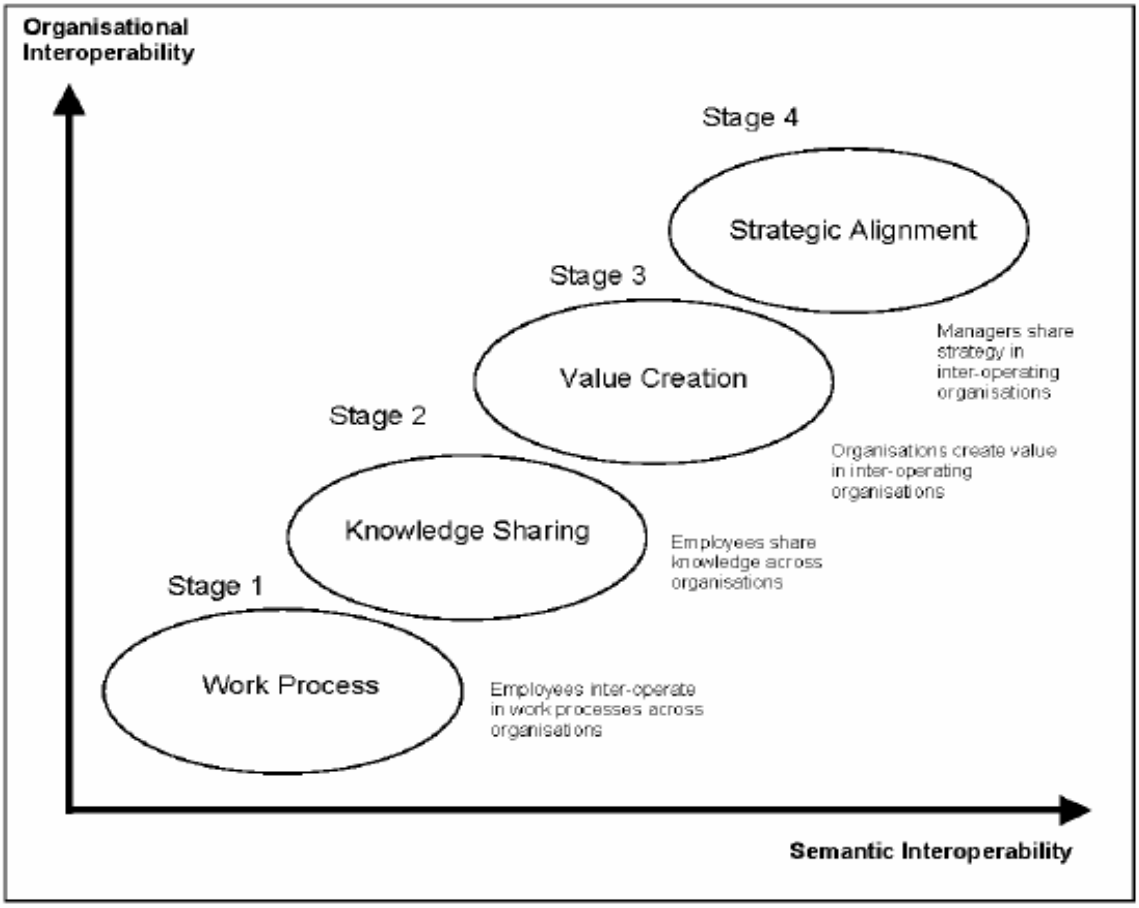

Figure 4: Interoperability stage model (Gottschalk & Solli-Saether, 2009)

The interoperability stage model focuses on organisational and semantic interoperability but ignores technical and policy interoperability which are also critical in e-government interoperability. The interoperability variables, layers and stages identified in these models are however useful analytic tools for understanding aspects of organisational interoperability such as culture, behaviour and knowledge sharing.

2.7 Inter-organisational information sharing / Cross-boundary information sharing

There is no consistent definition of cross-boundary information sharing in the literature reviewed. Some studies emphasise technical elements while some emphasise the softer issues such as social and organisational aspects in defining cross-boundary information sharing (Gil-Garcia, Schneider, Pardo & Cresswell, 2005). Barki and Pinsonneault (2005:651), for example, reflect a technical bias defining cross-boundary information sharing as the "collaboration or interconnection of different information systems or telecommunication technologies to share data with a common conceptual schema between entities such as groups, departments and organizations". Other definitions emphasise the use of technology as a tool for information sharing. Fan, Zhang and Yen (2014) define cross-boundary information sharing as the collaboration of one or more governments or government agencies for information sharing purposes using information and communication technology tools. Technology neutral definitions define information sharing less in terms of technology with an emphasis on organisational aspects and outcomes. Dawes (1996) for example defines information sharing as the exchange of information between entities or granting entities in the same network access to information.

Gil-Garcia, Schneider, Pardo & Cresswell (2005) and Pardo, Nam and Burke (2012) advocate for the adoption of the socio-technical view. Cross-boundary information sharing is understood as a socio-technical phenomenon that is influenced by a complexity of social, technical, organisational, political and policy issues. This emphasises the importance of multidisciplinary studies which integrate various disciplinary perspectives in trying to understand complex issues in integration, interoperability and information sharing. This view is reiterated by Simon, Janneck and Gumm (2006:470) who argue that "the widespread use of IT is a complex

phenomenon, promoting economic, political, social, and behavioural change at all levels of human action". It is a phenomenon that can be understood better from a multidisciplinary point of view.

2.7.1 The Enhanced Framework to Explore the Effectiveness of Cross-Boundary Information Sharing

Cross-boundary information sharing is affected by a myriad of factors which are explored in the "Enhanced Framework to Explore the Effectiveness of Cross-boundary Information Sharing" proposed by Yang and Wu (2015:11). The framework is described in Figure 5.

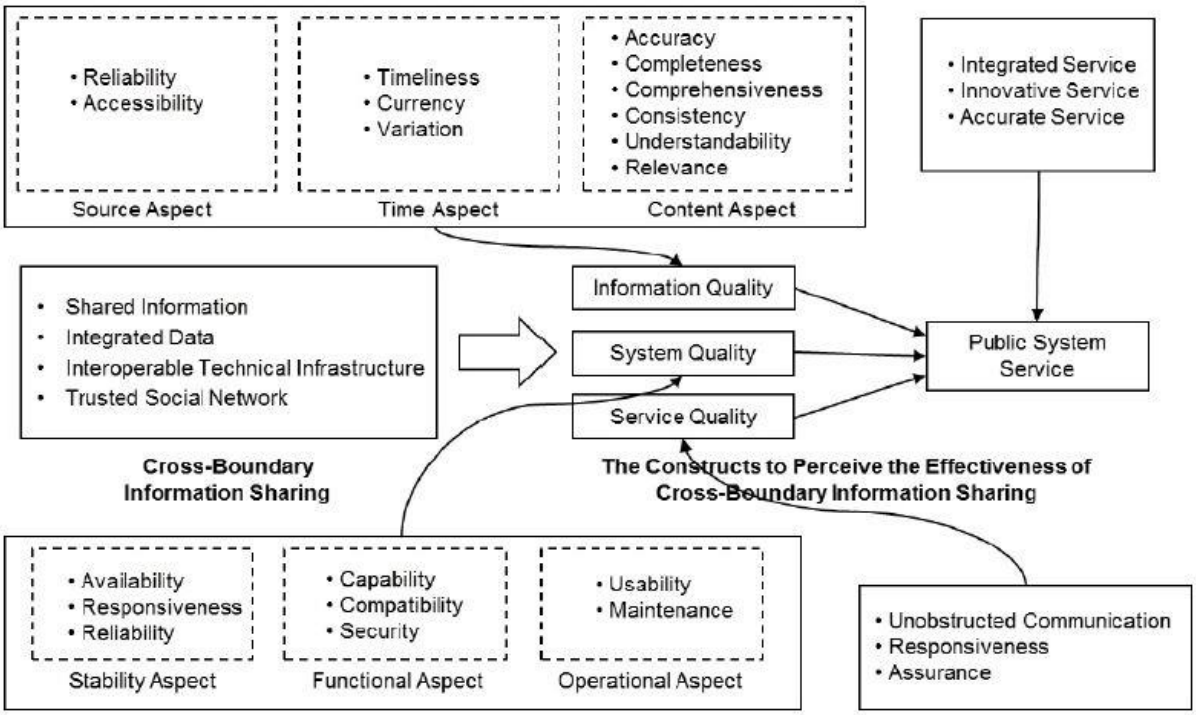

Figure 5: The Enhanced Framework to Explore the Effectiveness of Cross-boundary Information sharing (Yang & Wu, 2015:11)

According to Yang and Wu (2015:11), "cross-boundary information sharing is a complex phenomenon" that involves sharing information, integration of data, and interoperation of systems in a trusted social network of organisations.

The framework also proposes information quality, systems quality and service quality as the three constructs that contribute to public system service. Moreover, information quality, systems quality and service quality act as fundamental prerequisites in sustaining a public service system. Integration of services, innovation and accurate services are also identified as key contributors to an efficient public system service.

2.8 E-government integration, interoperability and information sharing: towards a common understanding

Information sharing, interoperability and integration are closely related terms which are often confused by scholars (Scholl, Kubicek, Cimander & Klischewski, 2012). The discussions in earlier sections highlight the extent of inconsistencies in the definitions. This study attempts to assess the nature of relationships and differences between integration, interoperability and information sharing.

2.8.1 Interoperability as an enabler of cross-boundary information sharing

Fan, Zhang and Yen (2014) argue that information sharing requires interoperability among participating government agencies. Scholl and Klischewski (2007) and Scholl, Kubicek, Cimander and Klischewski (2012) also echo the same sentiment arguing that interoperation of systems is a prerequisite for information sharing among government agencies. Information sharing initiatives in government involve building systems that are interoperable, putting in place formal standards and business processes to allow inter-organisational data and information sharing (Gil-Garcia, Schneider, Pardo & Cresswell, 2005; Gil-Garcia, Chun & Janssen, 2009). Information sharing, therefore, focuses on the exchange of information, experience, innovation etc. among government agencies so as to enhance efficiency and service delivery for the benefit of government stakeholders.

2.8.2 Interoperability as an enabler of integration

Chen, Doumeingts and Vernadat (2008:648) distinguish integration and interoperability arguing that "interoperability has meaning of coexistence, autonomy and federated environment, whereas integration refers more to the concepts of coordination, coherence and uniformization". They further argue that "two integrated systems are inevitably interoperable, but two interoperable systems are not necessarily integrated" (Chen, Doumeingts &Vernadat, 2008:648). Al-Nasrawi & Ibrahim (2013) on the other hand argue that interoperability between government agencies is a prerequisite for achieving seamless e-government integration. Moreover, the ability to "interoperate is key to reducing ICT integration costs and inefficiencies, increasing business agility, and enabling the adoption of new and emerging technologies" (Lueders, 2005:1).

It is evident that there seems to be no common understanding of integration, interoperability and information sharing among e-government scholars. This is largely due to the fact that e-government research has attracted a multidisciplinary community of scholars from disciplines such as computer science, information science, information systems, political science and public administration with diverse philosophical paradigms and theoretical assumptions. It is against this background that Scholl, Kubicek, Cimander and Klischewski (2012:313) concluded that these terms are "intertwined and inextricably interrelated". They further propose the use of the "compound acronym of INT-IS-IOP as a term for integration (INT), information sharing (IS), and interoperation/interoperability (IOP)" (Scholl, Kubicek, Cimander & Klischewski, 2012:313).

The confusion around the understanding and definition of information sharing, interoperability and integration, has led to the terms being used interchangeably. The boundaries between these

interrelated terms have not been clearly defined in the literature. This study follows the approach recommended by Scholl, Kubicek, Cimander and Klischewski (2012) and examines the compound construct.

2.9 Institutional barriers to e-government integration and interoperability

Governments worldwide are transforming to "smart governments" as a way of responding to increasingly connected and smart societies that demand efficient service delivery. The integration and interoperability of e-government systems and information sharing emerged as one of the key enablers of transforming governments into smart governments (Du & Qin, 2014; Gil-Garcia, Zhang & Puron-Cid, 2016). In smart government, public organisations need to adapt and collaborate with each other to fully leverage the advantages of new technologies. Interoperability and integration are thus important in fostering collaboration between organisations (Maheshwari & Janssen, 2014).

According to Jiménez, Solanas and Falcone (2014:22), "as technological advances in data gathering, processing, and management continue, our ability to move from an information society to a smart society will increasingly rely on improvements and expansion in technical, organizational, and other aspects of e-government interoperability". Governments are however facing challenges in progressing due to poor integration and interoperability (Lam, 2005; Pardo, Nam & Burke, 2012). Achieving high levels of interoperability remains one of the most significant constraints confronting e-government practitioners and managers (Lisboa & Soares, 2014).

There are a myriad of barriers to integration and interoperability that are still puzzling academic researchers and e-government practitioners. This notion is substantiated by Scholl and Klischewski (2007:890) who argue that "the complex nature or the exact extent of these

challenges and constraints regarding integration and interoperability are not well understood, neither in practice nor in theory". Several e-government researchers acknowledge the gap that exists in the literature but few have approached interoperability and integration using a multidisciplinary approach as advocated by Scholl (2008).

Research on e-government interoperability and integration has identified a complexity of constraints such as technological, social, political, legal and organisational barriers to achieving integration and interoperability but few have systematically analysed and tackled these challenges using a multidisciplinary approach underpinned by theory (Scholl & Klischewski, 2007). This is especially true in developing countries where few such studies exist. This is one gap this study is hoping to address by making use of Institutional Theory and the Circuits of Power Framework to understand barriers to e-government integration, interoperability and information sharing which are preventing the progression of governments to smart governments. The two theories are discussed in detail in the next chapter (Chapter 3)

Scholl and Klischewski (2007) also called for the need to synthesise the fragmented literature. This is largely due to the fact that the literature is scattered across disciplines such as public administration, information science, computer science and information systems, with studies exhibiting disciplinary bias (Scholl, Fidel & Mai, 2006; Scholl & Klischewski, 2007; Scholl, Kubicek, Cimander and Klischewski, 2012). The fragmented literature from across disciplines is synthesised in this study. Synthesising the literature is critical in producing new knowledge previously missed in existing studies (Crossan & Apaydin, 2010). The barriers to integration are discussed in the following sub-sections.

2.9.1 Technology barriers

Information technology (IT) forms the basis of inter-organisational interoperability within the "organizational, sociological, ideological and political contexts" (Yang & Wu, 2014:652). Technological or technical barriers are amongst the most common barriers preventing governments from achieving interoperability and integration. Integration and interoperability studies in Singapore and the United Kingdom by Lam (2005) and in Taiwan by Yang and Wu (2014) revealed that technological factors such as incompatible technical and data standards, changing technology, lack of flexibility in legacy systems and different security models are identified as the major threats to achieving integration. Similarly, studies in Sub-Saharan Africa concluded that there is a lack of standards for promoting the interoperability of government systems (Ngulube, 2007).

In Taiwan, Yang (2012) found that technological capability among the participating organisations was critical in promoting the success of integration and information sharing initiatives. In New Zealand, Lips, O'Neill and Eppel (2011:257) identified incompatibility of hardware or software, mismatched data structures, incompatible database designs, incongruous data and information distribution channels, and conflicting data definitions and different terminology. Inconsistencies in technology capability are a barrier to successful integration, interoperability and information sharing.

Integration and interoperability bring with them security concerns in systems and data that government agencies share (Yang & Maxwell, 2011; Dos Santos & Reinhard, 2012). Technology barriers cannot be viewed in isolation from the social dimensions of interoperability (Pardon, Nam & Burke, 2012). Technology constraints are also influenced by other factors such as skills, social, political and resource constraints (discussed below).

2.9.2 Skills barriers

Fan, Zhang and Yen (2014) argue that ICT skills and expertise play a critical role in ensuring the success of e-government integration and interoperability. An earlier study by Heeks (2002) concluded that the lack of ICT and management skills in the majority of African countries were to blame for slow progress in e-government. Developing countries in Asia and the Middle East, for example, Bangladesh have also reported inadequate ICT skills as a constraint in ICT and e-government development (Imran & Gregor, 2010). In Sub-Saharan Africa, human resources are scarce due to the brain drain and lack of capacity building programmes (Ifinedo, 2006; Ngulube, 2007; Mutula & Mostert, 2010). Studies in Botswana also cited low ICT skills levels among government officials tasked with the implementation of e-government initiatives as a serious concern (Nkwe, 2012). This has hindered smart governance through interoperability and integration. The lack of financial resources contributes significantly to this constraint by preventing governments from training and retaining skilled human resources to drive the digital transformation agenda.

2.9.3 Socio- technical / socio-cultural barriers

The role of culture and other social aspects in the successful implementation and adoption of e-government is well documented. Karlsson et al. (2017) argue that social barriers to integration, interoperability and information sharing in organisations are as just as complex as technological barriers. According to Ifinedo (2006), cultural norms and patterns of social behaviour have an impact on the development of e-government. Cross-boundary information sharing in the public sector is thus "a complex task and usually happens in a diversified environment with participants having different values, goals, and cultures" (Yang, 2012:143). Cordella and Lannacci (2010) warn against viewing information and communication technology (ICT) in isolation and propose the socio-technical perspective where social aspects such as culture are embedded in technology.

Fountain's (2004) Technology Enactment Framework also places emphasis on the sociotechnical perspective. The framework draws from social disciplines and theories such as governance, organisational architecture and Institutional Theory in a bid to study how organisations enact ICT according to their social and organisational features. A study on the implementation of ICT projects in Nigeria concluded that "technology affects work practices, which in turn affect the implementation, use and non-use of the technology. When work practices change, they impact organisational culture and, in turn, the change in culture affects work practices" (Zamani, Choudrie, Umeoji & Adebola, 2017:657).

In Africa, the challenge is the multi-cultural nature and language diversity in the majority of countries (Schuppan, 2008). In South Africa for example, which has eleven official languages, implementing e-government equitably requires a multi-lingual and multi-cultural approach which is challenging in e-government as the process has to overcome cultural differences and long-standing hostilities (Maumbe, Owei & Alexander, 2008). Zamani, Choudrie, Umeoji & Adebola (2017) also reiterated that Nigeria, like many African countries, was a multicultural society and managing diversity was one of the challenges in the implementation of ICT projects in the public sector.

Governments often find themselves in the middle of competing concerns of various stakeholder groups when it comes to interoperability and information sharing initiatives (Fedorowicz, Gogan & Culnan, 2010). In most African countries, the socio-historic and socio-cultural context plays a major role in influencing policy decisions including e-government. This arguably makes socio-cultural and socio-technical constraints common. Such constraints can be challenging to address due to their complexity. One can also argue that the multi-cultural

nature of the majority of African countries, makes information sharing more complex and resource intensive due to the need to promote inclusiveness.

2.9.4 Organisational barriers

The role of internal organisational factors in the success of e-government integration, interoperability and information initiatives also deserves closer attention. In China, studies of information sharing by Yang and Maxwell (2011) found that complexity in information sharing is exacerbated by the different organisational cultures, values and trust issues among participating government agencies. In Mexico, studies by Luna-Reyes, Gil-Garcia and Cruz (2007) concluded that inter-organisational collaboration, a cornerstone for e-government integration and interoperability is often compromised by weak institutional frameworks, unsupportive organisational structures and managerial constraints.

Organisational processes may differ between organisations to such an extent that integration and interoperation might prove exceedingly difficult to achieve without standardising on processes, systems, and policies. In cases where there is alignment within government agencies, this brings the advantage of achieving a higher degree of integration and interoperation (Scholl & Klischewski, 2007).

External organisational factors that might hinder integration and interoperability include ill-preparedness by participating government agencies and a slow pace of government reform and outdated legacy systems and government processes (Lam, 2005; Fan, Zhang & Yen, 2014). Under-preparedness is often due to the fact that the e-government agendas in both developed and developing countries are often directed by external and influential bodies such as the United Nations and similar international bodies. According to Lisboa and Soares (2014:639), “many countries are moving towards implementing interoperability frameworks, not only

because they perceive them as an important instrument to foster and facilitate interoperability of public systems but also due to financial and political pressures set by prominent and powerful organisations and institutions such as the European Commission, United Nations, and the World Bank". Here we observe the role of coercive isomorphic pressure in influencing government policy decisions to adopt integration, interoperability and information sharing initiatives.

Earlier studies in e-government integration studies in developed countries such as Denmark, Netherlands and UK by Weerakkody, Janssen & Hjort-Madsen (2008) concluded that the traditional organisation of government agencies vertically around functional structures with no standardised processes has resulted in poor coordination of processes and integration of underlying e-government systems and presents a significant challenge. Studies in Nigeria also identified rigid structures and bureaucratic systems as a stumbling block in e-government progression as these delay progress in the implementation of e-government institutional mechanisms (Ifinedo, 2006). These issues may be a contributing factor to resistance to change, another barrier to digital transformation (Ndou, 2004; Lips, O'Neill & Appel, 2011; Nkwe, 2012).

2.9.5 Resource barriers

Costs and lack of resources hamper the integration and interoperability of information systems. The cost of e-government integration projects can easily spiral out of control due to the complexity of e-government integration projects (Scholl & Klischewski, 2007; Yang & Maxwell, 2011). Fan, Zhang and Yen (2014) argue that costs in development, implementation, maintenance and training associated with e-government integration projects are a barrier to the integration of e-government systems especially in cases where benefits are not clearly defined and costs are not predictable.

Dawes, Cresswell and Pardo (2009) are of the view that unavailability of funding is often perceived as one of the most severe challenges in cross-boundary information sharing initiatives. In interoperability initiatives, "perceptions about resource dependence and equality or inequality have strategic implications for the participating organizations including strategies for dealing with interdependence and uncertainty" (Dawes, Gharawi & Burke, 2012:117). In developing countries, resource constraints are a serious issue as the majority of countries are prioritising the alleviation poverty hence e-government is not an immediate priority (Ifinedo, 2006; Ngulube, 2007; Maumbe, Owei & Alexander, 2008). Resourcing in institutions is thus critical for the success of e-government initiatives, without which the coordination and support of institutional activities are compromised.

2.9.6 Stakeholder barriers

According to Letaifa (2015), the inclusion and participation of stakeholders in transparent decision-making processes lead to smart governance. This view is reinforced by Scholl and Scholl (2014) who reiterate that smart governance facilitates interactions between government, citizens and business to improve stakeholder engagement and participation in policy-making and governance. This promotes accountability and transparency in policy and decision-making. Governments often find themselves in the middle of competing concerns of various stakeholder groups when it comes to interoperability and information sharing initiatives (Fedorowicz, Gogan & Culnan, 2010). Mitchell, Agle and Wood (1997) proposed a theory of stakeholder identification which identifies attributes such as power, legitimacy and urgency as key in understanding stakeholders. Identification of key stakeholders and their concerns, as well as strategies to address their concerns, is therefore important in enhancing governance in the smart environment (Fedorowicz, Gogan & Culnan, 2010).

Citizen engagement and participation in e-government activities is one of the key features of smart societies and therefore an important feature of smart governance. Electronic participation (e-participation) is defined as the use of Information and Communication Technologies (ICTs) to enhance citizen engagement and political participation (Fedotova, Teixeira, & Alvelos, 2012; Panopoulou, Tambouris & Tarabanis, 2014). The use of sophisticated ICTs in government has "little social value if citizens are not able to use services or interact in political processes in meaningful ways" (Helbig, Gil-Garcia & Ferro, 2009:89).

2.9.7 Strategy barriers

A lack of shared e-government goals and objectives, over-ambitious e-government milestones and lack of ownership, poor governance and absence of implementation guidance compromises integration, interoperability and information sharing initiatives (Lam, 2005). The successful implementation of any e-government initiative requires planning and a strategy to guide the process (Shahkooh, Abdollahi, Fasanghari & Azadania, 2009). Integration and information sharing was also found to be unlikely in organisations that do not share similar goals or follow the same business processes (Yang, Zheng & Pardo, 2012). Pardo, Nam and Burke (2012) advocate for the need to create clear strategic plans that address the vision for achieving integration of e-government as well as assessing efficiency and effectiveness of e-government initiatives and to control costs. A strategy is important in aligning the development of information systems with the overall e-government strategy and other national strategies.

In developing countries, evidence suggests that the significant challenge seems not to be the absence of strategy but the absence of appropriate and context-specific strategies (Ndou, 2004). Poor e-government strategies or their absence has thus hindered the majority of the countries in Africa and other developing countries in moving to higher levels of e-government (Ngulube, 2007; Schuppan, 2008). One can argue that strategy execution more than strategy absence

seems to be a serious constraint preventing progress in e-government integration, interoperability and information sharing. Resourcing and activities associated with strategy implementation thus continue to be serious barriers in effective implementation.

2.9.8 Policy and legal barriers

Public institutions are highly regulated compared to other institutions (Scott, 2014). Over-regulation in public institutions has the potential to slow down innovation within public institutions. The need to operate within the regulatory framework makes it difficult to deal with some of the interoperability and integration challenges. The regulatory environment thus influences institutions in conforming to the desired behaviour. Dawes, Cresswell and Pardo (2009) identify policy as one of the biggest obstacles that prevent inter-agency information sharing.

According to Lofgren (2007:336), "mainstream e-government literature rarely goes beyond basic descriptions of the policy ideas and the actors behind them. The bargaining and negotiations between policy actors (both inside and outside the government), which initiate the policy, set the agenda, as well as actually implement the policy, has been notably overlooked in the literature of e-government." This is one of the gaps which this study is hoping to address.

The lack of supportive legal and policy reforms is one of the barriers that has compromised the digital transformation of governments (United Nations, 2014). In New Zealand, Lips, O'Neill and Eppel (2011) identified restrictive laws and regulations and concerns over issues of citizen's privacy and confidentiality as major barriers. Earlier studies conducted in New Zealand, Hong Kong and Singapore concluded that legal issues concerning data ownership and citizen privacy, and lack of policy that addressed e-government integration and interoperability was a major barrier (Lam, 2005). Concern over policy adequacy in addressing issues of

personal information privacy was also highlighted in some studies in the United States of America and European countries (Otjacques, Hitzelberger & Feltz, 2007; Guijarro, 2007).

Fan, Zhang and Yen (2014) in their studies in China concluded that the lack of policy compatibility and enforcement has promoted the poor implementation of e-government, including integration, interoperability and information sharing initiatives. Policy and legislation as a regulative mechanism thus play a significant role in influencing the desired behaviour through legal sanctioning during the implementation of reforms. Regulative mechanisms are thus critical in managing risks associated with digital transformation as they provide a regulative framework for allocating resources to institutions, fostering trust and promoting collaboration during the institutionalisation of reforms that promote integration, interoperability and information sharing.

Jurisdictional and policy constraints in the USA were identified as major constraints restricting federal, state and local governments from achieving integration and interoperability as there were no legal requirements for interoperability (Scholl & Klischewski, 2007). The structuring of government e.g. federal versus unified or integrated government thus plays a critical role in the ease of integration or interoperability. The legal and policy framework is critical in managing risks, encouraging inter-agency integration, collaboration and builds trust. Policy compatibility is also critical. Studies by Fan, Zhang and Yen (2014) found that lack of policy compatibility and enforcement has resulted in e-government incompatibility which has compromised integration, interoperability and information sharing. Policy and legislation are thus critical institutional coercive mechanisms for shaping the desired behaviour through legal sanctioning.

2.9.9 Political barriers

The majority of governments in developing countries are still undergoing political transformation. Slow transformation to democracy in many developing countries in Africa has been cited as a constraint to e-government development (Maumbe, Owei & Alexander, 2008; Schuppan, 2008). Rigid political structures, inefficiency in governance and corruption have been cited as some of the significant barriers preventing e-government development (Ifinedo, 2006; Schuppan, 2008). Political instability and bad governance in some developing countries have slowed e-government progression (Ndou, 2004). One may argue that rigid structures, lack of political transformation and poor governance suggests a lack of political will and may perpetuate a culture of secrecy in government. This is not conducive to information sharing as governments might fear that transparency might subject them to public scrutiny and the need to account for their decisions thereby threatening their legitimacy (Yang & Maxwell 2011).

Moreover, political pressure for governments to improve their e-government services has often resulted in governments being coerced into implementing e-government initiatives they are not ready to implement (Lisboa & Soares, 2014). This often compromises the effectiveness of such initiatives as these often require significant resourcing, policy changes and institutional reforms which governments might have underestimated. Developing countries are more likely to be affected by this barrier as the majority are still undergoing major political reforms aimed at strengthening good governance, democracy and other institutional reforms. Governments are often under pressure to achieve international legitimacy by adopting resolutions from international development organisations such as the International Telecommunications Union and the United Nations. According to Scott (2014:159), “to be effective, the use of coercion requires relatively clear demands, effective surveillance, and significant sanctions”. One can

argue that in reality it goes beyond clear demands, surveillance and sanctioning as the institution's capability and state of "readiness" is also an important determining factor.

2.9.10 Leadership barriers

Top leadership at national government department level plays a significant role in e-government integration initiatives by managing change, securing resources and minimising resistance to change (Ndou, 2004; Fan, Zhang & Yen, 2014; Chen, Chen, Huang & Ching, 2006). Lam (2005) echoes the same sentiments stipulating that the lack of in-house management, integration project champions and technical expertise are a major blow in integration initiatives.

The lack of political will is arguably one of the significant leadership challenges in e-government development as political leaders are ultimately responsible for promulgating policy and legislation that supports such development (Schuppan, 2008). The importance of political leadership is reinforced by Dawes, Cresswell and Pardo (2009:398) who note that political leadership command power and authority that is critical for "negotiating powerful bureaucratic processes such as budgeting, clarifying leadership responsibilities and ensuring the participation of all key people". Lips, O'Neill and Eppel (2011) identify the lack of executive leadership at a political and legislative level as a significant barrier in e-government integration and interoperability initiatives. The emphasis is on top leadership in government taking a leading role in providing guidance and support in e-government integration and interoperability initiatives.

Dawes, Cresswell and Pardo (2009) identify an important dimension of the leadership challenge highlighting that personal qualities of leaders play a more critical role in inter-government information sharing initiatives than their expertise. They point out attributes such

as willingness to experiment, trust, commitment, mission focus, people skills and communication, nurturing a participative culture and nurturing a culture of joint responsibility.

Scholl and Klischewski (2007) also identify management constraints as a barrier to e-government interoperability. They argue that complexity arises when government agencies involved in the interoperability initiatives have different interests and needs. Ndou (2004) highlights the importance of institutional leadership, where a leading institution in government takes charge of coordination, resourcing, influencing and motivating other players in government initiatives. In this instance leadership uses normative mechanisms such as standards, procedures and rules to influence desired social behaviour. These institutions can influence the desired behaviour by providing visionary and exemplary leadership in e-government that other participating government institutions might want to mimic.

2.9.11 Information sharing barriers

Several factors have hindered the ability of governments to share information for effective service delivery. Issues of information quality have an impact on the willingness of government agencies to participate in cross-boundary information sharing (Yang & Maxwell, 2006; Klischewski & Scholl, 2008). There is fear that poor quality information will expose government agencies to reputational risk (Yang & Maxwell, 2006; Fan, Zhang & Yen, 2014). Other information constraints include perceived political risks, loss of power and competitive advantage associated with sharing certain information (Zhang & Dawes, 2006; Fan, Zhang & Yen, 2014).

In China, Fan, Zhang and Yen (2014:122) identified trust as one of the key constraints in information sharing. They argue that participating government agencies may also fear that integration may result in misinterpretation or misuse of the information or exposure of sensitive

information or losing competitive advantage or political risks such as losing authority. The fear of information misuse or misinterpretation of shared information also emerged strongly as a constraint in studies of cross-government agency collaboration in New Zealand (Lips, O'Neill & Appel, 2011). Trust as a barrier to integration, interoperability and information sharing is discussed in greater detail in the next subsection.

The use of information and communication technology (ICT) in interoperability and information sharing in government has given rise to ethical dilemmas related to the sharing and use of personal information (Fedorowicz, Gogan & Culnan, 2010). Government agencies may also fear that sharing information will result in loss of control once information is shared so as to avoid to public scrutiny (Pardo & Tayi, 2007; Yang & Maxwell, 2011). The desire for political leverage, power and influence in government is thus a barrier to information sharing.

Information privacy has also become a topical issue in e-government integration, interoperability and information sharing due to a growing need for both public and private institutions to protect the privacy and rights of citizens for legal, social, political and economic reasons (Otjacques , Hitzelberger & Feltz, 2007; Scholl & Klischewski, 2007; Fan, Zhang & Yen, 2014). Due to data privacy legislation in most countries, individuals are increasingly being given the power to control their personal information and privacy. This has the potential to compromise information sharing and interoperability as this has imposed restrictions on how citizens' information is shared. Privacy and trust in e-government integration, interoperability and information sharing is discussed next.

2.10 Trust, security and privacy barriers in e-government integration and interoperability

Citizens' trust of government, technology and e-government initiatives has a bearing on citizens' participation and adoption of e-government (Srivastava & Teo, 2009; Goldfinch, & Herbison, 2009). Before endorsing e-government initiatives, citizens must believe government agencies possess the capability for successfully implementing and securing these systems. An open and corruption-free interaction between citizens and e-government service providers will enhance citizen trust and acceptance of e-government services. On the contrary, unfulfilled promises, corruption and dishonesty from government officials and employees will decrease trust and increase opposition to these initiatives (Bélanger & Carter, 2008).

Distrust in government intentions often results in citizens withdrawing from voluntary compliance with governmental demands, regulations and resistance to government policy which prevents the government from performing effectively. Citizen participation in e-government initiatives was thus found to have a positive impact in building citizens trust in government (Kim & Lee, 2012). Gaining citizens' trust helps reduce complexities and helps gain efficiencies in public sector administration (Smith, 2010).

Trust among government agencies has been a serious constraint in the implementation of integration, interoperability and information sharing initiatives. Studies in China and New Zealand, for example, concluded that integration, interoperability and information sharing was constrained by low levels of trust among participating actors such as government agencies (Lips, O'Neill & Appel, 2011; Fan, Zhang & Yen, 2014).

The e-government trust model (Figure 6), proposed by Al-Omari and Al-Omari (2006) highlights five building blocks of trust in e-government. The building blocks are as follows:

1) Legislation and legal cover which provide a legal framework for the government and its stakeholders.
2) Policies and procedures that promote transparency and support the legal framework
3) Social and cultural practices based on previous experiences, fair and equal treatment of citizens and accountability.
4) Process automation that speeds up processes and delivery channels
5) Information technology security that foster trust in the digital environment

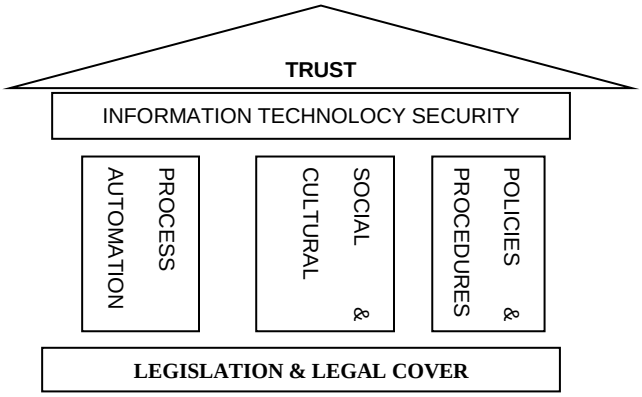

Figure 6: E-government trust model (Al-Omari & Al-Omari, 2006)

The e-government trust model covers essential building blocks of trust such as IT security, process automation, legislation, and legal cover, policy and procedures, and social and cultural practices. The model has however been criticised for its failure to incorporate other determinants of trust such as privacy controls, governance and citizen participation.

2.10.1 Inter-organisational trust

Trust between government departments promotes integration, interoperability and information sharing, an essential element in promoting digital transformation into a smart government. Factors contributing to mistrust between government agencies are summarised in Table 4.

Some of these factors reflect cultural-cognitive beliefs that are often difficult to deinstitutionalise such as the belief that "information is power", which may hinder integration, interoperability and information-sharing. Some can be categorised as regulative such as the fear for legal repercussions. Others may be categorised as normative such as quality concerns.

Table 4: Factors contributing to a lack of trust among government agencies

Factors	Reference
Reputation: Fear that integration, interoperability and information sharing may result in loss of reputation as a result of misrepresentation of the organisation's information.	Lips, O'Neill & Appel, 2011; Yang & Maxwell, 2011; Fan, Zhang & Yen, 2014;
Sabotage: Fear that the information may be used to sabotage the organisation.	Yang & Maxwell, 2011; Lips, O'Neill & Appel, 2011; Fan, Zhang & Yen, 2014
Legal: Fear of legal repercussions and liabilities as a result of the sharing of sensitive information.	Fan, Zhang & Yen, 2014
Power and politics: Risk of losing a source of power.	Yang & Maxwell, 2011; Fan, Zhang & Yen, 2014
Economics of information: Risk of losing the organisation's competitive advantage as information can be a source of economic power.	Zhang & Dawes, 2006; Fan, Zhang & Yen, 2014
Quality concerns: Mistrust of the quality of shared information.	Yang & Maxwell, 2011; Yang & Wu, 2014
Loss of autonomy: The agency sharing information may fear losing control once information is shared or when systems are integrated.	Yang & Maxwell, 2011
Public scrutiny: Fear that sharing information may expose agencies to public criticism and scrutiny.	Clarkson, Jacobsen, & Batcheller, 2007; Yang & Maxwell, 2011.
Protection of rights: The need to respect and protect the rights of all interested parties.	Fan, Zhang & Yen, 2014.

2.10.2 Trust as a multidisciplinary concept

Trust is often viewed as a complex and multidimensional phenomenon which has been studied from various disciplinary lenses (McLeod & Pippin, 2009). Research into trust according to Colesca (2009), has examined many dimensions that include managerial, economic, human-computer interaction, technology and the sociological approach. These various approaches provide useful lenses for understanding trust in e-government, a multidisciplinary field. Trust according to Tolbert and Mossberger (2006), is categorised into two types:

1) **Institution-based trust** in e-government is based on (a) transparency, (b) responsibility of government in handling citizens' personal information through implementing the relevant regulation, (c) increasing citizen participation and (d) improved efficiency and effectiveness of e-government services (Tolbert & Mossberger, 2006). It is thus based on how institutions are judged and expectations that an institution will do the right thing rather than interactions. (McKnight, Choudhury & Kacmar 2002).

2) **Process-based trust** in e-government is based on (a) responsiveness of government through communication with citizens, (b) increasing access to government services and information through online platforms, (c) increasing citizen participation and (d) improving efficiency and effectiveness of e-government services (Tolbert & Mossberger, 2006).

Regulative and other normative mechanisms, such as standards that promote digital transformation, play an important role in building institution-based trust. In the long term, they also contribute to promoting process-based trust through improved access, responsiveness and efficiency as citizens interact with government.

2.10.3 Determinants of trust in e-government

2.10.3.1 Privacy trust

Privacy trust is defined as "the belief that personal information entered into a system will remain private" (McLeod & Pippin, 2009:3). The increasing use of technology and the demand for integration and interoperability of services in government has given rise to ethical dilemmas related to the use and sharing of personal information. Advances in technology are making it challenging to control the privacy-intrusive use of technology (Aquilina, 2010). The protection of citizens' personal information and privacy is increasingly becoming a priority for governments in building citizen's trust in e-government initiatives (Alawneh, Al-Refai & Batiha, 2013). Concerns over citizens' privacy in the digital and connected environment is a major threat to the success of e-government initiatives due to increased scepticism and mistrust of e-government initiatives by citizens (Belanger & Hiller, 2006). There are several challenges that are confronting governments in enacting policies that address citizens' privacy concerns identified by Wright et al. (2009). These include:

- Societal challenges – Different interpretations of privacy by different stakeholders may be as a result of differences in social institutions behaviour and practices and behaviour.
- Technical challenges – The adoption of new and emerging technologies has transformed ways personal data is collected, shared and used.
- Economic challenges - Convincing other actors of the importance of personal privacy and investing in affordable mechanisms that promote privacy as well as addressing the economics of information.
- Political challenges – Achieving coherence through policy and legislation and the adequacy of such mechanisms in the consistent application of privacy regulation in both the public and private sectors.

2.10.3.2 Security trust

Security trust concerns have been worsened by an increase in online transactions between government and citizens, government and business, and among government agencies. Security trust is "the belief that the information system will be safe from hacking and the introduction of viruses or other malware" (McLeod & Pippin, 2009:3). The perceived security of the digital environment is, therefore, an important determinant of trust (Colesca, 2015). Without trust, e-government integration, interoperability and information sharing is compromised.

With increasing pressure from international organisations on governments to protect personal privacy and the increase in cyberterrorism, governments are at times finding themselves having to choose between the right to privacy and national security. The right of citizens not to have their privacy infringed, for example, is enshrined in the South African Constitution and the United Nations bill of human rights. For the sake of national security, governments may be forced to infringe on people's rights to privacy in an effort to gather personal data or intelligence on potential national security threats. Integration, interoperability and information sharing among government various agencies enable the timely sharing of intelligence, coordinating responses and monitoring.

2.10.4 Promoting security, privacy and trust through policy and legislation

Regulative mechanisms such as policy and legislation are important in addressing trust, privacy and security by providing procedures, guides and compliance programmes on privacy and security matters (Al-Omari & Al-Omari, 2006). On the other hand Wright et al. (2009) caution against the over-reliance on "broad-brush" policies which may not be relevant in addressing new challenges. They call for the development of ''micro-policies'' addressing specific issues on security and personal privacy.

Legislation is an important regulative institutional mechanism that is often viewed as the cornerstone for building security, privacy and trust (Al-Omari & Al-Omari, 2006). Legislative issues that need to be considered according to (Al-Omari & Al-Omari, 2006) include:

- Developing new acts to protect the confidentiality and privacy of users
- Developing regulations to solve global challenges in the development of the Internet as well as legislation to regulate the Internet
- Creating a national information and communication infrastructure
- Developing a legal framework for digital communication and transactions and online business.

2.11 Synthesis of e-government integration, interoperability and information sharing barriers

Several barriers to integration, interoperability and information sharing have been identified in the literature. In Table 5 the barriers are summarised for ease of reference.

Table 5: Barriers to integration, interoperability and information sharing identified in the literature

Barriers	Literature
Technological: Incompatible technical and data standards, security concerns, rigid legacy systems, incompatible database designs and incompatible hardware and software	Lam, 2005; Lips, O'Neill & Eppel, 2011; Yang & Maxwell, 2011; Yang, 2012
Socio-technical: Failure to embed organisational and social issues such as culture technology.	Dawes, Cresswell & Pardo, 2009; Cordella & Lannacci, 2010; Pardo, Nam & Burke, 2011
Leadership: Lack of top leadership support at a political level, lack of supportive leadership at government agency level and unavailability of integration and interoperability project champions	Lam , 2005; Dawes, Cresswell & Pardo, 2009 Fan, Zhang & Yen, 2014
Resources: Costs associated with integration and interoperability projects such as implementation, maintenance and training costs.	Scholl & Klischewski, 2007; Dawes, Cresswell & Pardo, 2009; Yang & Maxwell, 2011; Dawes, Gharawi & Burke, 2012; Fan, Zhang & Yen, 2014
Skills: Lack of ICT skills and expertise especially in developing countries have been blamed for the slow digital transformation of government.	Heeks, 2002; Ifinedo, 2006; Ngulube, 2007; Imran & Gregor, 2010; Mutula & Mostert, 2010; Nkwe, 2012; Fan, Zhang & Yen, 2014
Organisational: Lack of standardised organisational processes, systems and policies, outdated and legacy government processes, under-preparedness of participating government agencies, rigid structures and lack of trust among government departments.	Lam, 2005; Luna-Reyes, Gil-Garcia & Cruz, 2007; Scholl & Klischewski, 2007; Lips, O'Neill & Appel, 2011; Young & Maxwell, 2011; Fan, Zhang & Yen, 2014.

Strategy: Lack of shared e-government goals, lack of ownership and governance, lack of a clear guidance and implementation plan and lack of a strategic plan spelling out the goal of the integration initiative**.**	Lam, 2005; Pardo, Nam & Burke, 2011
Governance: Concerns over governance of the complex digital and "smart" environment as well as issues of accountability and transparency.	Willke, 200; Scholl & Scholl, 2014
Legal & Policy: Concerns over information privacy, concerns over data ownership, lack of e-government policy supporting integration, jurisdictional issues preventing agencies from integrating their systems.	Guijarro, 2007; Scholl & Klischewski, 2007; Lips, O'Neill & Eppel, 2011; Otjacques, Hitzelberger & Feltz, 2007.
Political barriers: Rigid political structures, inefficiency in governance and corruption as a result of power and politics have been cited as some of the significant barriers preventing e-government integration and interoperability.	Ndou, 2004; Ifinedo, 2006; Maumbe, Owei & Alexander,2008; Schuppan, 2008; Yang & Maxwell, 2011; Lisboa & Soares, 2014; Scott, 2014
Stakeholder barriers: The inclusion and participation of stakeholders in transparent decision-making. Lack of stakeholder participation often leads to mistrust.	Scholl & Scholl, 2014; Letaifa , 2015
Trust: Fear of loss of reputation, fear that information may be used to sabotage the organisation, fear of legal repercussions as a result of sharing sensitive information, risk of losing a source of power and competitive advantage, mistrust in the quality of information, fear of loss of autonomy, fear of public scrutiny and the protection of rights of all interested parties may raise trust concerns.	Zhang & Dawes, 2006; Lips, O'Neill & Appel, 2011; Yang, & Maxwell, 2011 Fan, Zhang & Yen, 2014

2.11.1 Synthesis of E-government integration, interoperability and information sharing barriers

Using Institutional Theory as our framework of understanding, the barriers to integration, interoperability and information sharing can be categorised into (i) Regulative (ii) Normative and, (iii) Cultural-cognitive barriers.

2.11.1.1 Regulative barriers

Regulative barriers are experienced due to challenges in the development and implementation of policy and legislation as well as national strategies that influence the development of digital transformation. Policy and legislation are coercive mechanisms that can be used to enforce the desired behaviour such as compliance during the implementation of reforms in institutions. Policy and legislation also provide a legal basis and legitimacy in resource allocation,

implementing structures, processes and systems and appointment of leadership to coordinate government development. The absence thereof is a serious threat to the success of e-government integration, interoperability and information sharing initiatives.

2.11.1.2 Normative barriers

Normative barriers are experienced as a result of long-established organisational norms that maybe unsupportive to reforms or the failure to institutionalise norms that promote the implementation of new reforms. Low levels of skills may also result in failure to professionalise institutions.

2.11.1.3 Cultural-cognitive barriers

Cultural-cognitive barriers are experienced as a result of values systems, belief and culture that might be hostile to the institutionalisation of new reforms or transformation. These include the information culture, trust issues, stakeholder relations and the political culture.

Figure 7 categorises the barriers identified in the literature into regulative, normative and cultural-cognitive. The focus of this study is on institutional barriers (Regulative, Normative and Cultural-cognitive) rather than technology. Technology barriers, although briefly discussed in this study, were not the main focus of this study as they have been widely studied in the literature.

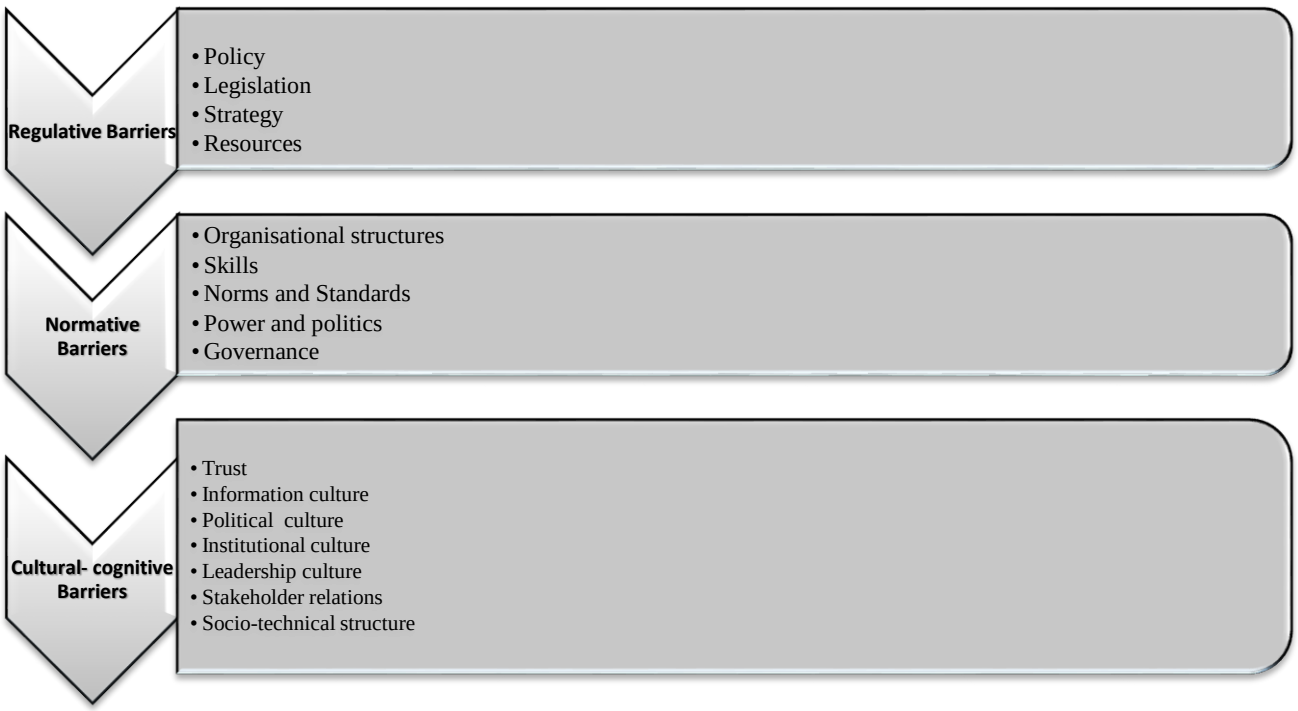

Figure 7: E-government integration, interoperability and information sharing barriers

2.12 Mechanisms to support integration, interoperability and information sharing

2.12.1 Government Enterprise Architecture (GEA)

Enterprise Architecture (EA) has been identified as a solution to the e-government integration, interoperability and information challenges faced by many governments (Hjort-Madsen, 2006; Janssen, 2012; Nasrawi & Ibrahim, 2013). Enterprise architecture goes beyond addressing e-government and interoperability and influences decision making on other aspects such as alignment of strategic objectives with information technology (IT) by ensuring coherence among the elements which ultimately impact e-government interoperability (Janssen, 2012). This view is reiterated by Hanna (2010:176) who argues that "the implementation of an EA program essentially involves aligning an organization's business processes with its IT information systems and directing both toward the requirements of end stakeholders, that is,

providing high-quality governing and managing the technology e-government services to businesses and citizens".

The implementation of Enterprise Architecture in government is referred to as Government Enterprise Architecture (GEA). The goal of Government Enterprise Architecture is to enhance interoperability between governments, support reuse and eliminate overlapping projects. Interoperability frameworks and enterprise architectures play a significant role in e-government interoperability by providing a framework for addressing technical and non-technical issues in e-government interoperability (Guijaro, 2007). Zachman (2008:1) defines enterprise architecture as "a structured set of descriptive representations relevant for describing an enterprise and being employed such that an instance of the enterprise can be created and such that the descriptive representations serve as a baseline for changing the instantiated enterprise". To achieve integration and efficiency in government services require the transition from fragmented and standalone systems towards architectures that are integrated (Janssen & Cresswell, 2005). It is clear from the literature that Government Enterprise Architecture is increasingly being used for aligning the core business processes and improving the management and governance of information systems in government.

Government enterprise architecture was found to have contributed to advancing e-government in developed countries. According to Hanna (2010), "many advanced countries have embraced the concept of EA, and their experience presents valuable lessons for developing countries". A good example is the Federal Enterprise Architecture Framework (USA) established in 1999. Hanna (2010) summarises the goals /objectives of the framework as follows:

- A road map for all government agencies to optimise their operations while creating an efficient IT environment.

- Organising federal information on a federal-wide scale
- Promoting information sharing among federal organisations
- Assist federal organisations to develop their IT investment processes.
- Provide a structured mechanism for identifying, organising, and managing the various components and activities of a federal enterprise. These EA components include business performance, processes, services, data, and technology.

The absence of EA in e-government projects implementation was found to have a negative impact on project costs, time and procurement in a study conducted in Greece (Antropoulus, Gerogiannis & Fitsilis, 2010). EA thus plays an important role in achieving efficiency in e-government initiatives. Nasrawi and Ibrahim (2013) identify several generic EA frameworks that can be adopted in e-government such as Zachman and The Open Group Architecture Framework (TOGAF). Cordella & Lannacc (2010) however cautioned against adopting prescriptive and readymade strategies which may not always be suitable and adequate to address complex issues in e-government. Nasrawi and Ibrahim (2013) recommended the selection of frameworks based on stakeholder requirements. Janssen (2012) summarised the goals of government enterprise architecture from the literature which include:

- Creating and enabling interoperability (data finding, access, and data exchange),
- Ensuring client orientation (client satisfaction).
- Creating flexible and agile e-government systems.
- Ensuring coherency (reduce complexity, independently managed parts, and dealing with size).
- Aligning strategy and technology (organizational structure and business processes) including communication.

- Support decision making (making IT investments, design decisions, guiding the design of new infrastructures, and developing capabilities).
- Enabling transformation (change support, vision, and strategy, and new infrastructure.

2.12.2 E-government interoperability frameworks

E-government interoperability frameworks are governmental policy cornerstones for implementing integrated e-government systems (Lampathaki, Tsiakaliaris, Stasis & Charalabidis, 2010). An e-government interoperability framework is a set of common standards, practices, guidelines, policies, best practices, vocabulary and principles for government institutions that want to collaborate in e-government initiatives (Lisboa & Soares, 2014). E-government interoperability frameworks are increasingly being recognised by governments worldwide as important tools for ensuring the success of e-government interoperability initiatives (Guijarro, 2007; Lisboa & Soares, 2014).

Adoption of interoperability frameworks by countries around the world has been attributed to financial and political pressures set by prominent and powerful organizations and institutions such as the European Commission, United Nations, and the World Bank (Lisboa & Soares, 2014). In Europe for example, the European Commission is spearheading the e-government interoperability agenda through the European Interoperability Framework initiative. The purpose of the European Interoperability Framework is:

- To promote and support the delivery of European public services by fostering cross-border and cross-sectoral interoperability;
- To guide public administrations in their work to provide European public services to businesses and citizens;
- To complement and tie together the various National Interoperability Frameworks (NIFs) in Europe.

The setting of agendas at such levels despite the advantage of ensuring a standardised and integrated approach to planning often places the needs of the group before those of the individual government. Without downplaying some of the advantages of an integrated and standardised approach, this has the potential to cause challenges as governments may lose some degree of autonomy in decision making.

A study on e-government interoperability framework adoption in Brazil concluded that the adoption of e-government interoperability frameworks, though desirable is often constrained by a complexity of factors, some which have been discussed above. These include: leadership constraints, technological constraints, human capital constraints, organisational constraints, strategy constraints, legal and policy constraints and information constraints among other things (Dos Santo & Reinhard, 2012). Governments need to address these issues to ensure effective interoperability frameworks (Lampathaki, Tsiakaliaris, Stasis & Charalabidis, 2010).

2.12.3 Standards and Standardisation

The adoption of common standards is a widely used approach in improving the interoperability of e-government information systems (Dos Santos & Reinhard, 2012). A standard is defined by Tassey (2000) as "a group of specifications to which all of the product elements, processes, formats, or procedures under its jurisdiction have to adhere". In the context of Information Technologies (IT), standardisation can be defined as the process in which two or more agents agree and adhere to a group of technical specifications of a system, their parts or their functionality, tacitly or as a result of a formal agreement (David & Greenstein, 1990). Standards play a crucial role in enabling or constraining the behaviour of participating agents in the future (Dos Santos & Reinhard, 2012).

There are also several kinds of standards that play different roles as identified by David and Steinmueller (1994), these include:

- **Reference standards and minimum quality standards** are about adhering to the content and level of certain defined characteristics.
- **Compatibility standards** ensure that components or sub-systems can successfully be incorporated, and be "inter-operable" with other constituents of a larger system of closely specified inputs and outputs.
- **Interface standards** whose purpose is to assure that a system built from "conforming" components originating from different sources will be functional.

Defining standards of these different types is important in building good standards. Ambiguous standards or poor definition of standards can thus be a barrier to e-government integration, interoperability and information sharing.

Interoperability Frameworks, Government Enterprise Architecture and Standards are important but not infallible mechanisms for addressing some of the institutional barriers to e-government integration and interoperability. They certainly help in addressing some of the technical, process and systems issues in e-government integration, interoperability and information sharing but may not be adequate in addressing non-technical institutional barriers prevalent in the digital transformation of government.

2.13 Summary

This chapter reviewed the literature on e-government integration, interoperability and information sharing so as to understand and conceptualise the problem being investigated. Evidence from the literature revealed that e-government integration, interoperability and

information sharing is complex especially in developing countries that are still battling with a range of social, political, economic and technological challenges that have prevented their progress. This has laid a foundation for the understanding of some of these institutional barriers in the South African context, a developing country that has made significant progress in the digital transformation of government but is still facing integration and interoperability challenges. The chapter discusses Government Enterprise Architecture, Interoperability Frameworks and Standards as some of the mechanisms for promoting integration, interoperability and information sharing.

The literature reveals many barriers to integration, interoperability and information sharing. Some of these are technological and the mechanisms put forward to promote integration and interoperability help to address those. Other barriers relate to the institution and can be understood in terms of Scott's three pillars of institutions as being barriers in the regulative, normative and cultural-cognitive domains. The next chapter (Chapter 3) discusses the use of theory in e-government and information systems in greater detail.

CHAPTER 3

THEORETICAL FRAMING

3.1 Introduction

This chapter introduces a discussion on the development and use of theory in information systems so as to assist in conceptualising the problem being investigated within existing theory. Institutional Theory and the Circuits of Power Framework which underpin this study are discussed with the aim of bringing out their value and application in this study and in information systems and e-government research. The main aim of this chapter is to frame this study within theory so as to increase rigour in a bid to produce new knowledge that is of intrinsic value to the information systems and e-government research community.

3.2 Theory in information systems

The meaning of "theory" in research has not been consistently and clearly defined despite some commonalities (Gregor, 2006; Weber, 2012; Bannister & Connolly, 2015). According to Gregor (2006), the inconsistency in the definition of theory is to some extent attributed to the philosophical and disciplinary bias. Gregor (2006:614) argues that "in general, philosophers of science writing in the tradition of the physical or natural sciences "positivist research" are likely to see theory as providing explanations and predictions and as being testable". In contrast, theory in "interpretive research" seeks to provide an understanding of phenomena or knowledge as socially constructed and influenced by human factors (Walsham, 1995; Gregor, 2006).

3.2.1 Defining theory in Information Systems

Several definitions of theory emerging from information systems literature are highlighted below. These definitions demonstrate the extent of inconsistency in how theory is understood in the information systems field.

Weber (2012:5) defines a theory as "a particular kind of *model* that is intended to *account* for some subset of *phenomena* in the real world. It is a *social construction,* an artefact built by humans to achieve some purpose. It is a *conceptual* thing rather than a concrete thing …It has a *concrete* manifestation as a neuronal pattern in some person's brain". Gregor (2002:3) further argues that "theory answers a human need to make sense of the world and to accumulate a body of knowledge that will aid in understanding, explaining, and predicting the things we see around us, as well as providing a basis for action in the real world". McDonald's (2010:260) definition of theory is anchored on academic acceptability, defining theory as an "articulated pattern of concepts and relationships that has gained stable, reliable status in academic disciplines through a process of research, debate and publication and which functions to describe, explain and predict phenomena". On the other hand, Johnston and Riemer (2014:4) adopt a more positivist definition, simply defining theory as "representational objects, models about the world, which explain and predict events in the world".

Gregor (2002) in her study exploring the meaning of theory in information systems used the word theory broadly to encompass models, frameworks, a body of knowledge and conjectures. This approach is however criticised by Weber (2012), a positivist who argues that not all models are theories.

Evidence from the literature suggests that the debate on what constitutes theory is an ongoing one in information systems research. The following conclusions are drawn:

- The philosophical foundation of the researcher largely influences the understanding of theory (positivist vs. interpretivist studies). Interpretivists aim to understand phenomena while positivists aim to predict or explain phenomena. This to a large extent influences the researcher's understanding and use of theory.
- One's understanding of what constitutes theory is influenced by disciplinary background and this understanding differs across disciplines e.g. natural science vs. social sciences. This is problematic for the information systems discipline which cuts across social and natural science referent disciples such as mathematics, computer sciences, management, psychology and sociology.

3.2.2 Function of theory in interpretive information systems research

Walsham (1995b) identifies three uses of theory in interpretive case study research which include (i) to guide to research design and data collection (ii) as part of an iterative process of data collection and analysis and (iii) as the outcome of research. Theory in research is important in providing rigour and helps in understanding the discipline being studied (Bannister & Connolly, 2015). Theory in interpretive research thus helps the researcher to understand the phenomena so as to better comprehend the world (Johnston & Riemer, 2014).

3.2.3 Types of theories in information systems

There are several types of theories identified in the literature. Gregor (2006) identified five types of theories in information systems described below:

3.2.3.1 Theory for analysing

According to Gregor (2006:622), "these theories analyse "what is" as opposed to explaining causality or attempting predictive generalizations". Theories for analysing are descriptive in

nature as they describe or classify specific dimensions or characteristics of groups, individual and situations. These theories are thus likely to be used in interpretive studies whose aim is often not to predict or generalise. These are ideal in interpretive studies where there is a strong belief that there are "multi realities" to a single phenomenon hence the need to analyse using classification and description.

3.2.3.2 Theory for Explaining

Theories for explaining primarily "explain *how* and *why* some phenomena occur" rather than making testable predictions (Gregor, 2006:624). Theories for explaining may provide an understanding of how, when, where and why phenomena occurred so as to bring an altered understanding of "how things are". These theories are likely to be used by positivists to explain phenomena (cause and effect) but have also gained popularity with interpretivists in explaining social phenomena.

3.2.3.3 Theory for predicting

The theory for predicting aims at making predictions of phenomena that is "*what will be* but not *why"* (Gregor, 2006:625). These theories as Gregor (2006:625) puts it are able to "predict outcomes from a set of explanatory factors, without explaining the underlying causal connections between the dependent and independent variables in any detail". Theories for predicting are thus most likely used by positivist's who believe in one reality and objectivity in scientific research.

3.2.3.4 Theory for explaining and predicting

The theory for explaining and predicting implies understanding both the underlying causes and prediction, as well as a description of theoretical constructs and the relationships among them. These theories can thus be used to answer the why, how, what will be and when phenomena in research. The use of the explaining and predicting theory is commonly popular in both the natural and social sciences (Gregor, 2006). These theories are thus likely to be used for both

interpretive research for understanding underlying causes and positivist research where theory is used to predict outcomes.

3.2.3.5 Theory for design and action

This type of theory says *how to do* something. It is about the principles of form and function, methods, and justificatory theoretical knowledge that are used in the development of information systems. Significant examples of design theory include methodologies such as the structured systems analysis methods and prescriptions for developing specific applications. These theories are likely used by design science researchers. Design science research has gained popularity in information systems research as "information systems are purposefully designed human-machine artefacts that significantly impact people, organizations, and society" (Von Alan, March, Park & Ram, 2004:75).

From the description of the five types of theories introduced by Gregor, one can deduce that the choice of theory is underpinned by a complexity of factors including; (i) the purpose of the study, (ii) the research questions and (iii) the methodology and research philosophy used in the study. The choice of theory is thus critical as part of the research process.

3.2.3.6 Weber's critique of the taxonomy of theories

The taxonomy of theories proposed by Gregor (2006) has been a subject of controversy. Weber (2012) in unpacking his understanding of theory concluded that some of the taxonomy of theories are not theories as claimed by Gregor (2006). Weber (2012) is of the opinion that the theories for analysing are *typologies* and not theories. Weber further argues that theories for design and action are *models* but not theories. Theories for explaining and theories for predicting may or may not constitute theories depending on how "rigorously their "parts" have been articulated and the qualities possessed by their whole" as Weber (2012:5) puts it. This

highlights the extent to which the understanding and use of theory in the information systems discipline will remain an important issue as the information systems discipline evolves.

3.2.4 Theory development in information systems

The development of new theories and refinement of existing theories in information systems research still remains a very weak area (Weber, 2012). The information systems discipline has often been criticised for lacking its own theories and over-relying on theories from reference disciplines such as computer science, organisational behaviour, sociology and psychology (Gregor, 2012; Weber, 2012). The lack of so-called "resident theories" has led to information systems being labelled 'a discipline in crisis' (Klein, 2003, Bakshi; 2006). Weber (2012) called for the need to develop theories in information systems and evaluating the quality of existing theories in information systems so as to improve knowledge production in the information systems domain. This study seeks to contribute to the development of theory in information systems by applying Institutional Theory and the Circuits of Power Framework, which are multidisciplinary theories in understanding phenomena in this study. The use of theories from other disciplines remains relevant and necessary in information systems. The interdisciplinary nature of information systems requires an understanding of technological, societal, organisational and political issues in understanding the management, governance, adoption, implementation and use of information systems.

3.3 Use of theory in e-government research

E-government research has been described as a field in its developmental stages (Yildiz, 2007, Heeks & Bailur, 2007). A complexity of issues has contributed to this. These include; a lack of methodological soundness, lack of an understanding of the political nature of e-government development processes, and lack of recognition of governments as complex political and institutional environments (Heeks & Bailur, 2007; Yildiz, 2007). Heeks and Bailur (2007:255)

further criticise e-government research for its weak use of theory arguing that " e-government literature has not yet been a generator or source of frameworks, let alone theories; it currently provides other researchers with just models or lists, particular with the four-stage web model of government."

Bannister and Connolly (2015:10) dismiss the notion that e-government has a theory problem arguing that "a deep theorisation of a multi-disciplinary field may not be possible. There is no evidence that this has been achieved in either public administration or in information systems, both of which are disciplines with longer pedigrees than e-government".

Despite the growth in e-government research over the past decade, the use of theory in e-government is still weak. Cox (2015) who reviewed 585 papers published in two major e-government journals (Government Information quarterly and Electronic Journal of e-government) concluded that research in e-government remains atheoretical and therefore lacks practical theoretical recommendations to the academic community. By making use of two well-established theories in understanding phenomena in e-government, this study is hoping to address this gap.

The use of theory in e-government research provides researchers with many lenses to view and understand issues such as integration and interoperability confronting e-government. Due to the multidisciplinary nature of e-government, a number of theories from disciplines such as organisational behaviour, computer science, economics, political science, sociology, management and systems engineering have been used in e-government research. It is against this background that Alcidine-Muñoz and Bolíva (2015:666) argue that "e-government research could be considered an eclectic field, involving diverse methodologies and disciplines,

each contributing specific theories and approaches". The adoption of theories from other fields is also one way of dealing with "theoretical immaturity" in e-government (Flak & Rose, 2005).

A review of the literature identified a number of theories that have used in e-government research. Due to the multidisciplinary nature of e-government, theories that have been used in e-government are too many to mention in this study. A few theories used in studies that are related to this study are discussed in the next sub-sections. The theories identified include Stakeholder Theory, Actor-Network Theory, Diffusion of Innovation Theory, Institutional Theory and Circuits of Power Framework. These theories were selected as they were identified in literature as commonly used theories to understand institutions, innovation, collaboration, leadership, power and politics and other key issues identified as central in this study. The reasons for not using some of these theories in this study are also discussed.

This study makes use of Institutional Theory and the Circuits of Power Framework. This study also adopts a multidisciplinary approach by using three disciplinary lenses in its enquiry (Information Systems, Political Science and Public Administration). The multidisciplinary nature of Institutional Theory, which has its roots in political science, sociology and economics, makes it relevant due to the multidisciplinary nature of e-government. The Circuits of Power Framework complements some of the shortcomings of Institutional Theory in understanding the problem being investigated as shall be discussed in this chapter.

Below I discuss some of the popular theories that have been used in studies that are similar to this one. Institutional Theory and the Circuits of Power Framework, used to underpin this study, are discussed in detail focusing on their merits and appropriateness in this study. I also discuss their application in this study as well as some of the theoretical constructs used in this study.

3.3.1 Stakeholder Theory

The increase in demand for better services has increased pressure for governments and public sector institutions to increase stakeholder satisfaction and increasing demands for better services by citizens (Government to Citizen e-government). This has led to an increase in stakeholder focused e-government (Flak & Rose, 2005; Fedorowicz, Gogan & Culnan, 2011). According to Rowley (1997:887), the growth in the use of stakeholder theory is partly because of its "emphasis on explaining and predicting how an organization functions with respect to the relationships and influences existing in its environment". Successful e-government adoption also depends on the identification of different stakeholder categories. Rowley (2011) identified the different categories of e-government stakeholders who include citizens, business, politicians, public administrators, government agencies, suppliers, IT developers and Non-Profit Organisations etc. Flak and Rose (2005) adopting Freeman's (1999) stakeholder approach described stakeholder theory as a set of management propositions, dependent on:

- *Normative (ethical) assumptions about the independent value of stakeholders' interest.* This proposition as reiterated by Pouloudi (1999) is not only used to help organisations survive but also because of moral obligations to consider a broad range of stakeholders. In this approach corporate social responsibility is one of the key drivers and decisions are taken not only in the interests of customers or shareholders but other stakeholders who are impacted by decisions.
- *Descriptive theoretical models (which can be used to analyse stakeholder situations).* Stakeholder Theory is **descriptive** as it "describes the corporation as a constellation of cooperative and competitive interests possessing intrinsic value" (Donaldson and Preston, 1995:66).
- *Instrumental aspects which (a) operationalize the theory in the form of management tools and techniques, and (b) investigate the effectiveness of these approaches.* This

approach is used by organisations to analyse their external environment while exploring how to manage their external relations with their multitude of stakeholders (Pouloudi, 1999).

The application of Stakeholder Theory which has its origins in management has gained some recognition in e-government research. Scholl (2001) reiterated that stakeholder theory has a role in e-government research particularly in two areas; (i) managerial decisions in e-government initiatives and (ii) understanding the increasing importance of the role of stakeholders in e-government and e-democracy. It is evident that stakeholder theory is particularly useful in addressing issues of governance and e-participation that have gained prominence in e-government.

Flak and Rose (2005:646) in their study investigating the potential of stakeholder theory in e-government justified the use of the theory in e-government research highlighting the following reasons:

- *A government can be conceptualized as the management of relationships and interests of societal stakeholders. ST [Stakeholder Theory] can serve as a way of scrutinizing hidden assumptions in e-government theory, and descriptive theoretical models in ST [Stakeholder Theory] can strengthen under-theorized best practice descriptions.*
- *As an applied field, e-government maintains a practical focus on managing successful technological innovation in a complex stakeholder environment... Stakeholder Theory might help to contribute theoretically sound conceptual tools and frameworks for e-government practice.*
- *Government agencies face 'increasing demands to run government like a business' but are normally budget-optimizing in relation to their various clients (or stakeholders) rather than profit-maximizing in relation to shareholders. ST [Stakeholder Theory]*

thus represents a better-fit type of management theory for the government context than conventional profit-maximizing management theories.

Significant examples of studies that used Stakeholder Theory include Fedorowicz, Gogan and Culnan (2010) who used stakeholder analysis in investigating barriers to inter-organisational information sharing. Fedorowicz, Gogan and Culnan (2010) in their study concluded that the identification of key stakeholders and their concerns and strategies to address their concerns is important in ensuring the success of e-government initiatives such as information sharing and interoperability.

One of the significant weaknesses of the theory identified by Flak and Rose (2005) is its failure to directly theorise the relationship between technology and stakeholder relationships which are fundamental to understanding e-government. Another concern identified by Flak and Rose relates to the political dimensions of e-government that do not translate directly from for-profit scenarios described in Stakeholder Theory. These weaknesses arguably contribute to making this theory less appropriate in this study. It falls short in addressing some of the issues that go beyond stakeholder influence in understanding e-government integration and interoperability in this study.

3.3.2 Diffusion of Innovation Theory

There has been increased pressure for the public sector to become more innovative in order to meet the demands of modern society (Gil-Garcia, Zhang & Puron-Cid, 2016; Sorensen, 2017). This has prompted researchers in e-government to gain interest in public sector innovation where the emphasis is on policy, technology and political innovation of the public sector (Sorensen, 2017). This has contributed to the growth in the use of the Diffusion of Innovation Theory in e-government research.

The Diffusion of Innovation Theory posits that innovations are communicated through channels between sources, which can either be individuals or institutions, over a period of time within a social system defined as "a set of interrelated units engaged in joint problem solving to accomplish a common goal" (Roger, 2003: 23). The social structure thus plays an important role in influencing the diffusion of innovation (Sahin, 2006). The Diffusion of Innovation Theory "emphasises the role of social networks in transmitting information about innovations" (Jun & Weare, 2010:497).

The theory is used in e-government research because increasingly e-government systems are being categorised as innovations (Chen, 2010; Henning, 2013). Governments have also been recognised as powerful forces in influencing innovation (King, Gurbaxani, Kraemer, McFarlan, Raman & Yap, 1994). This has prompted e-government researchers to use the Diffusion of Innovation Theory as a lens underpinning studies on innovation in e-government, the public sector, policy-making, e-participation and e-democracy.

The Diffusion of Innovation Theory contains useful constructs that can be used in this study mainly its emphasis on the social structure in the diffusion of innovations. It, however, fails to address issues that go beyond innovation. The scope of the study extends beyond the diffusion of innovation in government hence the theory falls short in this regard. This study looks at the adoption of integration, interoperability and information sharing. While social interactions between government departments are undoubtedly an influence in the adoption, they are not the only influence. The success of integration and interoperability also depend on regulative, normative and other cultural-cognitive elements in institutions.

3.3.3 Actor-Network Theory

Actor-Network Theory is a socio-technical theory that is based on the belief that purely technical or purely social relations are not possible in the light of increasing interaction, reliance and integration between technology and its surrounding social environment (Walsham, 1997). The theory according to Klecun (2004:259), “focuses on actors and their actions as they are performed in a particular time and place”. Walsham (1997:468) summarised some key concepts of the Actor-Network Theory (see Table 6).

Table 6: Key concepts of the Actor-Network Theory

Concept	Description
Actor (or actant)	Both human beings and non-human actors such as technological artefacts
Actor-network	Heterogeneous network of aligned interests, including people, organizations and standards
Enrolment and translation	Creating a body of allies, human and non-human, through a process of translating their interests to be aligned with the actor-network
Delegates and inscription	Delegates are actors who "stand in and speak for" particular viewpoints which have been inscribed in them, e.g., software as frozen organizational discourse
Irreversibility	The degree to which it is subsequently impossible to go back to a point where alternative possibilities exist
Black box	A frozen network element, often with properties of irreversibility
Immutable mobile	Network element with strong properties of irreversibility, and effects which transcend time and place, e.g., software standards

The growing popularity in the use of the Actor-Network Theory lies in its usefulness in describing how information systems are interwoven with organisational issues (Klecun, 2004). The use of Actor-Network Theory in information systems and e-government has been deemed appropriate in the implementation of information systems, e-government and technological innovation (Tatnall & Gidnill, 1999). In their study of the application of Actor-Network Theory in information systems research Tatnall and Gidnill (1999:963) concluded that "In refusing to accept the social/technical divide, and by treating human and non-human actors impartially, it avoids the essentialism, lack of heterogeneity and explanation by use of binaries that are inherent in many other methodologies".

The use of the Actor-Network Theory in information systems and e-government research is not without its critics. One of major weakness is that it is apolitical and lacks an evaluation approach that is critical in assisting researchers is assessing the opportunities presented by technology, its impact as well as dynamics in technological changes (Walsham, 1997; Klecun, 2004). Walsham (1997) in his study of the application of the Actor-Network Theory in information systems research identified four key weaknesses of the theory summarised below:

- **Limited analysis of social structures:** The theory pays little attention to broader social structures which influence the local Institutional Theory in information systems and e-government research.
- **An amoral stance**: Its stance on moral and political issues is problematic. The theory is not helpful in examining ethical and moral implications related to information systems.
- **The problem of generalised symmetry**: The symmetric treatment for humans and nonhumans in Actor-Network Theory has been the cause of considerable controversy. The challenge of Actor-Network Theory to the rigid separation of humans and

nonhumans is a very valuable one in this age of hybrids and blurred and negotiable boundaries, but this does not imply an acceptance of the extreme position of symmetry.

- **Problems of description**: The major problem of description that arises from a study which follows the methodological guidelines of Actor-Network theory. Actor-Network Theory emphasises the importance of detail, and thus the problem of selection for presentational purposes tends to be magnified.

Some of the weaknesses of the theory described above influenced the decision not to use it in this study. The apolitical nature of the theory, for example, is problematic given the influence of power and politics in institutional relationships and related issues which are core in this study. Paying little attention to broader social structures is also a significant weakness. The broader social structures which include relationships between agencies, political parties, civil society and communities play a key role in the successful digital transformation of government through integration and interoperability. In the following section, I discuss Institutional Theory which is used to underpin this study.

3.4 Institutional Theory in information systems and e-government research

The use of Institutional Theory, a theory that has its roots in sociology, political science and economics has gained prominence in information systems research. This can be attributed to the recognition that information systems are complex social systems that have multiple dimensions (Chae, 2002). Institutional Theory thus provides an "alternative view to the technical/rational theories concerning organizational behaviour" (Lawrence, 2005:60)

Developments in technology have led to an emphasis on information systems research that seeks to understand its impact on institutions and their immediate environments. This view is reiterated by Orlikowski and Barley (2001:19) who argue that the "IS field's practical interest

in the development, use, and management of information systems may have diverted analysts to lower levels of analysis and hence, away from studying how regulative processes, normative systems, and cultural frameworks shape the development of e-government systems the design and use of technical systems".

Institutional Theory is based on the belief that organisations are influenced by the internal and external social and cultural environment they operate in (Bjorck, 2004; Jacobson, 2009; Scott, 2014). Institutional Theory highlights the influence of culture on decision making and formal structures and is based on the belief that organisations, and the individuals who populate them, are shaped by rules, norms, values, beliefs, and taken-for-granted assumptions that are part of their own design (Barley & Tolbert, 1997). Institutional Theory according to Scott (2004:261), "considers the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behaviour". Institutional Theory helps in understanding the interlinked and complex relationships inherent among institutional mechanisms, technology, socio-economic context and organisational factors in institutions (Luna-Reyes & Gil-Garcia, 2011). It helps in understanding the impact of various organisational factors such as regulations and context. During the adoption and implementation of technology, applying Institutional Theory also helps in conceptualising the dynamic interplay between actors involved and structures in organisations (Nurdin, Stockdale & Scheepers 2012). Institutional theory in the context of this study and other similar studies in e-government and information systems has been used as a theory for analysing and explaining phenomena.

In recent years the use of Institutional Theory has gained prominence in investigating contentious issues in e-government. Significant examples include the adoption of e-government (Zheng, Chen, Huang & Zhang, 2013), adoption of innovation in e-government

(King Jun & Weare, 2011), understanding the complexity of e-government (Luna-Reyes & Gil-Garcia, 2011), governance and adoption of policy and implementation of new systems in government (Fountain, 2004; Lawrence, 2005; Cordella & Lannacci, 2010). Fountain (2004) drawing from the literature on Institutional Theory developed the technology enactment framework to study the relationships between technology and organisations, and how organisations enact ICT according to their social and cultural institutional attributes.

Institutional Theory thus "focuses on sustaining relationships between organizations and their environments, and establishing structures guiding social behaviour" (Zheng, Chen, Huang & Zhang, 2013:223). Institutional Theory posits that an organisations response to pressure is critical for its success and survival. For example, organisations are under pressure to achieve institutional legitimacy defined by Suchman (1995:574) as, "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions". This is particularly true of government whose acceptance is based on their legitimacy which is legally sanctioned, morally and socially governed.

Institutional Theory is a multidisciplinary theory and draws from fields such as organisational behaviour, political science, sociology and economics (Fountain, 2001; Hjort- Madsen, 2006; Scott, 2014). This makes it suitable for this study which employs a multidisciplinary approach in understanding issues in e-government. This notion is substantiated by Luna-Reyes and Gil-Garcia (2011:330) who note that "institutional theory is one of these more integrative approaches that recognize the importance of the context in which ICT is embedded and help to understand the influences of various factors on their selection, design, implementation, and use".

3.4.1 Defining Institution

There are several definitions of institutions that exist in the literature some of which are highlighted next. An institution is a "relatively enduring collection of rules that are relatively invariant in the face of turnover of individuals and relatively resilient to idiosyncratic preferences and expectations of individuals and changing external circumstances" (March and Olsen, 1995:90). Barley and Tolbert (1997:96) define an institution as "shared rules and typifications that identify categories of social actors and their appropriate activities or relationships". Institutions, therefore, represent "constraints on the options that individuals and collectives are likely to exercise, albeit constraints that are open to modification over time" (Barley & Tolbert, 1997:96). In defining institutions, this study adopts the definition by Scott who defines institutions as "comprising of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott, 2014:56). According to Scott (2014:56), "although institutions function to provide stability and order, they themselves undergo change, both incremental and revolutionary". Institutions are thus not static and are influenced by various pressures to transform through the institutionalisation process which is discussed below. What is evident from these definitions is that institutions are characterised by "shared rules", "stability", "social structures", "relationships", "accepted behaviour" and "processes". Significant examples of institutions include national government, universities and political parties etc.

3.4.1.1 Public organisations as institutions

Organisations that provide a service to the public can be conceptualised as institutions as they make and implement the rules, and standards, put in place sanctions for non-compliance, as well as processes to follow (Brunsson & Olsen, 1997; Thoenig, 2003). Public institutions are constantly confronted by changes in the dynamic environment and their responses to such changes are influenced by a complexity of the technological, social, political and

economic environment in which they operate (Weerakkody, Dwivedi & Irani, 2009). This is critical in this study which seeks to understand institutional barriers confronting the development of e-government in a developing country context confronted by a myriad of social, economic and technological challenges. Institutional Theory provides a useful theoretical lens for investigating issues confronting government in transforming and responding to changes brought about by the advent of the "smart society".

3.4.1.2 Institutional isomorphism

Institutional Theory also recognises the role of external forces in organisations' legitimate behaviours (DiMaggio & Powell, 1983; Zheng, Chen, Huang & Zhang, 2013:223). This will afford this study a lens through which internal and external forces in e-government integration, interoperability and information sharing can be reasonably understood. The theory according to Zheng et al. (2013:224) (referencing earlier work by DiMaggio and Powell (1983) posits that "organizations face pressures to conform to shared notions of appropriate forms and behaviours, as violating them may call into question the organization's legitimacy, and thus affect its ability to secure resources and social support". Isomorphism is a "constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (DiMaggio & Powell, 1983:149). It is also concerned with understanding "how an innovation, once made, becomes widely adopted throughout the organizations in a specific field" (Clegg, 1989:227).

The three mechanisms through which isomorphic change occurs identified by DiMaggio and Powell (1983:151) include (i) coercive isomorphism, (ii) normative isomorphism and (iii) mimetic isomorphism. Coercive isomorphism stems from formal and informal political influence to institutionalise certain rules and practices by organisations as a result of pressure from other organisations that are its stakeholders. Normative isomorphism is associated with

the professionalisation of organisation actors. Mimetic isomorphism results from mimicking standard responses to uncertainty and the need to minimise risk.

3.4.1.3 Internal and external pressures in government institutions

In the external environment, public institutions are under pressure to achieve political legitimacy, which requires that they conform to social norms and expectations concerning organisational functions (DiMaggio & Powell, 1983). Studies have also found that private and public institutions adopt technology due to mimetic pressure to follow best practice and latest trends (Bjorck, 2004, Zheng, Chen, Huang and Zhang, 2013). Stakeholder pressure also confronts government organisations and has a bearing on how they respond to the adoption and implementation of new innovations associated with e-government (Jun & Weare, 2010). The legal and policy framework also plays a major role as external forces that influence the adoption and implementation of new innovations such as e-government (Bjorck, 2004).

Internally, institutions are confronted by forces such as social norms, values and belief systems that influence the institution's transformation, adoption of change or innovation ability. In earlier studies of Institutional Theory and leadership, Biggart and Hamilton (1987) highlighted the importance of leadership in legitimising organisational principles, institutionalisation as well as the importance of strategies of leadership in considering the normative basis of social relationship in institutions. Biggart and Hamilton (1987) are inclined to the socio-cultural perspective stressing that leadership is embedded in social and cultural values and beliefs. The influence of the internal social system on institutional structures is well documented in studies such as Mayer and Rowan (1977) and Tolbert and Zucker (1999). Institutionalisation which is discussed in this chapter is also as an outcome of some of these internal institutional forces (isomorphic pressures).

3.4.2 Institutional pillars

According to Scott (2014), Institutional Theory is anchored on three pillars; regulatory, normative and cultural-cognitive as detailed in Table 7. Scott's three pillars framework has been widely recognised as useful in understanding forces that act on institutions. Scott's three pillars framework is based on the belief that regulative mechanisms, cultural cognitive mechanisms and normative mechanism are critical elements of institutions. The three institutional pillars play a complementary role and situations where the pillars are misaligned are likely to lead to the effectiveness of institutions (Scott, 2014). Thus for regulative and normative mechanisms to be effective, these must be supported by sanctioning power as well as cultural-cognitive elements such as cultural beliefs (Scott, 2014).

Table 7: Three pillars of institutions (Scott, 2014:60)

	Regulative	Normative	Cultural-Cognitive
Basis of compliance	Expedience	Social obligation	Taken-for-grantedness shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive schema
Mechanisms of logic indicators	Coercive	Normative	Mimetic
	Instrumentality	Appropriateness	Orthodox
	Rules	Certification	Common beliefs
	Laws	Accreditation	Shared logics of action
	Sanctions		Isomorphism
Affect	Fear/Guilt/ Innocence	Shame/Honour	Certainty/ Confusion
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible Recognisable Culturally supported

3.4.2.1 Regulative pillar

The regulative pillar is anchored on the premise that institutions regularise and constrain behaviour through rules, rewards and punishment to influence future behaviour. Legitimacy, in this case, is therefore legally sanctioned (Jacobson, 2009). Regulative systems

that characterise the regulative pillar exhibit high values in three dimensions highlighted below (Scott, 2014:60).

- *Obligation – the extent to which actors are bound or obey because their behaviour is subject to scrutiny by external parties*
- *Precision- the extent to which the rules unambiguously specify the required conduct*
- *Delegation - the extent which third parties have been granted authority to apply the rules and resolve disputes*

3.4.2.2 Normative pillar

The normative pillar places emphasis on "normative rules that introduce a prescriptive, evaluative, and obligatory dimension into social life" (Scott, 2014, 66). Legitimacy in the normative pillar is therefore morally governed (Jacobson, 2009). Normative theorists emphasise the stabilising roles of internalised and imposed norms and social beliefs in institutions (Scott, 2014). Normative systems in institutions define goals and objectives and dictate acceptable ways to attain them by imposing constraints on social behaviour as well as empowering and enabling social action (Scott, 2014).

3.4.2.3 Cultural cognitive pillar

The cultural-cognitive pillar places emphasis "on the role played by the socially mediated construction of a common framework of meanings" (Scott, 2014:70). A shared understanding culminates in "a cultural supported basis for legitimacy" (Jacobson, 2009:6). According to Scott (2014:67), "cultural cognitive emphasises that internal interpretive processes are shaped by external cultural frameworks". Cultural systems operate at multi levels which are nested enabling the broad cultural frameworks to diffuse and influence individual beliefs (Scott, 2014).

Cultural beliefs which form an important part of the cultural-cognitive pillar in institutions are often diverse and are often contested especially in times of organisational change or social disturbances or disorganisation (Scott, 2014). This provides a useful lens for understanding transformation and other dynamics affected by common beliefs and cultural systems in institutions.

3.4.3 Institutionalisation

An institution is the outcome of the institutionalisation process (Tolbert & Zucker, 1996). Institutionalisation "is the creation of structured, stable and social integration of unstable and loosely organised technical activities" (Scott, 2014:146). The institutionalisation of innovation is triggered by coercive isomorphic pressures such as legislation, (mimetic isomorphism) market forces or normative (technological changes) that might require the adoption of new norms and standards.

The institutionalisation process involves three processes (Habitualisation, Objectification and Sedimentation). In Figure 8 the process of institutionalisation proposed by Tolbert and Zucker is highlighted.

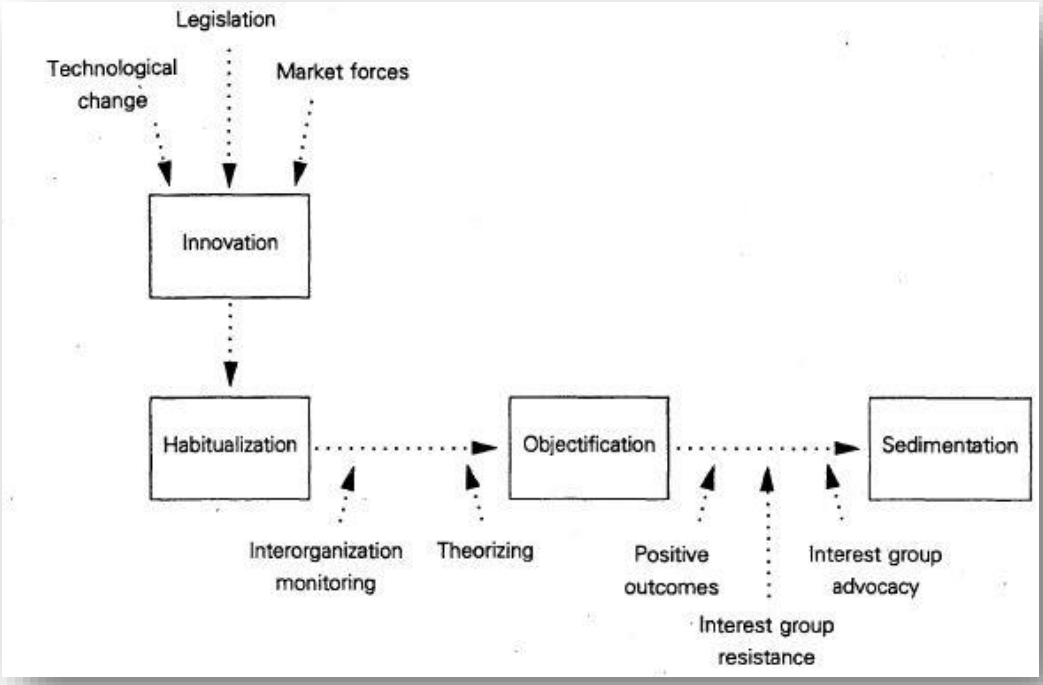

Figure 8: Institutionalisation process (Tolbert & Zucker, 1996)

Habitualisation involves the creation of new structures in response to a specific organisational problem or set of problems which are formalised in policies and procedures of the organisation or organisations facing similar problems (Tolbert and Zucker, 1996). These processes result in structures that can be classified as being at the pre-institutionalisation stage. The impetus for innovation at this stage is imitation (mimetic isomorphism).

The **objectification** process involves the development of some degree of social cohesion among organisational leadership concerning the value of a structure, and the increasing adoption by organisations on the basis of that consensus (Tolbert & Zucker, 1996). In institutional theory, scholars embracing the cultural cognitive pillar "emphasise the role of objectification of shared beliefs in institutionalisation" (Scott, 2014:148). The objectification process results in semi-institutionalisation. The impetus for innovation during the

objectification stage is both imitation and normative at this stage is the transition stage between pre-institutionalisation and semi-institutionalisation.

Sedimentation is characterised "both by the virtually complete spread of structures across the group of actors theorized as appropriate adopters, and by the perpetuation of structures over a lengthy period of time" (Tolbert and Zucker, 1996:184). In the sedimentation process objectified beliefs often become embedded in the institution's routines, documents and artefacts (Scott, 2014). This process is what constitutes full institutionalisation and is critical in the survival of established structures. The impetus for innovation in the Sedimentation stage is normative as desired values systems, routines and norms become embedded in the institution.

In Table 8 the stages of institutionalisation and comparative dimensions are summarised by Tolbert and Zucker (1996).

Table 8: Stages of institutionalisation and comparative dimensions (Tolbert & Zucker, 1996)

Dimension	***Pre-institutionalisation stage***	***Semi-institutionalisation stage***	***Full institutionalisation stage***
Processes	Habitualisation	Objectification	Sedimentation
Characteristics of adopters	Homogeneous	Heterogeneous	Heterogeneous
Impetus of innovation	Imitation	Imitative/ normative	Normative
Theorization activity	None	High	Low
Variance implementation	High	Moderate	Low
Structure failure rate	High	Moderate	Low

One can argue that understanding the institutionalisation process is critical in the adoption of initiatives such as e-government integration and interoperability as these can be considered innovative due to their role in improving processes, systems and structures in government. Some of the barriers associated with interoperability and interoperability can be reasonably explained by understanding the institutionalisation process, as shall be unpacked in later chapters.

3.4.4 Application of institutional theory in e-government and related studies

Institutional Theory is increasingly gaining popularity in information systems and e-government research and has been used to interrogate complex issues in institutions. Institutional Theory offers e-government researchers an opportunity to interrogate issues affecting public institutions through many lenses by viewing public institutions through three lenses, (i) as pillars of social order, (ii) as outcomes of societal values and (ii) as self-constructed social systems (Thoenig, 2012).

In their study of institutional factors in information technology innovation, King, Gurbaxani, Kraemer, McFarlan, Raman and Yap (1994:162) argued that "the role of institutions must be considered an essential component in any theory of innovation. The institutional power to influence and regulate can be linked to ideologies governing supply-push and demand pull approaches to innovation in an effort to account for possible institutional interventions". They further emphasised the importance of the role of government as the "paradigmatic institution in the IT innovation process".

Governments are among one of the most complex institutions characterised by complex structures, bureaucracy and slow transformation (Zheng, Chen, Huang & Zhang, 2013). This

is perhaps the reason why government institutions are often lagging in the adoption of innovative technologies necessary for moving towards being "smart". Evidence from the literature suggests that governments are often confronted by a range of external forces such as political, social, economic, environmental, legal pressure and internal institutional pressure that slow down transformation and transition. Public institutions are more susceptible to internal and external institutional pressures as they operate in uncertain environments (Jun & Weare, 2010). This is arguably one of the reasons why Institutional Theory has gained prominence in e-government research especially when examining complex phenomena such as institutional transformation

3.5 Power, Politics and Institutionalisation

Institutional Theory according to Clegg, Courpasson and Phillips (2006:11) "lost its focus on power after Meyer and Rowan (1977) and DiMaggio and Powell (1983) initiated its renaissance by asking why there are so few types of organizations. Organizations, they suggested, are as they are not for efficiency reasons (as contingency functionalist theorists had argued) but for reasons of social construction". More so, research studies applying DiMaggio and Powell left out power by concentrating on mimetic isomorphism whilst downplaying the coercive and normative (Mizruchi & Fein, 1999; Clegg, Courpasson& Phillips, 2006).

More recent studies on institutions have moved away from the traditional focus of exploring the role of isomorphic pressures in institutional transformation and have increased the attention given to exploring the role of power and politics in the evolution of institutions (Lawrence, 2008). According to Lawrence (2008:170), "the relationship between power and institutions is an intimate one. Institutions exist to the extent that they are powerful - the extent to which they affect the behaviours, beliefs and opportunities of individuals, groups, organizations and societies". In this study, we explore how power dynamics and politics in institutions influence

institutional transformation or the institutionalisation of reforms. Power, according to Clegg, Courpasson and Phillips (2006:6), is "inseparable from interaction and thus all social institutions potentially are imbued with power".

The concepts of power and politics more often than not have been used interchangeably in many studies, including those in information systems. This perhaps stems from how these two concepts are defined and understood. Below we discuss the definitions of power and politics and how these will be applied in this study.

3.5.1 Power and institutions

According to Lawrence (2008:174), "power is a property of relationships such that the beliefs or behaviours of an actor are affected by another actor or system". Power has also been discussed by mainstream organisation theorists in terms of 'illegitimacy', seeing power as something exercised by organizational members not formally sanctioned with authority" Gordon, Kornberger and Clegg (2008:16). French and Raven (1959) highlighted the 5 common types of power:

- Reward power which is based on the ability of one to reward.
- Coercive power which is based on one's ability to mediate punishment.
- Legitimate power based on one's legitimate right to prescribe the desired behaviour. Legitimate power is derived from the formal rules of authority (Mintzberg, 1983; Silva, 2007).
- Referent power based on one's personal characteristics or traits.
- Expert power derived from one's knowledge or expertise.

In understanding power dynamics in organisations, Clegg, Courpasson & Phillips (2006) emphasize five major distinctions among mainstream organisational approaches:

1. Power and efficiency should be simultaneously analysed as fundamentally embedded in the social fabric of power as both a concept and a set of practices.
2. Power and discourses are intermingled in so far as they constitute the political structure of organisations through diverse circuits of power. Discourses play a role in shaping structures in organisations and "provide the means for ordering the political structure".
3. Making sense of various forms of political economy in organisations by understanding how leaders in organisations sustain power and the structures of dominance they strive to develop and legitimise.
4. Understanding that organisations are "witness to the emergence of notions of popular rather than singular sovereignty". Sovereignty is defined as 'the highest power of command'.
5. Finally, they argue that power must be seen in its contemporary political context which cannot be separated from the contexts in which it is embedded.

3.5.2 Politics and institutions

On the other hand, 'Politics' is an 'essentially contested' concept, in the sense that it has a number of "acceptable or legitimate meanings". Mintzberg (1983:72) defined politics as "Individual or group behaviour that is informal, ostensibly parochial, typically divisive, and above all, in the technical sense, illegitimate – sanctioned neither by formal authority, accepted ideology, nor certified expertise". Similarly, Silva (2007) described politics as actions outside the scope and formal ways of governance (Silva, 2007). Despite its negative connotation, the study of politics remains critical in information systems research (Silva 2007). Clegg, Courpasson and Phillips (2006:3) reiterate the need to view politics as not necessarily "nasty and backstabbing". Contrary to Mintzberg notion of politics as illegitimate and not sanctioned by formal authority, Ball (1993), views politics as legitimate. Ball argues that "political

authority is the recognition of the right to rule irrespective of the sanctions the ruler may possess" (1993:29). Heywood (2013:3) in his study of politics identified four different approaches to defining politics as summarised below:

- ***Politics as the art of government****: The exercise of control within society through the making and enforcement of collective decisions.*
- ***Politics as public affairs****: The second and broader conception of politics moves it beyond the narrow realm of government to what is thought of as 'public life' or 'public affairs'. In other words, the distinction between 'the political' and 'the non-political' coincides with the division between an essentially public sphere of life and what can be thought of as a private sphere.*
- ***Politics as a compromise and consensus****: Politics is seen as a particular means of resolving conflict: that is, by compromise, conciliation and negotiation, rather than through force and naked power.*
- ***Politics as Power****: This definition of politics is both the broadest and the most radical. Rather than confining politics to a particular sphere (the government, the state or the 'public' realm), this view sees politics at work in all social activities and in every corner of human existence.*

In this study, I understand politics in its broader sense by adopting the concept of politics at work in all social activities (politics as power). E-government is a complex phenomenon whose scope extends beyond government and impacts other social spheres.

Various approaches such as behaviouralism, rational-choice theory, institutionalism, feminism, Marxism and post-positivists approaches have been used in studying politics. It is beyond the scope of this study to discuss and explain these approaches.

Table 9 below summarises the approaches for defining and study of politics proposed by Heywood (2013).

Table 9: Approaches to defining politics (Heywood, 2013)

	Politics as an arena	**Politics as a process**
Definitions of politics	The art of government Public affairs	Compromise and consensus Power and the distribution of resources
Approaches to the study of politics	Behaviouralism Rational-choice theory Institutionalism	Feminism Marxism Post-positivist approaches

In this study, I adopted institutionalism in understanding institutional change brought about by the adoption and implementation of information systems and e-government. In the institutional approach, political institutions are thus seen "as sets of 'rules', which guide or constrain the behaviour of individual actors" (Heywood, 2013:15). This approach is adopted in this study as understanding norms, regulations and cultural-cognitive elements which can be seen as "sets of rules" is central in understanding barriers to the institutionalisation of information systems.

3.5.3 Power and politics in information systems research

The role of power and politics in understanding the complexity in the adoption or implementation of information systems has been explored in the literature, although the literature in this area remains sparse compared to other social factors such as culture (Peszynski & Saundage, 2004). Studies such as Markus (1983) and Peszynski and Saundage (2004) have explored the role of power and politics in the implementation of information systems. Markus (1983) concluded that the political variant can assist in explaining and predicting events when implementing information systems in complex organisations. Similarly, Peszynski and Saundage (2004) also argued that that power and politics are clearly visible and have a

significant role in the implementation of information systems in organisations. The multiple paradigms and disciplinary perspectives that have been used to study the relationship between power and information systems have added to the complexity of studying power and building theory (Jasperson et al., 2002). Similarly, Clegg, Courpasson & Phillips (2006:6) argue that "the broad literature on power is diverse and complex and its ramifications for the study of organizations have remained largely unexplored". This is a gap in theory that this study is hoping to contribute to.

3.6 The Circuits of Power Framework

One of the theoretical gaps in the study of power in institutions over the years has been the simplification and the use of under theorised conceptualisations (Clegg, Courpasson & Phillips, 2006). In his study on epistemological and theoretical challenges for studying power and politics in information systems, Silva (2007) argued that an interpretive study of power, applying meta-theories, should be complemented with a specific theoretical framework such as the Circuits of Power Framework. According to Silva and Backhouse (2003:294), the Circuits of Power Framework is "grounded in organizational theory and social sciences and integrates different perspectives on power. Each perspective unravels a different dimension of power that complements and enriches the others – hence it is a profound tool for analysing a complex phenomenon such as power". It offers information systems researchers "a set of strong epistemological principles to make sense of a complex and mostly hidden phenomenon, i.e. power and politics." (Silva, 2007:180). The Circuits of Power Framework conceives of power as fundamentally strategic (Silva & Backhouse, 2007). The Circuits of Power Framework in this study and other similar studies is used as a theory for analysing and explaining phenomena. The episodic circuit considers power as being causal. The theory can therefore be used as a theory for predicting.

The Circuits of Power Framework integrates several concepts of power known as the circuits of power namely; (i) episodic, (ii) social and (iii) systemic integration circuits to account for the process of institutionalization (Clegg, 1989; Silva & Backhouse, 2007). For innovation to be institutionalised, it must become embedded in the three levels of the organisation that correspond with the three circuits of power (episodic, social integration, and systemic integration) (Clegg, 1989). Each circuit is defined by a different type of power: causal in the episodic circuit, dispositional for social integration, and facilitative for systemic integration (Clegg, 1989). The three circuits are defined below:

- The **episodic circuit** considers power as being causal. It also concerns the ability of A to make B do something, which they may not otherwise have done. In this instance "the use of power as a resource is direct and visible" (Buchanan & Badham, 2009:46).
- The **circuit of social integration** places emphasis on dispositional power, with its main elements being the rules that govern meaning and membership in organizations (Silva, 2007). It also focuses on institutional isomorphism (coercive, normative and mimetic pressures) (Clegg, 1989:227).
- The **circuit of systematic integration** considers power as being facilitative, that is the ability of power to achieve desired outcomes or goals in an organisation. It is defined by "the techniques of production and discipline of the organization" (Backhouse and Silva, 2003:300).

The circuit framework is described in Figure 9.

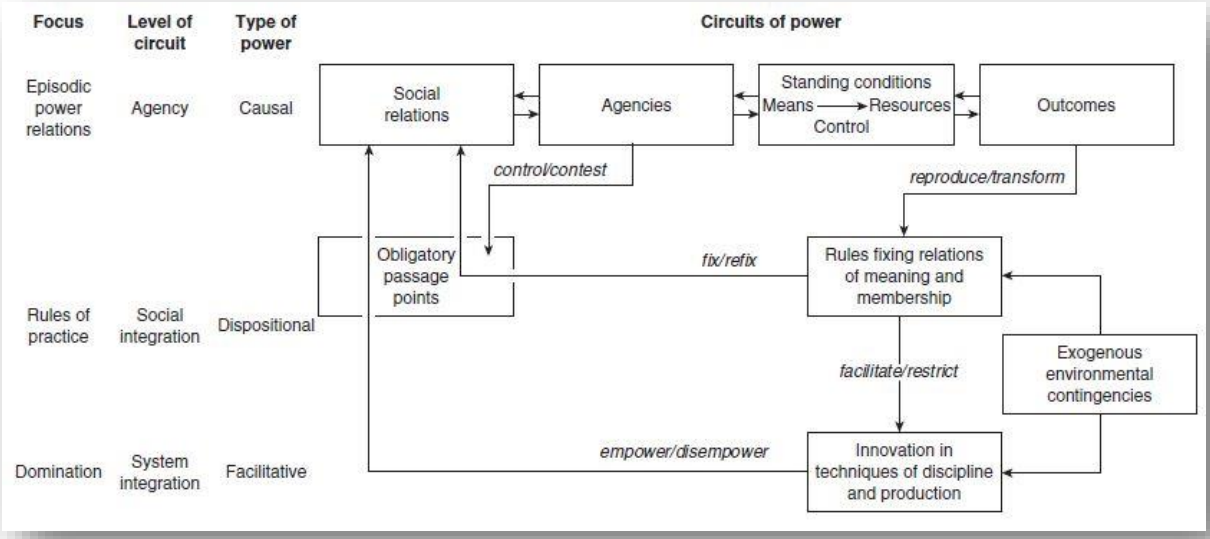

Figure 9: Circuits of Power Framework (Clegg, Courpasson & Phillips, 2006:242)

Silva and Backhouse (2007) used the Circuits of Power Framework developed by Clegg (1989) to explore the role of power in the institutionalisation of information systems. They analysed the three circuits of power and concluded that the institutionalisation of information systems requires the integration of the three circuits of power. They further argue that institutionalisation of information systems is achieved when the "system is no longer contested and it has become a routine in the organization ... and resistance will arise when the system is perceived as a threat to the users or if it disrupts working practices; and will continue to be resisted as long as it does not achieve social and systemic integration" (p321).

Based on these Circuits of Power I derived the following questions to frame the analysis in this study (see Table 10).

Table 10: Application of the Circuits of Framework in Framing the study questions

Circuit	Questions
Episodic	• *Who is influencing transformation in government?* • *What institutional mechanisms have those influencing transformation adopted to influence the transformation of government?*

Social Integration	• *What are the desired norms and cultural-cognitive elements in the transformation process?* • *What institutional norms and cultural-cognitive elements have led to the non-effectiveness of coercive power in institutional transformation?*
Systematic Integration	• *What systems and structures have been established to facilitate the success of transformation initiatives in institutions?* • *What mechanisms have been implemented to enforce compliance?* • *How effective are the coercive mechanisms in promoting compliance and desired behaviour?*

3.6.1 Integrating the circuits framework and institutional perspective in understanding institutional transformation

This study integrates Institutional Theory and the Circuits of Power Framework in understanding isomorphic pressures influencing the transformation of institutions. It builds on the work of Silva and Backhouse (2003) and Silva (2007) who argue that in addressing the theoretical and epistemological and challenges presented by the study of power and politics in information systems, the use of meta-theories should be complemented by a specific theoretical framework. In this study institutional theory fell short in explaining phenomena related to power and politics in the transformation of institutions. An integrated theoretical approach to studying phenomena such as power allows researchers to present different perspectives of its components as well as contradictions and paradoxes that otherwise would not be evident in one-dimensional studies (Jasperson et al., 2002; Silva & Backhouse, 2007). The third research sub-question in this study addresses power and politics in institutional transformation. Concepts from both Institutional Theory and the Circuits of Power Framework were used to understand and explain phenomena. A review of the literature also found no evidence of work that has looked at the relationship between the Circuits of Power Framework and Scott's three Pillars of Institutions Framework in understanding the institutionalisation of information systems in e-government. This study therefore appears to be the only one that has used the two theoretical perspectives.

3.7 Summary

This chapter discussed the role of theory in research focusing on the role of theory in information systems and e-government research. It was found that the use of theory in information systems research particularly in e-government is still low. This has led to research in e-government being labelled lacking "practical theoretical contributions" and lacking value to the academic community.

Some theories that are relevant in this study, Diffusion of Innovation Theory, Stakeholder Theory and Actor-Network Theory, were also discussed focusing on how they have been used in previous studies, their strengths as well as their weaknesses, some which made them not appropriate for this study. This study uses Institutional Theory and the Circuits of Power Framework as its theoretical underpinning in an attempt to close the gap of lack of use of theory in e-government in a bid to increase rigour in producing new knowledge in the e-government and information systems discipline. This chapter discussed the relevance of Institutional Theory and the Circuits of Power Framework with a focus on how the two theories are applied in this study in addressing the three research questions shaping this study. In the next chapter (Chapter 4) I discuss the methodology used in this study.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

In Chapter 3 the theories that are being used to underpin this study were explained. I now turn to a discussion of the research methodology.

A methodology is a strategy which influences the choice and use of particular methods and is "concerned with why, what, from where, when and how data is collected and analysed" Scotland (2012:9). In social sciences, the choice of methodology is influenced by the nature of the social phenomena or problem being explored (Noor, 2008). This chapter discusses various research philosophies or paradigms used in information systems research, including justifying the choice of paradigm used in this study. The research approach and design, data gathering techniques and population sampling techniques used in conducting the study are also discussed with the aim of justifying their appropriateness in addressing the research problem. The data analysis technique used to understand and make sense of phenomena being investigated is also discussed.

The methodological choices made in this study were as a result of their appropriateness in addressing the research problem by helping answer the research questions below that shaped this study.

1. What institutional barriers is the government facing in its bid to improve information sharing, integration and interoperability of its systems?
2. What institutional mechanisms do governments implement to address barriers to integration, interoperability and information sharing?

3. How do Institutional Theory and the Circuits of Power Framework aid our understanding of the digital transformation of political and social institutions?

The strengths and some of the challenges experienced in using the methodology adopted in this study are discussed so as to justify its appropriateness. I also discuss some of the measures put in place to overcome some of the challenges of the methodology chosen.

4.2 Research philosophy and paradigms

Research is based on three philosophical assumptions (Chua, 1986) (see Table 11). According to Chua (1986), the first assumption relates to beliefs about knowledge which are categorised into; (i) epistemological and (ii) methodological assumptions. Epistemological assumptions determine what can be considered as acceptable truth by "specifying the criteria and process of assessing truth claims" while methodological assumptions highlight the relevant and acceptable methods for collecting evidence in research.

The second assumption relates to beliefs about physical and social reality and focuses on ontological assumptions concerned with what constitutes reality, human intention and rationality and societal order/conflict.

The third assumption relates to the relationship between theory and practice and how knowledge is applied in practice. The three philosophical assumptions collectively are what underpins research paradigm.

Table 11: Philosophical assumptions in research adopted from Chua (1986)
Philosophical assumptions in Research
A. Beliefs about Knowledge • Epistemological • Methodological
B. Beliefs about Physical and Social Reality • Ontological • Human Intention and Rationality • Societal Order/Conflict
C. Relationship between Theory and Practice • Application of knowledge in practice

According to Gupta and Mukhopadhyay (2014:110), the research paradigm refers to a "shared set of ontological and epistemological assumptions that unite a community of scholars". Kuhn (1970: viii) on the other hand defines paradigm as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners". Underpinning these "universally recognised scientific achievements" are standard guidelines and rules for scientific practice or conducting research (Kuhn, 1970; Gupta & Mukhopadhyay, 2014). The research paradigm plays a pivotal role in research by guiding the researcher in identifying the appropriate methodology and standards for evaluating the quality of research and methodology to be used (Crossan, 2003; Gupta & Mukhopadhyay, 2014).

4.3 Research paradigms in information systems

Orlikowski and Baroudi (1991), referencing the work of work Chua (1986), advocate for the use of three major paradigms in information systems research, namely the positivist, interpretive and critical paradigms. Research in information systems is still dominated by the two major paradigms, interpretivist and positivist. Earlier research in information systems mostly made use of the positivist paradigm (Orlikowski & Baroudi, 1991) although there has been some growth in interpretive research (Myers & Klein, 1999). Critical research is one of

the emerging paradigms in information systems research but still remains the least popular of the three paradigms (Myers & Klein, 2011). The three paradigms are discussed below.

4.3.1 Interpretive research

In social science research, the interpretive research paradigm is based "on an ontology in which reality is subjective, a social product constructed and interpreted by humans as social actors according to their beliefs and value systems" (Darke, Shanks & Broadbent, 1998:276). Interpretive research has been gaining ground in information systems research despite the continued dominance of positivist research (Walsham, 1995b; Myers & Klein, 1999). According to Orlikowski and Baroudi (1991:155), interpretive studies are based on the assumption that "people create and associate their own subjective and inter-subjective meanings as they interact with the world around them". Interpretive researchers thus attempt to understand phenomena by accessing the meanings that participants assigned to them.

According to Schwandt (1994:118), interpretive research provides a rich insight into "the complex world of lived experience from the point of view of those who live it". Myers and Klein (1999:69) argue that in interpretive studies the assumption is that our "knowledge of reality is gained only through social constructions such a language, consciousness, shared meanings, documents, tools, and other artefacts". In information systems research, the purpose of interpretive studies is to generate an understanding of the "*context* of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham, 1993:4).

The lack of rigour and the failure to use the "scientific approach" has been used as the basis for criticising the interpretive research paradigm (Gupta & Mukhopadhyay, 2014). Interpretive researchers have in recent years begun to focus on enhancing rigour in a bid to deal with such

shortcomings (Myers & Klein, 1999; Gupta & Mukhopadhyay, 2014). Walsham (1995b), for example, argues that in interpretive research, generalisation is achieved through the development of new theory and concepts, the contribution of rich insight into phenomena being studied and drawing of specific implications. Strategies used to increase rigour in this study are discussed later.

4.3.2 Positivist research

According to Rubin and Rubin (2012:15), positivist research assumes that there is "a single, objective reality that can be observed and measured without bias using standardized instruments". The positivist paradigm, according to Burrell and Morgan (1979), "characterise epistemologies which explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent dements". The aim of positivist research is primarily to test theory in a bid to enhance predictive understanding of phenomena (Orlikowski & Baroudi, 1991). The positivist paradigm is the dominant paradigm in the natural sciences (Orlikowski & Baroudi, 1991).

Positivist research is based on the assumption that "things can be studied as hard facts and the relationship between these facts can be established as scientific laws ... such laws have the status of truth and social objects can be studied in much the same way as natural objects" (Crossan, 2003:49). This has often led to criticism of the use of the positivist paradigm in social sciences. The positivist paradigm has often been accused of failing to take into account context and other human and social factors in research and "disregards the individual and collective biases of the researchers as well as the subjects" (Gupta & Mukhopadhyay, 2014:09). The weakness of the positivist paradigm in social research has arguably led to the growth of the interpretive research paradigm (Orlikowski & Baroudi, 1991; Gupta & Mukhopadhyay, 2014). The positivist paradigm still continues to be the dominant approach information systems

research but recent years have seen the growth of other paradigms such as the interpretive and critical paradigm (Orlikowski & Baroudi, 1991; Myers & Klein, 2011).

4.3.3 Differences between positivist and interpretive research paradigms

Table 12 summarises the differences between positivist and interpretive research identified by Gupta and Mukhopadhyay (2014).

Table 12: Differences between interpretive and positivist research (Gupta& Mukhopadhyay, 2014:111)

	Positivist	Interpretive
Ontology	Single reality or can be apprehended probabilistically	Reality is constructed and can be multiple.
Epistemology	Knower and known are independent	Knower and known are inseparable
Axiology	Inquiry is value-free	Inquiry is value driven
Inductive/ Deductive	Deductive	Inductive
Generalization	Time and context-free Generalisation is possible	Generalisation is not possible hence focus is on understanding

4.3.4 Critical research

The goal of research according to the critical paradigm is to discover and address social injustices (Orlikowski & Baroudi, 1991; Rubin & Rubin, 2012). Critical research thus aims to challenge "the status quo, through the exposure of what are believed to be deep-seated, structural contradictions within social systems, and thereby to transform these alienating and restrictive social conditions" (Orlikowski & Baroudi, 1991:5). In information systems, critical research focuses on the investigation of social issues such as power, values, culture and

freedom in the development, implementation and impact of information systems (Myers & Klein, 2009:17).

Myers and Klein (1999) identify three elements of critical research. The three elements are (i) insight (ii) critique and (iii) transformation. The element of insight is concerned with interpretation and gaining insight into social systems of phenomena being researched. The element of critique calls for critical researchers to challenge the status quo focusing on power forces anchoring accepted interpretations. The element of transformation is concerned with the improvement of human and social conditions of living.

4.3.5 Choice of paradigm

This study assumes an interpretive paradigm as it seeks to generate an understanding of the social, political, technological, environmental and economic context inherent in e-government integration, interoperability and information sharing research. The phenomena being investigated in this study as reflected in the research questions calls for the need to "understand the context" (Walsham, 1993:4). Rich insights into the complex relationships and issues surrounding e-government integration and interoperability were gained by adopting the interpretive paradigm. The role of the researcher in interpretive research is to interpret his or her own understanding of phenomena hence the principle of objectivity common in positivist research will not be applied in this study.

4.4 Research approach

This study employed the qualitative approach defined by Kothari (2009:3) as "the subjective assessment of attitudes, opinions and behaviour. Research in such a situation is a function of the researcher's insights and impressions. Such an approach to research generates results in non-quantitative form or in the form which is not subjected to rigorous quantitative analysis."

The research paradigm or philosophy, research goal and subject, research questions, researcher's experience and personal beliefs arguably play a major role in influencing the choice of research approach (Gupta & Mukhopadhyay, 2014). The nature of the research problem and questions in this study demand a qualitative approach as the goal is to assess and understand complex social, technological, organisational and other issues in e-government.

Qualitative research relies on non-numeric data, unlike quantitative research that relies on numerical and statistical data (Bhattacherjee, 2012). The use of the qualitative approach in information systems (IS) is supported by Myers (1997) who argues that qualitative research methods have increased in popularity due to the shift of information systems research from a technological focus to organisational issues. The primary focus of the discipline of information systems remains understanding ICT in the context of organisational change (Plummer, 2001).

4.5 Research design

A research design is a conceptual structure for conducting the research and provides for the efficient collection of relevant data (Kothari, 2009). An interpretive case study research design was used as the primary method of inquiry in this study. An interpretive case study research is an "inductive technique where evidence collected from one or more case sites is systematically analysed and synthesised to allow concepts and patterns to emerge for the purpose of building new theories or expanding existing ones" (Bhattacherjee, 2012:97). The case study method is gaining popularity in information systems research because of the shift of information systems research from a technical perspective towards an organisational and social perspective where the emphasis is the study of social and organisational issues such as culture, behaviour and structure.

The case study research design allows for the intensive study of a phenomenon over time within its natural setting and allows for the use of several data collection methods. Documents, interviews, observation and secondary data are used to collect the relevant data about the phenomena being studied (Kothari, 2009 & Bhattacherjee, 2012).

The case study method was chosen as it is deemed appropriate for studying and understanding complex phenomena and can be used to build knowledge or reinforce findings from previous studies (Baxter & Jack, 2008; Kothari, 2009). The complexity of the e-government integration and interoperability problem being investigated in this study justifies the use of this approach. Plummer (2001:3) notes that the case study method is appropriate in information systems research because of its "usefulness in investigating the relationship between information systems and such intangible concepts such as organizational performance and success".

This study seeks to contribute to building theory in information systems and e-government. This justifies the use of the case study which is relevant in building theory, especially where theory is in formative stages (Yin, 2009). Research in e-government is dominated by research from developed countries. This study presents an opportunity to share knowledge and experiences from a developing country to grow the discipline and its body of knowledge. Having multiple world views is critical in contributing new knowledge especially in social science and interpretive research where context plays a significant role in shaping one's reality and understanding of the world around them.

The use of the case study design is not without its critics. According to Darke, Shanks & Broadbent (1998), the researchers experience and background may result in bias in the data collection and analysis process as well as the interpretation of results. In this study, my

experience and understanding of the South African social, economic, political and technological context were used to understand the phenomena being investigated.

The case study method is often criticised due to its data analysis methods that are often not well established. Qualitative methods can produce huge volumes of unstructured data which makes analysis difficult and time-consuming (Darke, Shanks & Broadbent, 1998). To address this challenge, I used my information and knowledge management experience in the public sector and knowledge of the e-government policy and legislative framework to select the most relevant documents for inclusion in the analysis. I also participated in key policy development forums to keep abreast of developments in policy and legislation. This minimised the time spent in searching and analysing documents. To avoid exclusion of relevant documents, participants were requested to highlight any documents that might assist in understanding the problem being investigated.

4.5.1 Case description

South Africa is an exemplary and unique case of a developing country government that has embraced ICT and e-government for inclusive socio-economic transformation. The government has developed policies, legislation, standards and strategies aimed at digitally transforming government and society (see Chapter 5). In Africa, South Africa is one of the three countries that are considered to have a high e-government development index as reported in the 2018 United Nations e-government survey. Tunisia and Seychelles are the other two. Like any other developing country, South Africa continues to face challenges in integrating and interoperating e-government systems as part of its digital transformation strategy aimed at transforming government into a “smart government” that governs effectively and efficiently and delivers services to improve the lives of its citizens. In response, the government has come up with measures aimed at improving integration, interoperability and information sharing.

In 2010, the South African government adopted twelve measurable outcomes that were to become the focus of policy between 2010 and 2014. Outcome 5 was to develop "a skilled and capable workforce to support an inclusive growth path". Output 1 of Outcome 5 was to "establish a credible institutional mechanism for skills planning". The following were identified as sub-outputs:

- *Sub-output 5.1.2: Develop mechanisms to interface operational systems (management information systems and databases etc.)*
- *Sub-output 5.1.3: Develop strategic management information systems (strategic intelligence systems capability and business intelligence information reporting system)* (DHET, 2012).

It is against this background that the South African government launched the Labour Market Intelligence Partnership (LMIP) project in 2012. The LMIP project is a unique undertaking designed to inform and support evidence-based skills development policy and strategy in South Africa to build "a credible institutional mechanism for skills planning" Department of Higher Education and Training, 2012:2). Speaking at the launch of the LMIP project, the Minister of Higher Education and Training noted that, "put simply, this project aims to set up systems for reliable data indicating skills needs, supply and demand in our labour market in a manner that will enable our country, including government and business to plan better for human resources development needs of our country" (Department of Higher Education and Training, 2012:2).

The LMIP project aims to support the government's goal of building "a credible institutional mechanism for skills planning". One of the challenges that the South African labour market is currently facing is that there is no institutional mechanism that provides credible information and analysis with regard to the supply and demand for skills (Department of Higher Education

and Training, 2012). Moreover, "while there are a number of disparate information databases and research initiatives, there is no standardised and integrated information system for skills supply and demand across government" (Department of Higher Education and Training, 2012:2).

To achieve Outcome 5, the Department of Higher Education and Training (DHET) entered into a strategic partnership with the Human Sciences Research Council (HSRC). The LMIP project, therefore, presented a unique opportunity to conduct a study to understand institutional barriers government to integration, interoperability and information sharing in government.

4.5.2 Justification for using a single case

Findings from single case studies have been criticised for lack of generalisability (Yin, 2009). The proposed single case study meets some of the criteria for considering single case studies proposed by Yin (2009).

1. *Testing theory* so as to confirm, challenge or further develop existing theory. This study is an interpretive study and its purpose is not to test theory but rather uses theory to understand phenomena. Institutional theory is used as a lens to understand barriers to e-government (see Chapter 3). This case study also provides an opportunity to develop or extend the use of socio-technical theories in understanding complex socio-historic, socio-cultural, socio-economic factors surrounding technology design, adoption and implementation in e-government.
2. Where "the case represents an *extreme case* or a *unique case*" (Yin, 2009:48). South Africa is a unique and exemplary case of a government in a developing country context, particularly in sub-Saharan Africa that has made significant progress in implementing e-government. The LMIP is also a unique case in a developing country context where few such projects to integrate and interoperate systems across government departments

have been undertaken before. This presented an opportunity to assess and understand information sharing, integration and interoperability issues in government.

3. Where the case is "a *revelatory case"*. This is where "an investigator has an opportunity to observe and analyse a phenomenon previously inaccessible to social science inquiry" (Yin, 2009:48). Being a participant in the LMIP project gave me an opportunity to access information that could have been otherwise difficult to obtain. My understanding of the South African socio-economic context and public service in this case study provided an opportunity to better analyse social phenomena central in this study.

Moreover, "single cases provide for in-depth investigations and rich descriptions" (Darke, Shanks, & Broadbent, 1998:281). This is important especially in this study whose purpose is to enrich our understanding of phenomena in a given context, in this instance a government in a developing country context that has embraced ICT and e-government.

It is important to note that this study is single case in the sense that it looks at South Africa as a developing country, but since its focus is on integration and interoperability at national government department levels, it looks at the experiences of several government departments in South Africa which cut across the seven clusters of government. The clusters are as follows:

- Infrastructure Development Cluster
- Economic Sectors and Employment Cluster
- Governance and Administration Cluster
- Human Development Cluster
- Social Protection and Community Development Cluster
- International Cooperation, Trade and Security Cluster
- Justice, Crime Prevention and Security Cluster

Although the aim of an interpretive study is not to generalise, findings, in this case, are applicable to other government departments as the sample is representative of departments across the seven clusters. Some of the departments, for example, the Department of Home Affairs and the Department of Science and Technology belong to more than one cluster which further strengthens cross-pollination of views. Other developing countries especially in Africa with a similar context to South Africa can also learn some lessons from the case study.

4.6 Data collection

Data collection is an important step in gathering evidence to help address the problem identified in this study. Semi-structured interviews, documents and a review of the literature were used for collecting data. The use of more than one approach in collecting evidence ensured that no relevant data was excluded, taking into account the complexity of the problem being investigated. The use of multiple sources of data was also critical in corroborating findings which increased rigour. Multiple sources of evidence were also required in this study due to the complex nature of the problem being investigated.

4.7 Semi-structured interviews

Semi-structured, also known as focused or guided interviews were used for gathering primary evidence in this study. Semi-structured interviews "focus attention on the given experience of the respondent and its effects" (Kothari, 2009: 98). Semi-structured interviews have been praised for providing rich information and insights into complex issues especially where people are involved as they allow the researcher to probe issues that may not have been obvious for the researcher (Blaxter, Hughes & Tight, 2006).

This study seeks to understand how institutions, including actors in them, impact the success of digital transformation by understanding the institutional barriers confronting the

government. Insights into institutions and their behaviours are better understood by having a meaningful conversation with actors in them. Interviews provide an excellent opportunity for understanding organisations and can help the researcher find out people's perceptions. Issues of culture, leadership, organisational practices, trust and human behaviour that are central in this study are often not well documented as they are embedded in institutional systems, values, norms, beliefs and relationships. This view is reiterated by Blaxter, Hughes & Tight (2006) who argue that interviews are a useful technique for collecting data easily accessible when using other techniques. Some of the advantages realised from interviews in this study are summarised below:

- They presented an opportunity to probe further some issues that came through the analysis of documents.
- Insights were gained from first-hand accounts of the complexities of e-government integration, interoperability and information sharing from the people who are part of those institutions.
- They revealed some useful information on issues that are central to this study but had not been envisaged or had been missed in conceptualising this study.

Interviews are however not without their own shortcomings. The bureaucracy involved in seeking approval to conduct interviews in some of the selected government departments is one notable challenge encountered. This ranged from delayed responses and non-responses from some of the government departments selected to participate in this study.

Interviews have been criticised for being time-consuming, especially where the study involves larger samples (Kothari, 2009). Careful selection of the sample size, including the number of government departments and participants helped in dealing with this challenge.

Another weakness with interviews is the risk of getting varied responses which often makes coding and analysis of data difficult (Turner, 2010). The use of semi-structured interviews to guide the interviews helped eliminate this weakness, common with most unstructured interviews. The interview guide was also structured according to key themes which made the coding of results easier.

4.7.1 Population of the study

The population of the study refers to a totality of subjects that exhibit similar characteristics and from which the sample of the study is selected (Polit & Beck, 2004). First and foremost, the population in this study included national government departments and senior and executive managers belonging to the Senior Management Service echelon in those departments. The senior and executive managers selected are responsible for policy, e-government, information systems, information technology, information management and intergovernmental relations in national government departments in South Africa.

4.7.1.1 Sampling design

Sampling design is described by Kothari (2009) as a technique or procedure adopted by the researcher in selecting items for inclusion in the study. Judgmental sampling also known as purposive sampling was used for selecting the relevant government departments and key informants to participate in this study as the author is familiar with the organisation of government. In judgemental sampling, the sample is selected at the discretion of the researcher based on their relevancy in answering the research questions in the study (Kothari, 2009).

Ten (10) departments were identified as key partners of the Department of Higher Education and Training in the delivery of outcome 5 of the government's 12 outcomes informing policy. The ten departments contribute data and information on skills supply and demand, formulate

policies that impact on skills demand and supply, and are also key users of the labour market information (Human Sciences Research Council, 2014). The ten departments are:

1. Department of Basic Education
2. Department for Economic Development
3. Department of Finance
4. Department of Home Affairs
5. Department of Labour
6. Department of Performance Monitoring and Evaluation
7. Department for Public Service and Administration
8. Department of Rural Development and Land Reform
9. Department of Science and Technology
10. Department of Trade and Industry

Five of the ten departments who are part of the Labour Market Intelligence Partnership project and one whose role is overseeing ICT and e-government development in the South African government participated. The departments that participated in this study included:

- The Department of Trade and Industry – LMIP participant
- The Department of Higher Education and Training – LMIP participant
- The Department of Home Affairs – LMIP participant
- The Department of Science and Technology – LMIP participant
- The Department of Public Services and Administration – LMIP participant and ICT and e-government coordinator
- The Department of Telecommunications and Postal service – ICT and e-government coordinator.

Invitations to voluntarily participate in this study were sent to eight departments and two government agencies, six of the government departments are key delivery partners in Outcome 5 (a skilled and capable workforce) to which the Labour Market Intelligence Partnership project is a key output. Of the eight departments, only seven responded and gave the approval to be included in the study. Of the seven that agreed to participate, only six were included due to the non-availability of invited officials to participate on behalf of the Department of Labour. One official cited their demanding work schedules and the relevancy as the reason for not participating while the other two invited participants did not respond despite several attempts to reach them via telephone and email.

The two departments that did not respond to the request were the Department of Basic Education and Statistics South Africa. The participation rate was satisfactory to gather enough evidence for in-depth analysis in this study. The minimum of six departments set in the sampling frame in the original research proposal was also met. Table 13 summarises the response rate.

Table 13: Response rate of government departments and agencies

Department / Agency	**Responded**	**Participated**
Department of Higher Education and Training	Yes	Yes
Department of Home Affairs	Yes	Yes
Department of Public Services and Administration	Yes	Yes
Department of Telecommunications and Postal Service	Yes	Yes
Department of Trade and Industry	Yes	Yes
Department of Science and Technology	Yes	Yes
Department of Basic Education	No	No

Department of Labour	Yes	No
Statistics South Africa (Agency)	No	No
SITA (Agency)	No	No

The Department of Labour is one of the departments that had accepted an invitation to participate in this study. It was later removed as a participant after non-responses from officials invited to voluntarily participate. This brought the total participating entities to six. This, however, did not impact the study as the responsibility of coordinating the labour market information system is now the responsibility of the Department of Higher Education and Training. In a telephonic conversation with one of the officials from the Department of Labour invited to participate, they noted that the Department of Higher Education and Training in 2009 was better placed to respond to questions. The responsibility of coordination of the Labour Market Information System was transferred to the Department of Higher Education and Training since its formation in 2009.

Moreover, the State Information Technology Agency (SITA), a government agency tasked with enhancing interoperability and integration in government failed to respond to the request to participate in this study. The omission of SITA did not impact the study due to its focus on interoperability and integration barriers from the perspective of national government departments, not agencies or state-operated enterprises.

Response rates of invited participants (individuals)

To meet the minimum of ten participants set in the original sampling frame set out in the proposal, 21 invitations were sent to potential participants from the seven government departments that had accepted. Given the small population of the targeted participants (28

officials of the senior management echelon in government departments participating in the LMIP project), the minimum of ten participants was considered reasonable to reach the point of saturation. Judgemental sampling and snowball sampling was used to select the 21 participants. Snowball sampling was applied to select additional participants who might not have been obvious. The majority were from organisations participating in the LMIP project and individual participants who were recommended. Snowball sampling "seeks to take advantage of the social networks of identified respondents to provide a researcher with an ever-expanding set of potential contacts" (Atkinson & Flint, 2001:1). Of the 21 only 12 accepted the invitation and participated in the study.

To enrich the study, an additional three (3) experts (2 academic and 1 public sector expert) were invited to participate in the study. Only two (1 academic and 1 public sector expert) accepted the invitation and participate in the study. This brought the total number of participants to 14 (see Table 14).

Table 14: Participants response rates

	DHET	**DHA**	**DTI**	**DST**	**DPSA**	**DTPS**	**DOL**	**Experts**	**Total**
Sample	3	3	3	3	3	3	3	3	**24**
Response rate	3	2	2	3	1	1	0	2	**14**
Response rate (%)	100%	66,6%	66,6%	100%	33,3%	33,3%	0%	66.6%	**58.3%**

Participants' designation

This study targeted officials who are part of the Senior Management Service in government (Deputy Director Generals, Chief Directors and Directors) responsible for the development and implementation of policy decisions in government. The reason for targeting officials in the

Senior Management Services was due to the fact that the major focus of this study is the implementation of policy. In the South Africa government, officials belonging to Senior Management Services are responsible for policy implementation. The majority of the participants (66.6%) were Directors in their respective departments. Those at the level of Deputy Director General or Government Chief Information Officer constituted 8.3%. Chief Directors constituted 16.6 %. One participant holding the position of Assistant Director was requested to sit in the interview by their Chief Director and was recognised as a participant as they took part in responding to the questions. Data from the two participants was considered as two separate responses because of their disciplinary backgrounds and perspectives. The participants' designations in their respective government departments are summarised in Table 15 below. This is excluding the two experts included in this study.

Table 15: Participants designation

Designation	**Number of participants**
Deputy Director General / Chief Information Officer	1
Chief Director	2
Director	8
Assistant Director	1

Participants' expertise

E-government is a multidisciplinary field that cuts across many disciplines such as information systems, public administration and political science. To understand the development and implementation of e-government, this study targeted experts with diverse disciplinary backgrounds that are relevant to e-government. These ranged from ICT, information systems, e-government, policy, information and knowledge management and intergovernmental relations. The majority of participants (50%) were e-government and ICT/Information systems experts responsible for e-government / ICT policy implementation in the public sector. Table

16 summarises the profile of officials who participated in this study in terms of their primary area of expertise.

Table 16: Participants expertise	
Expertise	**Number of participants**
E-government/Information Systems/ ICT	7
Intergovernmental relations	1
Information and Knowledge management	3
Policy and Research	3

4.7.1.2 Interview procedure

A formal letter detailing the purpose of the research was sent to participants and their organisations requesting them to voluntarily take part in this study (See Appendix B). An audio recorder was also used to record interviews with the permission of the participants. Blaxter, Hughes and Tight (2006) argue that the use of a recording device has a significant advantage as it enables the interviewer to give their full attention to the interviewee with minimum distractions. Brief notes were also taken during interviews to highlight key issues that emerged. Interviews were conducted at the participants work environment for the convenience of the participants.

4.8 Documentary evidence

Documentary evidence was also used to collect relevant data for this study. Documents such as policies, legislation, government strategies and government reports addressing issues of e-government integration, interoperability, information sharing, ICT and related issues published between 1998 and 2018 were used as sources of data. This period coincides with the rapid development of e-government in South Africa after the 1998 Presidential Commission report on the transformation of the Public Services identified ICT as a key driver of transformation government. Strategic plans and annual reports of government departments

instrumental in the implementation of the digital transformation agenda were also used. Documentary evidence was chosen in this study because documents such as policies, legislation and strategies contain rich and accurate information that is often difficult and expensive to collect using other data collection methods such as questionnaires, not to mention the risk of collecting distorted information, especially where facts are required. Documentary evidence was used to address all the three research questions shaping this study.

The focus was on understanding digital transformation, ICT development, e-government and related policies, government strategies and legislation and how they support integration, interoperability and information sharing related issues. Issues central to e-government interoperability such as policy innovation, trust, privacy and security were also a focal point. In addition, the study looked for evidence on how institutional mechanisms (coercive, normative and cultural-cognitive) have influenced interoperability, integration and information sharing. Use of these institutional mechanisms by the government of South Africa in addressing the barriers to integration, interoperability and information sharing was explored.

Documents are an important source of evidence in research as they often contain rich data and information which might shed more light on the primary evidence collected (Blaxter, Hughes & Tight, 2006). Documentary analysis using Institutional Theory and the Circuits of Power Framework as theoretical lenses provided evidence on how the South African government is addressing some of the institutional barriers to e-government integration and interoperability identified in the literature (research question 2).

The use of documents as sources of evidence had its own advantages. These include:

- The ease of collecting the documents central to this study. Most which were easily available online. Having worked in the public sector, my knowledge of the ICT policy and legislative framework assisted in identifying the relevant documents for inclusion in this study.
- The collection of documents for inclusion in this study was less time consuming as the documents were readily available. This also significantly lowered the costs of data collection.
- Policy, strategy and legal documents used were a more accurate representation of government's plans and priorities and facts such as budgets and expenditure on projects related to digital transformation, ICT and e-government compared to relying on people's accounts.

The use of secondary documents for research has been criticised. Some of the disadvantages experienced in using secondary documents in this study are highlighted below.

- Documents used were created for different purposes, not for academic research. Some of the information critical for research purposes in some cases was missing. This prompted the use of other means such as interviews or the literature to find the missing information.
- Some documents were less elaborative in some of the issues at the core of this study. This left a lot of uncertainty which had to be verified through interviews.
- Some of the documents analysed were very long which made the analysis of such documents a tedious exercise. To address this, I focused my analyses on the relevant sections after having acquainted myself with the purpose and structure of the documents.

4.9 Data Analysis

The goal of qualitative data analysis was to understand phenomena and gain insights rather than explaining or predicting phenomena (Bhattacherjee, 2012; Suter, 2012). Data analysis as described by Darke, Shanks & Broadbent (1998:285), consists of three activities:

(i) *Data reduction refers to the process of selecting, simplifying, abstracting and transforming the raw case study.*

(ii) *Data display include narratives, matrices, graphs, tables and various charts.*

(iii) *The conclusion drawing/ verification stage involves drawing meaning from data and building a logical chain of evidence.*

Qualitative data collection and analysis in this study was done simultaneously as recommended by Bhattacherjee (2012) and Suter (2012). This was important in identifying some of the gaps in the data collected. The missing pieces of data were then sought after to ensure accurate results. Notes were made during the data collection stage as written notes help guide the researcher in conceptualising issues that address the problem and answer research questions (Suter, 2012).

Thematic analysis was used to analyse data in this study. Thematic analysis can be defined as "a general approach for analysing qualitative data that involves identifying themes or patterns in the data" (Wagner, Kawulich & Garner, 2012:231). Coding of interview and documentary data was done to categorise evidence for easy analysis. The study used both closed (deductive) coding and open (inductive) coding. Deductive coding was used to identify themes emerging theory and literature. Inductive coding, on the other hand, was used to identify new themes that emerged during the collection and analysis of data. Throughout data collection and analyses various themes emerging from this study were identified and unique codes were assigned.

4.9.1 Core themes identified from theory and literature

Twelve initial themes were identified from theory and the literature. The themes are discussed next.

Leadership

Leadership emerged as one of the major barriers to e-government integration, interoperability and information sharing initiatives identified from a review of the literature (see Section 2.9.10). Leadership in e-government remains a key driver of success in the digital transformation of government. Sub-themes under leadership include political leadership, management and project management.

Governance

Governance is a core theme identified from a review of the literature. Chourabi et al. (2012) identified governance as a critical component of smart initiatives. Governance is also closely related to the leadership theme. Sub-themes under governance include transparency, accountability and corruption. Related themes include leadership, institution, organisation and resources.

Institution

Understanding the "institution" is at the centre of understanding transformation or the institutionalisation of reforms in institutions. Institution was a core theme identified from Institutional Theory in Chapter 3. Sub-themes include goals and mandates, agency and actor.

Organisation

Understanding how organisations function is critical in promoting the successful implementation of reforms. "Organisation" is one of the main themes identified in this study. Sub-themes identified include structures, systems and processes. Institution, regulation, norms and culture are some of the related themes.

Trust

Trust as a concept has been widely been studied in e-government. Al-Omari and Al-Omari (2006) developed an e-government trust model highlighting the building blocks of trust in e-government. Trust was therefore adopted as one of the main themes in this study. Institution-based trust, process-based trust and leadership-based trust are the three sub-themes identified.

Regulation

Regulation was identified as one of the key themes from the literature. Scott (2014) identified regulation as one of the key pillars of institutions. DiMaggio and Powel (1989) also identified regulation as a form of coercive isomorphism that acts on institutions and influences institutionalisation process. Policy, legislation and procedures are sub-themes.

Norms

Norms is also a core theme that was identified from theory. Scott (2014) identified the normative pillar as one of the core pillars of institutions and understanding institutionalisation. DiMaggio and Powel (1989) also identified normative isomorphism as part of the isomorphic pressures influencing the institutionalisation process in institutions. Standards, ethics, principles and guidelines are sub-themes under norms.

Culture

Culture, a theme identified from institutional theory emerged quite strongly in the study. In Scott's three pillars of institutions, the cultural-cognitive pillar is based on the belief that institutions and the behaviour are influenced by the cultural context which is socially mediated (Scott, 2014). The issues of culture emerged strongly as a government like most institutions can be considered as social systems that are shaped by cultural-cognitive elements such as beliefs and values systems. Values, belief systems and practices are some of the key sub-themes.

Power

In this study, power emerged as a core theme in understanding the digital transformation of government and the institutionalisation of reforms. This theme was identified from the Circuits of Power Framework by Clegg (1989). Sub-themes under power include referent, episodic, coercion, compliance and legitimacy.

Politics

Politics has been studied in information systems to understand the adoption and implementation of information systems. Significant examples include Markus (1983), Silva and Backhouse (2003) and Silva (2007). Politics is a core theme related to power that also helped in understanding barriers surrounding the institutionalisation of reforms. Sub-themes include self-interest and populism.

Resources

The role of resources in promoting digital transformation or institutionalisation was clearly evident from the literature. Resources such as funding and human capital were identified as critical resources in e-government integration, interoperability and information sharing initiatives (Scholl & Klischewski, 2007; Yang & Maxwell, 2011; Fan, Zhang & Yen, 2014) Sub-themes under resources identified in this study include funding and skills.

Information and communication infrastructure

Information and communication infrastructure also emerged from the literature. Information and communications infrastructure in this instance broadly refer to digital technologies, information technology, telecommunications infrastructure, software and security systems that promote integration, interoperability and access to information and other digital content. Sub-themes identified include telecommunications, information technology and information systems.

4.9.2 Themes emerging from the data

Two new themes emerged during the analysis of the data. These were recurring concepts that were previously not identified during closed coding.

Collaboration

Collaboration was identified as one of the key themes during the analysis of data (documents and interview). Collaboration was identified as a recurring theme on issues around policy design and policy implementation. Sub-themes identified under collaboration include inter-organisational relations, partnerships, networks and cohesion.

Innovation

Innovation capability is critical in the transformation of institutions as it impacts on the ability of organisations to respond to change. Sub-themes include process innovation, organisational innovation and service innovation. Institution, organisation, collaboration and information and communication infrastructure are related themes.

Table 17 summarises the themes identified in this study and gives examples from the data.

Table 17: Themes and sub-themes

Main theme	Main sub-themes	Examples
Leadership and governance		
Leadership	• **Political leadership** • ICT leadership • Management • Project management	"In South Africa, the top political leadership is prioritising certain issues other than ICT" (Respondent 2).
Governance	• **Transparency** • Accountability • Corruption	"Despite adopting the "Batho Pele" (People first) principles that speak to service standards, access to information and openness and transparency among other things, some or many government entities don't live by those values" (Respondent 11).
Institutions		
Institution	• **Goals & mandates** • Agency • Actor	"Departments are only concerned with meeting their performance targets and they hardly pay attention to how they impact the mandate of other departments" (Respondent 9).
Organisation	• Structures • Processes • Systems	"Some of the challenges we are facing regarding the interoperability of e-government systems is that GITOC is a dysfunctional structure (Respondent 12)
Innovation	• **Organisational innovation** • Process innovation • Service innovation	"Bureaucracy in government stifles innovation and transformation due to the tedious process of the implementation of change" (Respondent 6).
Collaboration	• Inter-organisational relations • Partnerships	"There is no information sharing culture, people share information with people they know in their networks" (Respondent 9).

	• **Networks** • Cohesion	
Trust	• **Institution-based trust** • Process-based trust • Leadership-based trust	"The e-toll project is a significant example of citizen's mistrust of government as they viewed the initiative it as another project to benefit the political elite" (Respondent 5)
Regulation	• Policies • **Legislation** • Procedures	"There is no legislation that enforces compliance by government hence things fall flat when it comes to implementation" (Respondent 2).
Norms	• **Standards** • Ethics • Principles • Guidelines	"One of the most significant challenges we face as a department is the poor adoption of norms and standards" (Respondent 6)
Culture	• **Values** • Belief systems • Practices	"The culture in government has made it difficult to live those values or principles" (Respondent 11).
Power and Politics		
Power	• **Causal** • Dispositional • Facilitative	"There are powerful ministries such as the Presidency and Treasury, whenever they say things shall move there is compliance". (Respondent 6)
Politics	• Self-interest • Populism	"The challenge is that political interests of those in power influence the prioritisation of policy in South Africa" (Respondent 5)
Resourcing		
Resources	• Funding • Skills	"Without funding, any programme or policy is bound to fail" (Respondent 2)
Information & Communication infrastructure	• Information Technology • Information systems • Telecommunications	"The majority of government departments are running on legacy systems which make integration and interoperability a challenge as the technology is old and incompatible with new standards for interoperability" (Respondent 12).

4.10 Rigour in interpretive research

Interpretive research has often been criticised for lacking rigour (Yin, 2009; Gupta & Mukhopadhyay 2014). The strategies highlighted below were adopted to increase rigour in this study.

- Use of multiple sources of evidence through triangulation in data collection (Yin, 2009; Suter, 2009). Triangulation in case study research makes use of multiple sources of evidence to support the conclusions of the study. Suter (2012:350) defines triangulation as "A method used in qualitative research that involves cross-checking multiple data sources and collection procedures to evaluate the extent to which all evidence converges." Triangulation in this study included the use of interviews, documentary evidence and a review of the literature. Baxter and Jack (2008) liken each data source to

one “piece of the puzzle”, with each piece playing a critical role in helping the researcher understand the issue being investigated. Triangulation increases trust in the validity of the study’s findings as the multiple sources of data enhance corroboration of evidence (Suter, 2012). This was also key in eliminating bias, one of the major weaknesses of case studies.

- Use of theory to underpin the qualitative interpretive case study research (Yin, 2009).Theory in this study was used to guide the research design, data collection process and analysis as recommended by Walsham (1995a). Institutional Theory and the Circuits of Power Framework were used in this study to guide the conceptualising of the research problem, the development of research questions and was also used as a framework for analysing the data.
- Peer debriefing (seminars, conferences, symposiums, research supervisor and other information systems academia (Shenton, 2004; Yin, 2009). To achieve this objective I attended and participated in conferences and seminars on e-government to present research conducted so as to solicit feedback from peers and experts in the information systems and e-government field.
- Key informants were identified and invited to participate in this study through semi-structured interviews so as to provide primary data for the study. To ensure validity, key informants were also used to confirm findings from other sources such as documents.
- The adoption of a well-established research method as recommended by Shenton (2004) is also critical to increasing rigour. The interpretive case study is increasingly being recognised as an appropriate research design in investigating complex phenomena like e-government. The appropriateness of a single case for this study is also discussed in earlier sections.

- A systematic review of the literature to assess the extent to which the findings relate to the existing body of knowledge in e-government is also a key criterion enhancing rigour in qualitative research (Shenton, 2004; Kothari, 2009). A systematic review was conducted as part of this study. The research paper was published as a peer-reviewed conference paper.
- Developing a case study protocol as recommended by Eisenhardt (1989) and Yin (2009) also ensured rigour in this study. A case study protocol is a formal document that captures procedures to be used in data collection. These include (i) the procedures for contacting participants and making fieldwork arrangements; (ii) a guide for protecting privacy, anonymity and confidentiality of human participants; (iii) research questions and objective to be addressed throughout data collection, including possible sources of data; and (iv) a preliminary outline for the final case study report (Yin, 2009). A protocol was written as part of the research proposal which was presented before a PhD proposal defence committee which was accepted without conditions.

4.10.1.1 Evaluating interpretive research

Table 18 highlights the principles for measuring the quality of interpretive research proposed by Myers and Klein (1999:72). These principles were applied to ensure that this study was rigorous.

Table 18: Principles of interpretive research, Myers& Klein (1999:72)
The Fundamental Principle of the Hermeneutic Circle This principle "suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form" (Myers & Klein, 1999:72).
The Principle of Contextualization Requires "critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged" (Myers & Klein, 1999:72).

The Principle of interaction between the researchers and the subjects This principle requires "critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and participants" (Myers & Klein, 1999:72).
The Principle of Abstraction and Generalization This principle "requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action" (Myers & Klein, 1999:72).
The Principle of Dialogical Reasoning This principle "requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings with subsequent cycles of revision (Myers & Klein, 1999:72).
The Principle of Multiple Interpretations This principle "requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study" (Myers & Klein, 1999:72).
Principle of Suspicion This principle requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants (Myers & Klein, 1999:72).

4.11 Ethical considerations

Ethical considerations are important as this study involves human participants. According to Yin (2009), it is important to conduct research with "high ethical standards" especially in case study research involving human subjects. In this study, I adhered to the University of Witwatersrand research ethical procedures and guidelines as determined by the Human Research Ethics Committee as well as those proposed by Yin (2009).

Before the study could be conducted, permission from the participants and their organisations was sought and it was explained to them the reason for their selection as well as what the purpose of the interview was (See Appendix B: Participants invitation letter). Participants were

also requested to sign an interview consent form voluntarily granting permission for participation in the study and to record the interviews as well as granting permission for the results to be used for academic and research purposes only without infringing their privacy and confidentiality.

Senior staff members who were not considered vulnerable participants and whose participation was unlikely to have a negative impact on their employment were interviewed in this study. I was however aware that the environment is politically sensitive and thus remained objective and politically neutral at the same time avoiding sensitive political questions that could make participants uneasy without adding value to the study. Participants also remained anonymous, protecting their privacy and confidentiality. Participants' personal information was not collected and used in this study. Information that emerged during interviews and had the potential to expose the identity of the participants was also removed. This study was also conducted in some national government departments that observe strict security protocols. At the advice of the departments concerned, I adhered to conditions set that "information that emerged during the study and had the potential to compromise national security was to be treated with great confidentiality as guided by the secrecy and security protocols of government". In one department I had to undergo through a security vetting and clearance process before permission could be granted to include the department in question in the study. It was also explained to participants that their involvement in this study was voluntary and that they were free to choose not to answer certain questions or withdraw from the study at any time without anything being held against them.

4.12 Summary

This chapter discussed the choice of the research paradigm, research design, data collection and data analysis. The methodological choices in this study were influenced by the problem as

defined by the purpose and the three research questions that shaped this study. The use of the interpretive paradigm, for example, was due to its appropriateness in understanding social phenomena and context in disciplines such as information systems and e-government. A case study research design was used because South Africa is a unique case of one of the few countries in Sub-Saharan Africa that have embraced the digital transformation agenda. Appropriate measures were also taken to ensure rigour. Some examples include the triangulation of evidence and the use of theory to frame the study. In the next chapter (Chapter 5) I discuss the state of e-government in South Africa.

CHAPTER 5

STATE OF E-GOVERNMENT IN SOUTH AFRICA

5.1 Introduction

Governments are increasingly under pressure to govern and operate efficiently so as to improve the quality of life of their citizens. E-government interoperability, integration and information sharing is one of the key strategies governments are adopting to improve collaboration and synergies across government agencies so as to increase efficiency in service delivery (Pardo, Nam & Burke, 2012). South Africa is considered as one of the few countries in Africa that have embraced e-government and ICT as a strategy for enhancing service delivery (United Nations, 2018). South Africa is ranked number two in e-government development in Africa (after Tunisia) and amongst the top 40% globally (United Nations, 2018). South Africa has put in place mechanisms to move to higher levels of e-government necessary for the government to become "smart", and for this, the integration and interoperability of e-government systems remain pivotal. This notion is reiterated by Gil-Garcia (2012) who argues that to transform to a smart government, governments are adopting ICT to interoperate and integrate systems, processes, information, physical infrastructure and institutions to strengthen governance and service delivery.

The South African government has identified integration, interoperability and information sharing as important in achieving its goal of a seamless information and communication infrastructure. This is crucial for achieving the government's vision of developing a "dynamic and connected information society and a vibrant knowledge economy that is more inclusive and prosperous" (South Africa, 2012:190). In 2005 the South African government approved the implementation of an Integrated Financial Management System to integrate financial

management, supply chain management, payroll, human resources management and business intelligent functions. Governments, however, continue to face barriers in interoperating and integrating their systems and sharing information as discussed in Chapter 2. South Africa is no exception and has faced challenges in its attempt to integrate system in the public sector. A significant example is the Integrated Financial Management System which is facing challenges such as delays in implementation and wasteful expenditure amounting to R1, 2 billion (ENCA News , 2017). The way governments respond to these barriers influences their successful digital transformation. Below, the purpose of this chapter is unpacked.

5.2 Purpose of the Chapter

The purpose of this chapter is to address the 2nd research objective which is to explore the institutional mechanisms implemented by the South African government to promote integration, interoperability and information sharing in support of a digital transformation and smart governance agenda. This is done by:

(i) Discussing policy and legislation as regulative mechanisms in realising the government's vision of a "connected, inclusive and smart society". Regulative mechanisms in institutions "regulate and constrain behaviour" through establishing rules, enforcing and monitoring compliance in order to influence the desired behaviour in institutions (Scott, 2014:59). Policies and legislation that address e-government integration, interoperability and information sharing barriers such as privacy, security, trust concerns, lack of infrastructure, skills, policy inadequacy, governance and strategy challenges are identified.

(ii) Analysing the strengths and gaps in the current policy and legislative framework in advancing the "smart" agenda through integration, interoperability and information sharing for improved service delivery, efficiency and governance.

(iii) Discussing the implementation of policy reforms and programmes aimed at strengthening e-government integration, interoperability and information sharing necessary for the digital transformation of the South African government and smart governance.

The focus is on policy actions, decision making, leadership, coordination of the implementation of programmes, allocation of resources and similar activities in government. The influence of the political, socio-technical, socio-historic and socio-cultural factors in the development and implementation of policy and how these have impacted the success thereof are also discussed. In analysing policy and legislation implementation, Institutional Theory and the Circuits of Power Framework are used as a lens for understanding institutional behaviours, relationships and barriers affecting integration, interoperability and information sharing in government.

5.3 ICT and e-government policy framework in South Africa

E-government and related ICT policies and regulations have continued to develop in Africa with increased pressure from the convergence of technologies and awareness of the importance of ICT as a tool for social and economic growth (African Development Bank, 2013). The government of South Africa has recognised that ICTs have the potential to further the rights enshrined in the South African constitution by changing the way citizens' access information, communicate and participate in social and economic activities. This is evident in its various programmes and policy decisions aimed at promoting the digital transformation of government discussed in the coming sections. In this section, the development of e-government policies and regulations in South Africa is discussed. The focus is on ICT and e-government policies, government strategic frameworks and legislation published between 1998 and 2018. This period coincides with the rapid development of e-government and ICT in South Africa after

the Presidential Commission Report on the Transformation of the Public Service identified ICT as key in transforming the public sector.

Table 19 is a summary of policies and strategies that have informed digital transformation, e-government and ICT development in South Africa since 1998. Each of the policies and strategies is briefly described in the table.

Table 19: E-government and ICT policy Framework in South Africa

Policy / Strategy	**Key features**
Electronic government: The Digital Future: A Public Service IT Policy Framework (2001)	Provides a framework for e-government development in South Africa
Digital Migration Policy and Strategy (2008)	Promotes the adoption of digital and other technologies in building an inclusive digital society.
National Development Plan (2012)	South Africa's medium and long-term term strategic plan for promoting inclusive growth and ending poverty.
Corporate Governance of ICT Framework 2012	Promotes the governance of ICT and information as strategic resources in the public sector.
National Infrastructure Plan (2012)	Promotes the development of key national infrastructure for promotive socio-economic development.
National Broadband Policy (2013)	Supports the provision of broadband services to promote digital transformation in government and society.
National Cyber-security Policy Framework 2015	Promotes a cybersecurity culture and the protection of national information and communication infrastructure from cyber-attacks.
Integrated ICT Policy (2017)	The purpose of the policy is to unlock the potential of ICTs to eliminate poverty and reduce inequality in the country by 2030. It also sets out the South African government's choices in relation to the principles, rules and guidelines put in place to achieve the long-term goals and objectives set out in the National Development Plan.
National E-Strategy 2017	The strategy "aims to position South Africa as a significant player in the development of ICTs throughout the value chain of the sector as well as accelerate the uptake and usage of ICTs in other social and economic sectors" (South Africa, 2017:7)

5.3.1 Electronic government: The digital future: a public service IT policy framework (2001)

In 2001, South Africa adopted its first ever e-government policy and strategy. The e-government policy framework termed *"Electronic government: the digital future: a public service IT policy framework"*, has been used to guide the development of e-government since its adoption in 2001. The framework identifies four key pillars underpinning e-government development in South Africa. The four pillars include e-government interoperability which is the main focus of this study. In the coming section, I discuss the extent to which the priorities reflected in the four key pillars have been met. The four pillars are described below.

- **Interoperability** – The need for government ICT systems (data, application, infrastructure, communication systems and platforms, applications) to communicate, exchange of data, and to promote the centralisation and integration of IT systems etc.
- **IT Security** – Calls for the recognition of the importance of protecting the physical IT systems and data from unauthorised access, malicious code and sabotage. In an increasingly connected world where incidents of cybercrime and cyberterrorism are increasing, security has become a priority for governments worldwide.
- **Economies-Of-Scale** – were identified because of the purchasing power of government. The policy framework sought to promote compliance, build its skills and research capacity, minimise exploitation by vendors and influence the development of the local ICT industry.
- Finally, the framework called for departments to **Eliminate duplication.** It expresses the view that "to increase efficiency, departments need to 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". (South Africa, 2001:8).

The government ICT House of Values first proposed in the framework as illustrated in the left diagram in Figure 10 has since been revised by SITA to add Government-Wide Enterprise Architecture as the foundation of the four pillars as illustrated in the right diagram in Figure 10. Digital inclusion has since been added as a fifth pillar. **Digital inclusion** in South Africa is about promoting digital entrepreneurship and transforming the ICT sector in terms of ownership, management and control (South Africa, 2016).

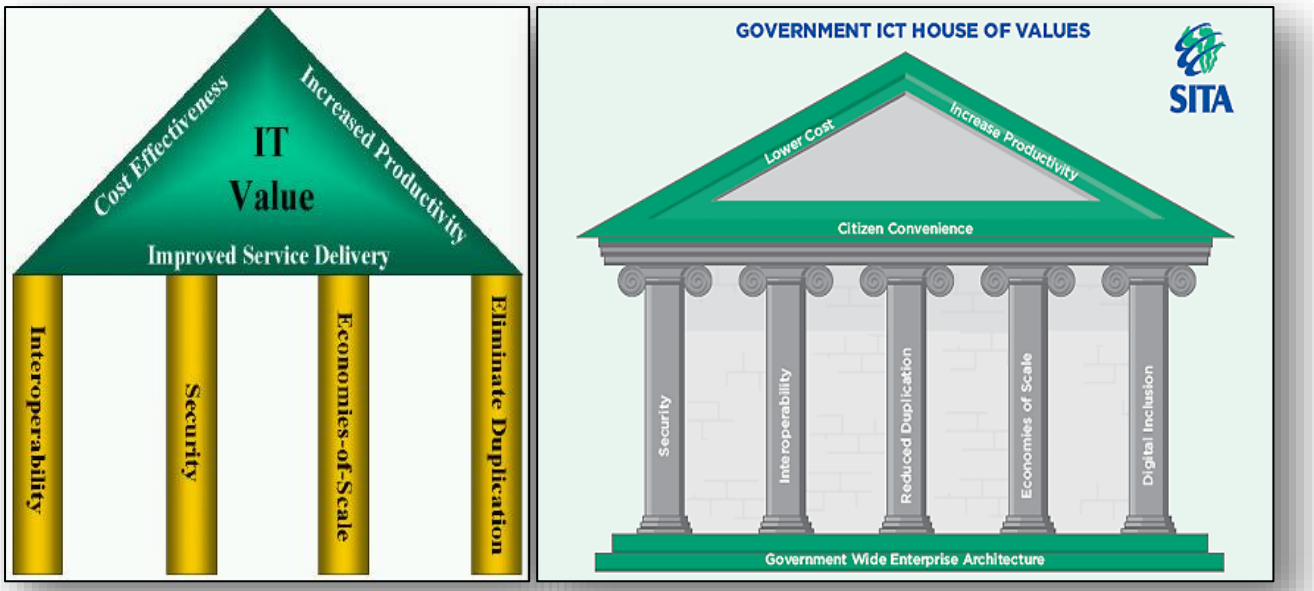

Figure 10: Government IT house of Values

The pillars in the government ICT house of pillars are interrelated. Interoperability, for example, enables the elimination of duplication and economies of scale. Security is also critical in interoperability. Information sharing and integration in planning and implementation of policies and programmes are also important in eliminating duplication and achieving 'economies of scale'.

What is concerning, is that the South African e-government strategy has not been updated since 2001. Although it remains largely relevant, it fails to reflect the fast-paced changes that have occurred in ICT and e-government in the past 15 years. Despite identifying interoperability as a key pillar, the state of interoperability is still poor (Department of Telecommunications & Postal Services, 2015b). Attempts have been made in the past 15 years to strengthen interoperability and integration through the implementation of standards and frameworks but these largely remain ineffective. ICT skills and research capacity remain low and this has impacted the growth of the ICT industry (Schofield, 2018).

5.3.2 Digital Migration Policy 2008

Between 2001 and 2008, there were no significant policy developments around e-government in South Africa. The 2008 Digital Migration Policy was formulated in response to external coercive influence from international bodies. The adoption of the digital migration policy was as a result of the International Telecommunications Union (ITU) 2006 resolution which gave member countries a June 2015 deadline to migrate to digital broadcasting (International Telecommunications Union, 2011). Here we observe coercive isomorphic pressure influencing policy decisions in South Africa. The adoption of the digital migration policy was an opportunity to advance the inclusive digital society agenda. Digital migration is critical in promoting digital access and connectivity. This is important in achieving the government's goal of a digitally transformed government and society.

South Africa missed the ITU deadline for digital migration due to delays in the implementation of its policy. Unclear responsibilities since the split of the former Department of Communications into two departments in 2014 (the Department of Communications and the Department of Telecommunications and Postal Service) resulted in departmental turf wars which contributed to inefficiencies (Department of Telecommunications and Postal Services,

2015b). The challenges in the digital migration policy were further witnessed in July 2016 when the Minister of Telecommunications and Postal Services instituted a legal process to halt the Independent Communications Authority of South Africa (ICASA) from auctioning off parts of the spectrum. The ministry argued that auction of the spectrum was premature as South Africa's digital migration process was not yet complete. In a media statement released by the Department of Telecommunications and Postal services, the ministry argued that "the position of Government is that it is the custodian of the spectrum which is a national and public resource and whose utilisation must benefit all the people of South Africa. There is presently no policy direction on the spectrum that has been issued. The policy process is ongoing but as yet still incomplete" (Department of Telecommunications & Postal Services, 2016).

The legal battles between the Department of Telecommunications and Postal Services and ICASA, a government agency reporting to the Department of Communications, is clear evidence of "turf wars" and power and politics at play in policy making and implementation. This arguably leads to weakened political cohesiveness, which ultimately compromises policy and programme implementation. The role of power dynamics in institutions and how they impact implementation of policy is probed further through interviews and results are discussed in Chapter 7.

5.3.3 The National Development Plan (NDP) 2012

The NDP is South Africa's medium to long-term strategic plan for guiding South Africa's socio-economic development agenda, including the digital transformation agenda. The NDP is South Africa's social and economic development blueprint and recognises the important role ICT will play in South Africa's development. The vision of the NDP is that "by 2030, ICT will underpin the development of a dynamic and connected information society and a vibrant knowledge economy that is more inclusive and prosperous..." (South Africa, 2012:190). The

NDP, adopted by the South African government in 2012, laid a strong foundation for recognising ICT as an important tool for social and economic development.

The NDP identifies integration in government programmes, processes and systems as pivotal for increasing efficiency in the pursuit of social and economic development in South Africa. The NDP states that:

> "By 2030 the ecosystem of digital networks, services, applications, content and devices, firmly integrated in the economic and social fabric, will connect public administration and the active citizen; promote economic growth, development and competitiveness...and strengthen social cohesion; and support local, national and regional integration." (South Africa, 2012:290).

Integration will play an important role in increasing efficiency considering the overlaps in government programmes and initiatives. For example, skills development, one of the South African government's priorities for inclusive growth, demands that various government departments work together in developing a "credible institutional mechanism for skills planning". Integration, interoperability and information sharing in government will impact collaboration, planning, decision making and implementation of such government programmes. Without an integrated approach, efforts are often fragmented and duplicated, with unclear lines of responsibility and wastage of resources. The prioritisation of an integrated approach to the development and implementation of government programmes has laid a strong foundation for the integration of e-government systems. It remains to be seen if integration has indeed been strengthened by the policy and regulative mechanisms.

5.3.4 Corporate Governance of ICT Framework 2012

South Africa's first democratic government in 1994 inherited a racially divided, fragmented and unaccountable governance system (The Presidency, 2014). The King IV Report on governance in South Africa also reiterates the importance of good governance in both the private and public sectors, including ICT and information governance. It mandates organisations to establish formal structures and processes for improving the management and governance of information. The incorporation of ICT into the overall governance framework is important in the effective governance of organisations as ICT has become an important tool in modern organisations.

In 2012, the Department of Public Services and Administration implemented the Corporate Governance of ICT Framework to promote the good governance of information and ICT in the public sector (Department of Public Service & Administration, 2012). ICT governance is important in managing risks, promoting quality, promoting monitoring and evaluation, promoting accountability and ensuring high ethical standards, especially in an integrated environment (Department of Public Service & Administration, 2012). Such mechanisms arguably assist in the institutionalisation of desired and acceptable institutional behaviour, practices, norms and standards.

To promote ICT governance in the public sector, the framework has assigned the responsibility of decision making to senior political and managerial leadership and stipulates that decision making should not be delegated to ICT specialists. According to the framework, the importance of the governance of information and ICT resources should thus be given the same recognition as the governance of other resources in the public service. This is supported by other e-government studies that argue that e-government initiatives need to be driven at top leadership

in the public sector (Schuppan, 2008; Dawes, Cresswell & Pardo, 2009). The recognition of information and ICT as equally important resources in government and top leadership support in ICT governance is meant to improve the prioritisation of information and ICT as strategic resources in government. Top leadership commitment is important in success of e-government. Leadership is responsible for developing and implementing relevant policies, strategies and institutional mechanisms. Promoting good governance within the public sector is likely to increase institution-based trust.

5.3.5 National Infrastructure Plan 2012

The National Infrastructure Plan was adopted in 2012 to transform the economic landscape and service delivery through infrastructure development. To implement the plan, the South African government developed 18 Strategic Integrated Projects (SIPS) to cover infrastructure development in various economic sectors including ICT. Knowledge SIP 15: Expanding Access to Information and Communication Technology, aims to increase digital access and connectivity. Its goal is to achieve 100% broadband connectivity and coverage by 2020. Poor connectivity and infrastructure capability has slowed South Africa's digital transformation, including e-government. Some of the issues surrounding connectivity are unpacked below under the National Broadband Policy and Strategy. Monitoring of implementation remains a challenge. The National Treasury has reported that over the medium term, an amount of R32.6 million has been budgeted for facilitation, monitoring and reporting on ongoing infrastructure projects (National Treasury, 2018).

5.3.6 National Broadband Policy and Strategy 2013

Broadband is at the heart of achieving government's vision of a digitally transformed government and society. In 2013, the Department of Telecommunications and Postal Services (formerly the Department of Communication) developed the National Broadband Policy and

Strategy (SA Connect) to increase the digital connectivity of government, business and citizens. SA Connect is government's initiative for realising the NDP's vision of "a seamless information infrastructure by 2030 that will underpin a dynamic and connected vibrant information society and a knowledge economy that is more inclusive, equitable and prosperous" (South Africa, 2012:190). Broadband is set to play an important role in connecting and integrating people, government and business in the pursuit of economic growth and social cohesion (South Africa, 2012; South Africa, 2013a).

The current poor state of broadband penetration in South Africa is a threat to the South African government's vision of an integrated and connected "smart society". An estimated 9.5% of households, for example, have access to Internet services at home (Statistics South Africa, 2016). The National Broadband Policy and Strategy addresses both supply-side issues such as regulation, infrastructure and competition, and demand-side issues such as affordability and digital literacy. Various government programmes have been launched to address the supply side and demand side challenges. The National Infrastructure Plan through SIP 15: Expanding Access to Information and Communication Technology is expected to address infrastructure challenges. Demand-side issues such as digital literacy are being addressed by the establishment of institutions such as the Ikamva National e-Skills Institute (iNeSI) to coordinate the development of an e-skilled and e-empowered society. The effectiveness of such programmes remains questionable as there are no proper monitoring and evaluation mechanisms in place to assess their impact (South Africa, 2016).

5.3.7 Cyber Security Policy Framework 2015

The next framework to emerge, in 2015, was the Cyber-Security Policy Framework. Concerns over security in the digital and connected environment are a threat to the success of e-government integration, interoperability and information sharing. Responding to this concern,

in 2015 the Parliament of South Africa approved the National Cyber Security Framework to address security concerns in the cyber environment. It seeks to promote a cybersecurity culture, compliance with minimum security standards, protect national information infrastructure and establish a legal framework among other things (State Security Agency, 2015).

South Africa is one of the few African countries that have developed a Cyber-Security Policy framework (ITU, 2015). Despite the presence of a cybersecurity framework, challenges in cybersecurity still remain due to the inadequacy of the legislative framework. According to the State Security Agency (2015:14), "currently there are various pieces of legislation, some with overlapping mandates administered by different Government Departments and whose implementation is not coordinated. Furthermore, the legislation when viewed collectively does not adequately address South Africa's cybersecurity challenges". The legislation referred to include the Electronic Transactions and Communications Act (2002), the Regulation of Interception of Communications Act (2002) and the National Strategic Intelligence Act (2002) etc. In response, in 2015 the Cybercrimes and Cybersecurity bill was promulgated to address some of the challenges (see section 5.8). Regulative mechanisms such as policies and legislation play a complementary role in the implementation of programmes aimed at transforming government.

5.3.8 Integrated ICT Policy 2016

ICT policy development in South Africa has been fragmented with separate policies for postal services, telecommunications and broadcasting and e-commerce being common until recently (see Table 20). These policies failed to provide an integrated and holistic approach to ICT use.

Table 20: ICT policy development in South Africa before 2000 (Department of Telecommunication & Postal Services, 2015c)	
Policy	**Focus**
White Paper on Telecommunications Policy (1996)	To promote the provision of telecommunication services to all South Africans.
White Paper on Postal Policy (1998)	To establish a broadcasting system based on the principles of universal access, national unity, inclusiveness and diversity.
Green Paper on e-commerce (2000)	To promote the adoption and use of ICTs in business, government and society.

To take advantage of the convergence of communication technologies and to address the challenges caused by the fragmentation of the ICT policy framework, the South African government initiated the development of an Integrated ICT Policy in 2013 after it published the ICT Policy framing paper. The goal of the policy framing paper was to solicit public input on the goals and objectives of the proposed Integrated ICT Policy. In January 2014, the Green Paper was published for public comment and its aim was to "reflect on the implementation successes and challenges and to gather opinions on the required policy interventions to address some of these challenges" (Department of Telecommunications & Postal Services, 2015c:1) The Integrated ICT Policy Discussion Paper published in 2015 outlined the possible policy options and proposed approaches and solicited public comments on how to approach the implementation (Department of Telecommunications & Postal Services, 2015c). This White Paper "outlines the overarching policy framework for the transformation of South Africa into an inclusive and innovative digital and knowledge society. It reinforces and extends existing strategies such as South Africa Connect, the national broadband policy, the National Cybersecurity Policy Framework and National Development Plan" (Department of Telecommunications & Postal Services, 2015c:1).

Delays in the policymaking process were evident in the promulgation of the Integrated ICT Policy. It took four years for the Integrated ICT Policy to be published. This is however due to the extensive consultation process. The implementation of the Integrated ICT Policy at the time

of writing this thesis hadn't been finalised. On the 17th of November 2017, the Minister of Telecommunications and Postal Services published an invitation for public comments on the Electronic Communications Amendment Bill. The Bill seeks to implement and make into law the provisions of the National Integrated ICT Policy White Paper. Regulative mechanisms such as policies play a key role in the implementation of programmes aimed at transforming government. Delays in implementation of such regulative mechanisms, however, remain a significant challenge as shall be discussed in Chapter 7.

The Integrated ICT Policy has identified digital transformation of government as one of the key pillars for transforming South Africa into an inclusive digital society**.** ICTs are set to transform the socio-economic landscape, citizens' interaction with government and government service delivery (South Africa, 2016). The integration and interoperability of systems play a significant role in the digital transformation by facilitating collaboration, interaction and synergies in government for efficient service delivery. These are critical features of promoting smart governance.

5.3.9 National E-strategy 2017

The National E-strategy seeks to transform South Africa into a "full digital society marked by a widespread diffusion, uptake and usage of ICTs in the whole society" (South Africa, 2017:2). Digital transformation has been identified as key in facilitating inclusive economic growth and economic and social inclusion. An inclusive digital society will be underpinned by the effective coordination of the following key drivers.

- **Enabling policies** that are innovative and promote the digital transformation agenda.
- **Infrastructure** development to address supply-side issues such as attracting infrastructure investment and competition

- **Universal access** to address demand-side issues such as affordability and high-quality services irrespective of geography and social status.
- **Security** to promote citizen's trust in the digital environment through the protection of their privacy and personal information.
- **Content -** Promoting the development of local content so as to stimulate the growth of the local ICT sector.
- **Innovation -** Promoting the development of local intellectual property, innovation and stimulating local production and manufacturing.
- **Skills –** Initiating skills development programmes to create awareness, uptake of ICTs in society and building capability for the 4th industrial revolution.

5.4 Legislation as a regulative mechanism in promoting e-government transformation

In addition to policy frameworks, legislation has been used to promote integration, interoperability and information sharing by addressing barriers such as personal information privacy, security, trust, infrastructure and governance. Significant examples of legislation developed since 1998 are highlighted below.

5.4.1 Key legislation

The State Information Technology Agency (SITA) Act, 1998 established the State Information Technology Agency (SITA) whose mandate is to coordinate the State's ICT resources to promote service delivery, achieve economies of scale and promote interoperability. SITA is also responsible for assisting in the development of security and interoperability standards for strengthening interoperability.

The Promotion of Access to Information (PAIA) Act, 2000 promotes access to information held by public bodies. The Act promotes accountability, transparency and good governance. It addresses some of the barriers to information sharing and integration such as misuse, non-transparency and information hoarding. One of its goals is to promote trust in public bodies through openness and transparency (South Africa, 2000).

The Electronic Communication and Transactions (ECT) Act, 2002 regulates the collection, use, storage, disposal, security and the protection of personal information in electronic transactions. The ECT Act also mandated top political leadership to prioritise the development of a National E-strategy to promote the inclusive digital transformation agenda in South Africa (South Africa, 2002a).

The Regulation of Interception of Communications and Provision of Communication-Related Information (RICA) Act, 2002 provides a legal framework for the monitoring and interception of communications (South Africa, 2002b). The Act has often been opposed for infringing section 14 of the South African constitution that promotes the right to privacy. The Act is also seen as critical in promoting national security and is based on the argument that the right to privacy, like any other right, is not absolute. The Act is also an example of "government's attempt to balance the people's rights to privacy and national security.

The Protection of Personal Information (POPI) Act, 2013 regulates the collection, use, storage and disposal of personal information**.** It also promotes privacy, security and trust and transparency in the collection, use and processing of personal. The Act also addresses trust concerns in information sharing, section 16, for example, addresses the quality of information

while section 19 addresses security measures for promoting data integrity and confidentiality (South Africa, 2013b).

The Public Administration and Management Act, 2014, promotes the use of ICT in the public administration. The Act has also assigned heads of public institutions the responsibility to ensure the interoperability of information systems.

Cybercrimes and Cybersecurity bill, 2015. The aim of this legislation is to "criminalise and impose penalties on cybercrime; to further regulate the jurisdiction of the courts; to protect critical national information infrastructure; and to further regulate aspects of international cooperation in respect of the investigation of cybercrime" (South Africa, 2015:2). This legislation is in response to the need to establish a national cybersecurity regulative framework.

5.4.2 An analysis of the legal framework

The legislation addresses some of the concerns around integration, interoperability and information sharing such as security, privacy, trust and quality. Putting measures in place to promote quality, security and accuracy of data are important steps in promoting integration, interoperability and cross-boundary information sharing (Yang & Wu, 2015).

Legislation has elevated digital transformation including integration, interoperability and governance to the level of senior political leadership in government. This signifies the importance of digital transformation in the South African government agenda. This is also consistent with recommendations from policies such as the Corporate Governance of ICT Framework (2012) that elevated the responsibility of ICT in government to senior leadership. Legal backing is critical in the implementation of policy directives. The emphasis of the role of top political leadership in implementation highlights the role of regulative mechanisms in

giving legitimacy to transformation initiatives. This is important in the institutionalisation of legislative reforms aimed at promoting digital transformation in government. Challenges, however, remain in the implementation of policy as highlighted next.

Delays in implementation point to weaknesses in the institutionalisation of reforms aimed at promoting digital transformation. The Cyber-crime bill is yet to be finalised for implementation as law. The delays are concerning given the rise of incidents of cybercrime globally and South Africa's reputation as a cybercrime hot-spot. This leaves South Africa vulnerable to attack with a limited legal basis to defend itself or prosecute those responsible. Cyber-crime is estimated to cost South Africa around R5.8 billion annually (ENCA News, 2015).

The legitimate authority of some actors like SITA mandated by legislation to implement interoperability remains questionable. SITA's authority and the extent to which it can influence compliance remains unclear due to non-compliance with some of the standards and norms for promoting interoperability as mandated by legislation. According to the Auditor General (2017), compliance with some of the ICT governance controls remains low.

The institutionalisation of reforms is however not always a smooth process especially when it is perceived to be infringing the rights of other actors. Resistance is a common feature in such instances. This requires governments to come up with appropriate measures to promote compliance and other desired social behaviour. Participation and engagement are among some of the measures often used to get buy-in during the development and institutionalisation of new policy reforms. This however often results in delays in the legislation making and implementation process.

5.5 E-government and ICT policy and legislation implementation in South Africa

In this section, I discuss the implementation of policy and legislation as regulative mechanisms that support the digital transformation of government in South Africa through improving the integration and interoperability of systems among other things. I focus on how the policy and legislative framework promotes e-government integration, interoperability and information sharing, and discuss some of the challenges in implementing some of these frameworks.

5.5.1 Resourcing

The allocation of resources is important in ensuring that institutions can carry out their mandates proclaimed in regulative mechanisms such as policies and legislation. There is, however, evidence of inconsistency between policy priorities and the actual implementation. In South Africa, despite the recognition of digital transformation as a national priority in promoting inclusive growth, the reality is somewhat not reflective of this. The SA Connect project for example, in the Medium Term Expenditure Framework (MTEF) for 2015/2018, was allocated R739 million by National Treasury despite requesting R1.4 billion for broadband rollout. The lack of adequate resources will jeopardise South Africa's goal of achieving 100 % broadband connectivity by 2020, a key strategy for the effective integration of e-government systems and digital transformation of government. This has also been worsened by allegations of misuse of funds by agencies such as the Universal Service and Access Agency of SA (USAASA), an agency of the DTPS tasked with the rollout of adequate Information and Communication Technology (ICT) infrastructure such as broadband. Resources are important in supporting institutional activities and mechanisms for promoting the institutionalisation of policy reforms. Without adequate resources, the institutionalisation of reforms is bound to fail. In Chapter 7, my discussion will also focus on the resourcing of institutions and how it impacts digital transformation initiatives. The role of actors such as top political leadership in influencing the resourcing of initiatives in institutions is also discussed.

5.5.2 Institutional leadership and leadership of institutions

Institutions such as the State Information Technology Agency (SITA) play an important leadership role in coordinating e-government services in South Africa, including the integration and interoperability of government systems. Leadership plays an important role in directing resources and activities in institutions. In government, institutional leadership plays an important role not only in establishing coercive mechanisms such as regulations but in establishing norms that that shape desired behaviour in institutions, including actions, resourcing and implementation of decisions.

The State Information Technology Agency (SITA), established through the SITA Act of 1998, has been tasked with "the mandate of provision of information technology, information systems and related services in a maintained information systems security environment too, or on behalf of, participating departments and organs of state and in regard to these services, act as an agent of the South African Government" (South Africa, 1998). The role of SITA thus includes the integration and interoperability of e-government systems. The establishment of SITA as an ICT and e-government implementation agency is a significant example of the use of legislation as a coercive mechanism to formalise e-government development through formal structures. SITA has also set the rules, norms and standards (normative mechanisms) for ICT and e-government development in South Africa.

What is concerning, however, is the capacity of SITA to lead digital transformation in government. SITA has been marred by leadership instability, allegations of corruption and numerous turnaround strategies most which have failed to take-off due to changes in leadership. In 2012 for example, a Proclamation issued by the President of South Africa led to the Special Investigations Unit (SIU) conducting an investigation following allegations of

unauthorised, corruption, maladministration and fruitless and wasteful expenditure by SITA. These internal challenges have compromised the effectiveness of SITA's institutional leadership in the digital transformation of government. Institutional success is not only driven by regulative and normative mechanisms, but also by cultural–cognitive mechanisms where moral governance is the basis for legitimacy. Cultural-cognitive mechanisms play a complementary role in ensuring the effectiveness of normative and coercive mechanisms.

The Department of Public Services and Administration (DPSA) has played a leading role in the digital transformation of government. Information technology management is one of the six programmes of the department. Its goal is to "promote and manage the use of ICT as a strategic tool in the design and delivery of citizen-centred services within government, by coordinating and consolidating public service ICT policies, strategies, costs, risk assessments, as well as ICT Governance matters" (Department of Public Services & Administration, 2017). The DPSA was instrumental in crafting policies and legislation that have driven digital transformation in government. Significant examples include the SITA Act, 1998, 2001 E-government Policy Framework and the 2012 Corporate Governance of ICT Framework.

The DPSA hosts the office of the Government Chief Information Officer (GCIO). The role of the GCIO is to "promote and manage the use of ICT as a strategic tool in the design and delivery of citizen-centred services within government, by coordinating and consolidating Public Service ICT policies, strategies, costs, risk assessments, as well as ICT Governance matters" (Department of Public Services and Administration, 2015a:1).

The Department of Telecommunications and Postal Services (DTPS) was established to "modernise the economy and economic infrastructure to bring the cost down through the roll-

out of Broadband, e-Government, Cybersecurity, Postal, and Postbank services" (Department of Telecommunication & Postal Services, 2015c:1). The Department of Telecommunications and Postal Services is thus set to play a major role in the digital transformation of society and government. Its mandate, as reflected in its website, is "to create a vibrant ICT sector that ensures that all South Africans have access to robust, reliable, affordable and secure ICT services in order to advance socio-economic development goals and support the Africa agenda and contribute to building a better world" (Department of Telecommunications & Postal Services, 2017). The Department of Telecommunications and Postal Service, formed in 2014 after the split of the then Department of Communications into two departments, has developed policies, legislation and programmes aimed at stimulating digital transformation. Significant examples include the Integrated ICT Policy and the implementation of the National Broadband Strategy and Policy (SA Connect) and the National E-strategy. In the 2015-2020 strategic plan, the department identified the following as its main objectives:

- To promote affordable broadband connectivity for promoting economic development.
- Promote the development of an ICT policy framework that promotes the socio-economic development of South Africa
- To promote the vision of an inclusive Information society and knowledge economy (Department of Telecommunications & Postal Services, 2015c)

Despite some of the noble initiatives, the DTPS, the department responsible for the digital transformation agenda in South Africa, has also had challenges. In 2015, an independent inquiry to investigate the management and governance of the Department was initiated by the Minister (Department of Telecommunications & Postal Services, 2015a). This happened after the Minister had received complains relating to abuses of power, conflicts of interests and infighting within the Department which had resulted in the department becoming dysfunctional

(Department of Telecommunications & Postal Services, 2015a). The Public Service Commission report into the inquiry was released in December 2015 but had not yet been made public at the time of finalising this thesis in October 2018.

The National Broadband Council established to provide leadership in promoting broadband development, is dysfunctional, several experts have resigned citing lack of guidance from the South African government (Times Live, 2015). This has led to unnecessary delays and challenges in meeting the targets set by the government.

These and other leadership challenges and lack of accountability of public officials will likely compromise the success of government's vision of an inclusive digital society driven by the digital transformation in the public sector as one of its key pillars. Such failures contribute to citizens' mistrust of public institutions driving transformation. Trust issues and gaining public confidence is one of the constraints that have compromised the South African government's digital transformation agenda (Department of Telecommunications & Postal Services, 2015c). Trust is key to increasing citizen participation in e-government initiatives (Scherer & Wimmer, 2014). Loss of trust in institutions leading reforms is a barrier to successful transformation. This also highlights the importance of deinstitutionalising norms, including leadership norms that might compromise the institutionalisation of reforms. Long established cultural-cognitive elements such as value systems also have a role to play in the institutionalisation of reforms. Implementation of reforms aimed at transforming institutions, for example, require a culture that promotes service excellence, agility and innovation. Without the leadership of the institution, institutions often fail to lead, effectively direct, coordinate and manage resources and activities meant to assist in the institutionalisation of reforms.

5.5.3 Norms and standards as mechanisms for achieving integration, interoperability and information sharing

Standards are important normative mechanisms meant to assist in institutionalising accepted behaviour, practices and desired performance. SITA has developed norms and standards aimed at strengthening the integration, interoperability and information sharing among government department and agencies in South Africa. The adoption of common standards strengthens security and promotes integration and interoperability (Dos Santos & Reinhard, 2012).

South Africa adopted the Minimum Interoperability Standards (MIOS) in 2008. The MIOS prescribed standards to promote interoperability between systems utilised in government and by citizens, to support e-government objectives. But because the standards have not been enforced, there is little compliance (Department of Telecommunications & Postal services, 2015b). This example illustrates that normative mechanisms can be ineffective in the absence of coercive mechanisms to support them. Beyond coercion, understanding the cultural-cognitive elements that support behavioural norms may assist in understanding how norms persist or change in institutions. This is instrumental in transforming institutions or deinstitutionalising certain beliefs, practice and norms that are a constraint in the digital transformation of government. SITA apparently does not have the power or legitimate authority to enforce compliance which has compromised its effectiveness in the digital transformation in government.

Security is one of the biggest barriers in e-government integration, interoperability and information sharing as discussed in Chapter 2. The South African government in 1996 developed the Minimum Information Security Standards (MISS) to address security, privacy, integrity and confidentiality of information transmitted and stored electronically. These

standards are an example of the balancing of the democratic right to access to information and restriction of access to confidential information. The standards are now outdated as they were published more than 20 years ago.

The 2010 National Security Regulations also known as the Protection of State Information Bill, or 'secrecy bill' in some circles were never implemented (Department of Telecommunications & Postal Services, 2015b). The "secrecy bill" received widespread criticism from civil society, human rights groups and media institutions. The bill was viewed as an unconstitutional, a threat to democracy and a violation of the right to access information. According to the Nelson Mandela Foundation (2013:1), the bill was an attempt to set up "an access to state information regime parallel to that envisaged in the Constitution and given force by the Promotion of Access to Information Act (PAIA)". Governments often find themselves having to juggle between promoting the right to right of access to information and that of national security.

The State Information Bill, despite being approved by parliament in 2013 and sent to the President for approval, the President objected and sent it back to Parliament for reconsideration. This is likely due to its widespread criticism which was a threat to the President's legitimate authority as a defender of the constitution. The role of coercive isomorphic pressure steaming from citizens, civil rights groups etc. can be witnessed in action. Pressure from citizens and civil rights groups influences decision making in democratic institutions, especially when the institutional actions are likely going to threaten its legitimacy. The success of regulative mechanisms is also likely where there is cohesiveness among the parties concerned. Mistrust of government policy intentions also breeds resistance. The resistance of regulative mechanisms often leads to failure in implementation. Standards, legislation and policies are

therefore not adequate in promoting e-government integration and interoperability if they are not updated and contextually relevant.

In 2007, an assessment of the state of security in public institutions found that information security was weak as a result of poor infrastructure, human error and non-adherence to prescriptions (National Intelligence Agency, 2007). The Auditor General (2017) also revealed significant weaknesses in security controls in its report. The effective implementation of security standards is influenced by human behaviour in institutions. According to Bjock (2004:1), "the extent of security in any information system - including that in its computer-based elements – is ultimately determined by human actions". When implementing e-government security measures, government institutions, therefore, need to treat security not purely as a technical challenge but a human one as well. This is important in this era dubbed the "4th industrial revolution", where the physical world and virtual world are increasingly connected due to advances in technology. This reinforces the usefulness of socio-technical theories such as Institutional Theory in understanding the interplay between social, human, organisational and technological factors in the design, adoption and implementation of ICT in government. By understanding the isomorphic pressures (coercive, normative and mimetic) acting on institutions, institutions can better prepare for changes brought by technology or other innovations.

5.5.4 Data privacy in an integrated and interoperable e-government environment

Data protection and protection of citizens' privacy remains one of the priorities for governments in a digital and connected environment. Promoting privacy by institutions is critical in fostering institution-based trust. Regulating how personal information should be shared promotes responsible data usage, accountability and transparency. Promoting behaviour change in how institutions handle personal privacy and data through legislation is one coercive

mechanism for enforcing compliance. Compliance in this instance is sanctioned through the enactment of legislation to influence how institutions, including the people in them, handle personal information. Moreover, coercive mechanisms such as policy and legislation are likely going to aid integration and interoperability by coercing government agencies to adopt the prescribed interoperability and information security standards to protect themselves against the consequences of non-compliance.

The POPI ACT, 2013 discussed earlier makes provisions for the appointment of an Information Regulator whose duties and powers include:

- Undertaking education programmes to promote the protection of information etc.
- Monitoring and enforcing compliance.
- Handling complaints relating to personal information and privacy breaches.
- Consulting with interested parties on issues related to the protection of personal information and privacy.

In October 2016, the President of South Africa appointed members of the Information Regulator. The appointment of an Information Regulator with powers to monitor and enforce compliance is evidence of the government's commitment to promoting privacy, a right that is guaranteed by the South African constitution. Granting the Information Regulator authority to monitor and enforce compliance is likely to improve compliance due to fear of consequences for non-compliance. One may argue that such coercive mechanisms might constrain information sharing due to fear that other institutions may be non-compliant and hence compromise institution sharing information. In Chapter 7, I probe this claim, with the aim of ascertaining public official's views on the role of such coercive regulative mechanisms in promoting the desired behaviour regarding the promotion of information privacy.

It is also important to note that the purpose of the POPI Act is not only to punish non-compliance, but also to promote the responsible sharing of personal information by educating the public, private and public institutions. The role of the Information Regulator is thus to also sensitise institutions and the public on the benefits of the Act. Citizens and institutions are likely to share information when there are guarantees that their information will be protected. Moreover, resourcing of institutions such as the Information Regulator is important to ensure they function efficiently and effectively.

The implementation of the POPI Act was also delayed with little or no explanation. The POPI Act was enacted in 2013 and in April 2014 only a few sections came into effect. The sections that came into effect include:

- **Section 1** which covers definitions and purposed
- **Part A of Chapter 5** which makes provisions for the appointment of the information regulator, including its duties, roles and resourcing. In October 2016, the President appointed members of the information regulator for a 5-year term effective from the 1st of December 2016.
- **Section 112 (Regulations)** which gives the Minister of Justice and Constitutional Development and Information Regulator the powers to make regulations
- **Section 114,** which addresses transitional arrangements around POPI, has not come into effect. Section 114 gives a one (1) year grace period to ensure compliance with the provisions of Act. Such further delays are likely going to result in continued disregard of privacy issues in the digital environment. This poses the risk of continued non-compliance since there is no basis to influence change in institutional behaviour through legal sanctioning. This is a serious constraint to promoting integration,

interoperability and information sharing. This compromises government's digital transformation initiatives in the public service and society in general, thereby compromising efforts to transform to smart governance.

The Information Regulator is chaired by Advocate Pansy Tlakula, who at the time of appointment was serving as the Chairperson and Special Rapporteur on Freedom of Expression and Access to Information in Africa, and African Commission on Human and Peoples Rights (ACHPR) in the African Union. Her expert power, as well as the legitimate authority of the Information Regulator, is expected to influence public opinion, institutional behaviours and compliance. Here again, I argue that institutions and their leaders influence the effectiveness of regulative mechanisms.

5.5.5 Skills /human capital

Human capital is a key driver of e-government and ICT development. It is against this backdrop, that the United Nations uses human capital as one of the key indicators of e-government development. The UN Human Capital Index (HCI) "consists of four components, namely: (i) adult literacy rate; (ii) the combined primary, secondary and tertiary gross enrolment ratio; (iii) expected years of schooling; and (iv) average years of schooling" (United Nations, 2016:136). The weakness of the UN Human Capital Index is that it is limited to general literacy and ignores e-skills or e-literacy. It is possible to complete schooling and be literate without exposure to technology. This has been a reality for most developing countries. South Africa, for example, still has a significant population, about 38%, that live in rural and marginalised areas, the majority of which lack basic services and infrastructure such as electricity. South Africa has seen an increase in households that have access to electricity to about 84% from about 59 % two decades ago (Statistics South Africa, 2016). The majority of the 16% of households without access to electricity live in rural areas and informal settlements.

The majority are also poor with limited access to computer facilities due to lack of access to electricity and affordability among other factors.

E-literacy and e-skills (e-readiness) influence the use of e-government services and are enablers of the digital transformation of society and government as they enable citizens to fully participate and leverage the benefits of a smart society. Despite scoring high in the UN e-government Human Capital Index, South Africa is facing significant skills challenges. Many schools, especially in marginalised and rural areas, are not equipped with computers and lack teachers who are able to teach e-skills. According to Statistics South Africa (2016) only 3, 2% of schools in rural areas have access to the Internet. ICT and engineering skills still rank high in the Department of Higher Education and Training's list of scarce skills and occupations in high demand. South Africa is facing a perennial shortage of engineering and ICT skills among other skills that are critical in digital transformation due to inefficiencies in the basic and post-schooling education and training system among other things (MerSETA, 2016). Science, Engineering and Technology (SET) for example**,** only constitute 29% of the total enrolments in Higher Education Institutions. This is still relatively lower compared to some of the middle-income countries in the BRICS block such as India (42.6%) and Brazil (33.9%). South Africa's poor performance in mathematics and physical science education at the school level is a contributing factor in the failure to increase SET enrolments (Department of Science & Technology, 2016).

The government is transforming the post-school system which is an integral part of government's policies to improve the socio-economic status of its citizens through the "establishment of an institutional mechanism for skills planning" (South Africa, 2014:1). In driving digital transformation for socio-economic transformation, infrastructure and financial

resources are not adequate in achieving this goal. Socio-technical aspects such as the e-readiness of citizens, skills and citizen participation influence success.

5.5.6 Policy update and harmonisation

There are delays in the updating of South Africa's e-government strategy and policy framework which was published in 2001. With the rapid developments in ICT, the 2001 strategy is losing relevancy. New technological developments such as mobile government, emerging technologies like big data analytics and artificial intelligence, technology convergence and open government in connected and smart societies are not adequately addressed. Although newer policies such as the Integrated ICT Policy, address some of the shortcomings, there is an urgent need to update the e-government policy and strategy and harmonise it with newer policies and strategies. This is important considering that the Integrated ICT Policy is not a replacement of the 2001 E-government Policy. The National E-strategy also echoes the urgent need for "government to speed up the implementation of the e-Government strategy" South Africa, 2017:12).

Moreover, developments in newer policies and legislation have rendered provisions of certain legislation invalid. This is true of the ECT Act of 2002 that has had some of its provisions replaced by the Integrated ICT Policy and the POPI Act. There is, therefore, an urgent need to harmonise older legislation and policies with developments in new policies and legislation. The Integrated ICT Policy published in 2016 is yet to come into effect due to the need to amend provisions of the ECT Act. The call for public comments on the proposed amendments was published on the 17th of November 2017 and there are no indications as to when the process of amending the legislation will be finalised.

5.5.7 Policy implementation

Delays in the implementation of policy or legislative directives are a major concern in South Africa. The government, for example, failed to develop and implement a National E-strategy within the prescribed period as had been directed by the Electronic Communication and Transactions Act. Regulative mechanisms are not sufficient if there is no compliance. This suggests that legal sanctioning through regulative mechanisms alone, may not always be adequate in institutionalising the desired behaviour. The absence of a National E-strategy until the end of 2017 posed a serious risk for government's vision of a digitally inclusive society by 2030 as it meant that it had no legal sanctioned legitimacy or strategic framework to guide it.

Policies, legislation and strategies are important mechanisms as they guide the establishment of structures, activities, resources and other supporting mechanisms within institutions for institutionalising reforms. In Chapter 7, I discuss the extent to which some of the regulative mechanisms aimed at strengthening the integration of services and systems have met that goal. I also discuss how such mechanisms have paved way for allocation of resources, support and commitment from government departments to participate in e-government integration, interoperability and information sharing initiatives.

5.5.8 Information and communications infrastructure

Since the attainment of democracy in 1994, developing South Africa's social and economic infrastructure has been one of the South African government's priorities (South Africa, 2012). Infrastructure spending as a share of GDP increased to an average of 6.6 % between 2005 - 2015 from an average of 5 % between 1998/99 and 2004/05 (National Treasury, 2018). Despite significant spending on infrastructure in general, the quality of information and communication infrastructure in South Africa remains poor as reflected in the E-government Development Index which uses infrastructure development as one of the key indicators.

The lack of prioritisation of ICT infrastructure investment can be reasonably explained by understanding the socio-economic and socio-historic context of South Africa. To start with, South Africa is still struggling to address socio-economic challenges such as inequality, poverty and unemployment. A significant proportion of the population (14%) still live in informal settlements and an estimated 35% live in rural areas with limited access to basic amenities such as electricity, sanitation and clean water (World Bank, 2018). According to the 2016 public infrastructure spending report, a significant amount of spending on public infrastructure was on energy, water and sanitation and transport and logistics (South Africa, 2016).

Public pressure is mounting on the government to reduce poverty and improve the quality of life of its citizens as part of its social obligation. Democracy brought with it increased accountability for the government, which has to account to the public on its promises of equality, equity, social justice and alleviating poverty. Digital transformation, in reality, is therefore not an immediate priority for the majority of citizens who still lack basic services. To achieve political legitimacy, the South African government has been prioritising social and economic infrastructure development that has a direct impact in addressing citizens' demands for health care, housing, electricity and clean water. Social obligation in this instance is the basis for attaining legitimacy (Jacobson, 2009).

In a globalised world, there is no doubt that the international community plays a role in local transformation as evidenced by the role of international organisations such as the United Nations in influencing socio-economic development in member countries. Decisions are often made in the interest of a global development agenda largely influenced by a few powerful

nations. The lack of a common development agenda often leads to poor compliance in cases where such decisions are not considered a priority especially by developing countries that are lagging behind in social and economic development. The South African government's failure, alongside other African countries to meet the International Telecommunications Union's (ITU) deadline for digital migration is concerning. This failure is an example of how governments often find themselves having to find a balance between domestic priorities and international development agendas in developing policy and governance frameworks. Conflicting priorities often lead to poor conceptualisation and implementation of national policy, especially where resources are inadequate.

5.6 Summary

Regulative institutional mechanisms such as legislation and policies are often useful, but not infallible. Policy and legislation play an important role in influencing the behaviour of institutions and the people in them. The South Africa government has developed legislation and policy aimed at promoting digital transformation through integration, interoperability and information sharing by addressing security, privacy, trust, and technology and leadership constraints. The effectiveness of policy and legislation is affected by the resourcing and leadership of institutions tasked with implementing them. In South Africa, institutional leadership challenges have compromised institutions tasked with the implementation of government priorities. Regulative mechanisms are not always effective in achieving institutional goals. This suggests that legal sanctioning is not always sufficient in shaping the desired behaviour.

Normative mechanisms also shape institutions through shaping desired social behaviour through formal and informal rules, standards and norms. Cultural-cognitive changes in the form of beliefs, value systems and culture are also critical in shaping the desired social

behaviour in institutions. Regulative, normative and cultural-cognitive mechanisms complement each other in institutionalising desired behaviour. Undesired norms, practices, values and behaviour may need to be deinstitutionalised to pave way for the institutionalisation of new norms and cultural-cognitive elements. With the increase in connectedness and integration of physical and virtual dimensions due to technology advances in the 4th industrial revolution, the socio-technical approach will become more useful in understanding the changing dynamics. Governments, therefore, need to approach digital transformation with a clear understanding of the increasingly blurred boundaries between technology, society and humans. In Chapter 6 I discuss the labour market intelligence partnership initiative, a practical example of an e-government integration, interoperability and information sharing initiative in South Africa.

CHAPTER 6

THE LABOUR MARKET INFORMATION SYSTEMS CASE STUDY AND CONTEXT

6.1 Introduction

The South African government has recognised the role of integration, interoperability and information sharing in effective functioning, operational efficiency, governance and service delivery (see Chapter 5). The lack thereof has been cited as a barrier in increasing operational efficiency, planning, governance and service delivery in government. The Department of Higher Education and Training (DHET), for example, reported that planning in government has been compromised by the lack of integrated systems and information sharing across government (Department of Higher Education &Training, 2012).

The absence of integrated information systems has hampered efforts by the South African government to implement a credible institutional mechanism that provides credible skills demand and skills supply data for better skills planning (Department of Higher Education & Training, 2012). An institutional mechanism consists of "a coordinated combination of processes, institutional structures, technological infrastructure and human capacity, designed to achieve common policy goals" (Human Science Research Council, 2014:1). This has compromised the department's ability to deliver on its mandate and mission of developing "capable, well-educated and skilled citizens who are able to compete in a sustainable, diversified and knowledge-intensive international economy, which meets South Africa's development goals" (Department of Higher Education & Training, 2015:6) .

In 2010 the South African government came up with 12 outcomes which were to become key focus areas of policy. Outcome 5 speaks to the need to "develop a skilled and capable workforce to support an inclusive growth path through the establishment of a credible institutional mechanism for skills planning, among other measures" (Department of Higher Education & Training, 2012:1). The South African government saw an urgent need to "improve the credibility, validity, utility and integrity of the various data and management information systems, which are vital for the successful planning and implementation of the human resources development strategy for South Africa" (Human Resources Development Council of South Africa, 2012:1). A "credible institutional mechanism for skills planning will be achieved through the development of frameworks for standardization and cooperation regarding information on the supply and demand of skills in the country, and the development of integrated systems and system interfaces" (Department of Higher Education & Training, 2012:3). An integrated institutional mechanism is pivotal in achieving the government's goal of developing "a skilled and capable workforce to support an inclusive growth path" (Department of Higher Education & Training, 2012:1). The LMIP is intended to be that credible mechanism for skills planning in South Africa.

6.2 Purpose of the Chapter

The purpose of this chapter is to introduce the LMIP as a revelatory case to understand the factors that have impacted the implementation of a Labour Market Information System in South Africa with a focus on the integration and interoperability of systems and information sharing. The Labour Market Intelligence Partnership (LMIP) project is used as a revelatory case to understand issues confronting the South African government in its bid to integrate and interoperate its information systems as part of its digital transformation and smart governance agenda. It is a practical case study of issues confronting government in its bid to institutionalise reforms aimed at promoting transformation.

In building credible mechanisms for skills planning, the integration and interoperability of information systems and information sharing are identified as key enablers. Two of the three sub-outputs of output 5.1 (building a credible institutional mechanism for skills planning), speak to the need to develop integrated information systems in government. Sub-output 5.1.2 for example, addresses the need to develop mechanisms to interface operational systems while sub-output 5.1.3 speaks to the development of strategic management information systems (Department of Higher Education & Training, 2012). The integration of information systems and information sharing in government is set to play an important role in developing a reliable Labour Market Information System (LMIS). A labour Market Information /Intelligence System (LMIS) is defined as "the technical processes associated with the collection, collation, analysis and dissemination of information and intelligence and skills planning focuses on how labour market intelligence is utilized to inform decision making processes about how resources are allocated for skills development and how different actors influence this process" (Powel & Reddy, 2015:1). This definition, however, falls short in addressing non-technical processes such as organisational and social elements in an information system. In this study, the definition is expanded to include organisational and social processes.

This chapter uses documents as its primary source of evidence. Documents analysed include national policies and strategies addressing outcome 5 of the South African government's 12 strategic outcomes. Strategic plans of national government departments selected to participate in this study are also included in the analysis. The key documents analysed are summarised in Table 20. Other documents used such as LMIP presentations, ministerial speeches and reports and project documents are listed in the references. Evidence collected was triangulated with

findings from the literature in Chapter 2 and interview data that is analysed and discussed in Chapter 7.

6.3 The Labour Market Intelligence Partnership (LMIP) project in South Africa

The Labour Market Intelligence Partnership (LMIP) project is a practical example of government's attempt to improve governance, operational and strategic efficiency through collaboration, information sharing and the integration and the interoperability of e-government systems (among other things). Speaking at the launch of the project, the then Minister of Higher Education and Training Dr Blade Nzimande reiterated that the aim of the LMIP project was to integrate information systems for skills planning purposes. The integration of information systems was critical for building "reliable data indicating skills needs, supply and demand in our labour market in a manner that will enable our country, including government and business, to plan better for human resources development needs for our country.*"* (Department of Higher Education & Training, 2012:2). This is an example of how the South African government has recognised the role integrated and interoperable information systems, and information sharing play in promoting efficiency and collaboration in government planning, operations, service delivery and governance.

In this section, I discuss some of the regulative, normative and cultural-cognitive mechanisms that have been central in the establishment of integrated information systems for skills planning. Institutional leadership, institutional structures, resourcing, collaboration and regulation are the key mechanisms identified from an analysis of documents.

6.3.1 Institutional and political leadership

Institutional and political leadership plays an important role in ensuring the success of integration, interoperability and information sharing initiatives. Institutional leadership creates

common goals, coordinates, fosters cohesion, avails resources and facilitates the institutionalisation of normative mechanisms such as standards, norms, procedures and rules in the institutionalisation process to influence the desired behaviour (see Chapter 2).

In delivering outcome five (5) (a skilled and capable workforce to support an inclusive growth path) of the government's twelve (12) priorities, the Department of Higher Education and Training (DHET) has assumed an institutional leadership role. The Department of Higher Education and Training assumed the responsibility for the **coordination** of the LMIP project, bringing together various actors such as other government departments, universities, government agencies, research institutions and industry (Department of Higher Education & Training, 2017).

The Department of Higher Education and Training has also provided platforms to strengthen **information sharing** and **collaboration** through seminars, workshops and policy roundtables. Between 2012 and 2016 the LMIP, for example, had produced 25 research reports; 41 research papers;18 journal articles; 5 books (draft versions); 14 policy briefs; 23 LMIP briefings that showcase cutting-edge research modalities emanating from the LMIP; 74 presentations (Department of Higher Education & Training, 2017). This has enabled role players with diverse beliefs, value systems and mandates to come together in a bid to create a common goal for setting the skills development agenda in South Africa.

Outputs of the LMIP such as policy briefs, research papers and proposals for an integrated post-school education and training system were a direct outcome of the dialogues (Department of Higher Education & Training, 2017). The creation of a research repository http://www.lmip.org.za) hosting labour market-related research can also be seen as a

mechanism for promoting information sharing and the dissemination of information and knowledge critical for creating a credible institutional mechanism for skills planning.

Institutional leadership also creates common goals in promoting the success of transformative projects and fostering social cohesion, especially where role players have diverse value systems and mandates. The Labour Market Intelligence Partnership, for example, is composed of diverse stakeholders such as government departments, government agencies, research institutions, higher education institutions, industry and other social partners with diverse priorities and mandates. Social cohesion thus plays an important role in the adoption of common goals, reinforcing commitment, embracing diversity and constructive debate in policy making and implementation. According to Easterly, Ritzen and Woolcock (2006:4), "the inclusiveness of a country's communities and institutions including its laws and norms can foster cohesion". Social cohesion in institutions like the government with multi-stakeholders with diverse interest is essential in the institutionalisation of reforms. An independent evaluation of the LMIP concluded that stakeholders' perceived the LMIP as having been relevant to their needs and was responsive to the national labour market needs and priorities (Department of Higher Education & Training, 2018). The extent of cohesiveness was not measured as it was beyond the scope of the study.

Power dynamics are also likely to be observed in such complex institutions with diverse stakeholders, some wielding power and influence. Institutional leadership in such instances needs to play a pivotal role in balancing power to avoid the over domination of powerful actors and the exclusion of less powerful actors.

Senior political leadership commitment plays an influential role in the implementation of government initiatives because of their political power and legitimate authority. Power and politics are important elements in collaboration since the "participants remain relatively autonomous and must be convinced to act even though there is no legitimate authority that can demand co-operation" (Phillips, Lawrence & Hardy, 2000:25). In launching the Labour Market Intelligence Partnership project, the then Minister of Higher Education and Training Dr Blade Nzimande, using his legitimate authority as the Minister of Higher Education and Training, emphasised the role of systems integration, data integrity and collaboration in establishing a credible institutional mechanism for skills planning (Department of Higher Education & Training, 2012) thus lending legitimacy to the project.

Inter-organisational relations largely depend "on the use of legitimate authority as a control mechanism, particularly in the case of relations between state agencies and other organizations" (Phillips, Lawrence & Hardy, 2000:25). Skills development initiatives such as the LMIP have also received support from senior leaders such as the then Deputy President of South Africa, Cyril Ramaphosa who noted in one of his speeches that building a credible skills development system was critical for South Africa's growth (The Presidency, 2017). The independent evaluation of the LMIP also concluded that longevity of the LMIP relied on continued political support.

The Minister of Higher Education and Training is also accountable to the President and cabinet for the delivery of outcome 5 which is a key performance indicator for the Ministry. This is set out in the 2014- 2019 Medium Term Strategic Framework (MTSF) and articulated in DHET's 2015/16 – 2019/20 Strategic and Annual Performance Plans. The Medium Term Strategic Framework (MTSF) is Government's strategic plan for the 2014-2019 electoral term and its

aim is to ensure policy coherence, alignment and coordination across government plans, as well as alignment with budgeting processes. It sets out performance agreements between the President and each Minister which reflect the relevant actions, indicators and outcomes (South Africa, 2014). Accountable leadership fosters a culture of accountability and high performance. This is in support of the NDP's vision of creating a skills development system that is "supported by effective governance mechanisms to promote coordination and collaboration" (South Africa, 2012:316). Accountable leadership is also essential in building trust, an essential element in delivering programmes that require the collaboration of different role players. The role of trust in the implementation of reforms was discussed in Chapter 2 and is further unpacked in Chapter 7.

Furthermore, political leadership plays an important role in fostering social and political cohesion in the institutionalisation of reforms. Governments are political institutions and therefore the role of politics, including political cohesion cannot be overemphasised in the institutionalisation of reforms In 2010, the then Minister of Higher Education and Training, Dr Blade Nzimande signed delivery agreements for output 5.1 (Establish a credible institutional mechanism for skills planning) with 9 ministries, identified as key partners. The commitment of top political leadership at a ministerial level or above in political institutions such as government is essential in institutionalising reforms that require collaboration and political commitment.

Coercive mechanisms at a political level are however not adequate in promoting compliance and collaboration. According to Huddy (2013:36), "One of the crucial ingredients in the development of political cohesion is the existence of a strong, internalized subjective group identity." Lack of consistent participation of stakeholders from other departments, however,

remained a concern (Department of Higher Education & Training, 2017). Poor participation compromises integrated planning and coordination of collaborative initiatives such as the LMIP.

6.3.2 Institutional structures

Structures in institutions play a pivotal role in the institutionalisation of reforms. The proposed establishment of the centralised skills planning unit within the Department of Higher Education and Training can be regarded as a formal institutional structure for improving the coordination of information, and the integration and interoperability of systems across government. The establishment of formal structures is an important step in the institutionalisation process (Tolbert & Zucker, 1996).

Formal structures assist in the coordination of resources and activities in institutions. Establishing formal structures is intended to address the capacity, poor coordination and the fragmented approach in the implementation of transversal programmes that cut across several national government departments. Evidence, however, suggested that the implementation of such structures has been constrained by financial resources, skills and technical capability and poor coordination. In 2015 the LMIP produced a roadmap for setting up a centralised skills planning unit (Powel & Reddy, 2015). The roadmap is however not clear on the timelines for implementation. This may result in challenges in the monitoring of implementation.

The important role of pre-existing and long-established institutional structures in fostering collaboration, and consequently in the development of the solutions to problems identified (Phillips, Lawrence & Hardy, 2000) is probed further in Chapter 7. The existence of strong internalised subjective group identity and norms in government and their influence on the institutionalisation of reforms is further discussed in the next chapter.

6.3.3 Resourcing: funding

The Labour Market Information System "needs to be supported by effective funding mechanisms to promote coordination and collaboration" (Department of Higher Education & Training, 2012:316). The Labour Market Intelligence Partnership initiative is funded by the Department of Higher Education and Training as a key mechanism for the delivery of output 5.1. The LMIP project was awarded R 66, 5 million by the Department of Higher Education and Training to resource the project and associated activities such as research, seminars and policy roundtables and expertise discussed above. Without adequate resourcing, such initiatives are bound to fail. The LMIP evaluation report, however, concluded that the funding allocated to the project was adequate and cited continued funding beyond the lifespan of the project as critical in ensuring the longevity of the LMIP initiative (Department of Higher Education & Training, 2017). The continued funding of the LMIP initiative beyond the project lifespan was not clear from documents as the function is set to be integrated within the Department of Higher Education and Training department structures.

The risk with government initiatives that span across several departments is that costs can easily spiral out of control due to delays and other unforeseen complexities. Despite delays in the conclusion of the LMIP project which was extended by two years, the evaluation concluded that this had no direct impact to cost and the overall budget of the project (Department of Higher Education & Training, 2017). Costs incurred may have been indirect. This impacts the efficiency of the organisation and its ability to deliver on some of its mandates.

6.3.4 Resourcing: skills

The Human Sciences Research Council (HSRC) leads a research consortium to build capacity for supporting the development of a credible mechanism for skills planning in South Africa. The HSRC, a leading human sciences research institute in Africa, has assembled a multi-

disciplinary team of experts to provide intellectual support to the LMIP initiative. In recognition of the role of research and new knowledge production a total of 42 bursary units were awarded for Masters and Honours degree students doing research in relevant disciplines such as information systems, statistics, economics, education and econometrics as part of capacity building for the LMIP project at a total cost of an estimated R5 million. The knowledge outputs through research, policy roundtables and seminars have formed the basis for informing policy direction (Department of Higher Education & Training, 2017).

The centralised skills planning unit which is tipped to be resourced with a multidisciplinary team of data scientists, information systems specialists, labour market analysts, statisticians and economists etc. is also set to bolster the skills capability. Details surrounding the form and structure of the centralised skills unit remain sketchy. Skills capacity was also identified as critical in ensuring the longevity of the LMIP in an independent evaluation report (Department of Higher Education & Training, 2017).

6.3.5 Collaboration

The responsibility for the development of skills for the economy is a joint effort between various government departments, institutions of higher learning, social partners such as labour unions and industry. Collaboration between the national government departments responsible for the development and implementation of policy and programmes is important in laying a strong foundation for building a credible institutional mechanism for skills planning. In the delivery of output 5.1 (Establish a credible institutional mechanism for skills planning), several government departments were identified as key delivery partners. Information and data on the demand and supply of skills in the economy reside with various departments and is informed by various government strategies. It is therefore critical for government departments to

integrate and interoperate information systems for efficient planning, efficient use of resources, decision making, governance and delivery of services that benefit its citizens.

Inter-organisational collaboration is a key driver of integration. Inter-organisational collaboration "involves sets of negotiations that are demanded by the lack of predefined institutional roles that accompany market and authority based relationships" (Phillips, Lawrence, Hardy, 2000:25). The LMIP calls for an integrated approach to building an institutional mechanism for skills planning. The role of inter-organisational collaboration is not limited to reproducing institutionalised rules and resources but also it's potential to provide creative and innovative solutions for addressing complex problems (Gray, 1989). This is critical when dealing with complex challenges such as skills that demand governments to develop innovative ways to address such challenges. Seminars, policy roundtables and colloquiums were held regularly to promote collaboration. Between 2013 and 2017 an estimated 14 policy briefs, 23 briefings and 74 presentations were some of the outputs of some of those engagements (Department of Higher Education & Training, 2017).

Moreover, public institutions have a reputation for being rigid, bureaucratic, and slow to transform and adopt innovations. Their successful transformation is therefore likely going to be influenced by how they respond to these barriers as a collective by pulling together resources, expertise and developing new structures that address these challenges. Below is a list of departments identified as key partners of the Department of Higher Education and Training in the delivery of output 5 of the government's 12 outcomes informing policy.

1. Department of Basic Education.
2. Department of Economic Development
3. Department of Finance

4. Department of Home Affairs
5. Department of Labour
6. Department for Public Service and Administration
7. Department of Rural Development and Land Reform
8. Department of Planning, Monitoring and Evaluation
9. Department of Science and Technology
10. Department of Trade and Industry

The departments that were selected to participate in this study and the sampling procedure used is discussed in Chapter 4 (research methodology). Evidence gathered however indicated that not all departments that were identified as key partners participated in the initiative. Lack of consistent participation of some key stakeholders was cited as one of the constraints in the LMIP (Department of Higher Education & Training, 2017).

6.4 National policies and strategies

National policies and strategies provide regulative mechanisms which influence adoption and compliance when implementing new reforms (see Chapter 2 and Chapter 5). In Chapter 5 policies, legislation and standards that address the digital transformation of government are discussed. Sector-specific policies are developed within a national policy framework hence they should address priorities identified within cross-sectoral or the national policy framework. This is critical in ensuring that national priorities such as digital transformation, inclusive growth, and skills etc. are translated into sectoral policies and strategies where implementation takes place.

In this section, I discuss skills development policies and legislation that informed the development of a Labour Market Information System. The focus is on exploring the extent to

which these regulative mechanisms address issues of integration, interoperability, information sharing and collaboration. The National Skills Development Strategy, White Paper on Post School Education and the proposed new Skills Development Strategy are some of the policies and strategies reviewed. These policies are instrumental regulative mechanisms in realising the goal of an integrated credible mechanism for skills planning in the context of achieving national priorities such as economic growth. The policies and strategies are highlighted in Table 21.

Table 21: Documentary evidence

National Policies	**Purpose**
National Skills Development Strategy (NSDS) III (2011)	First strategy that provided "a unique opportunity for South Africa country to achieve some of its goals towards an integrated education and training system" (Department of Higher Education & Training, 2011:1)
National Development Plan (2012)	South Africa's medium to long-term strategic plan to guide socio-economic development and growth (South Africa, 2012).
White Paper on Post-School Education and Training: Building an Expanded, Effective and Integrated Post-School System (WP-PSET): (2014)	Envisages the development of an "integrated system in such a way that the different components complement one another, and work together to improve the quality, quantity and diversity" (Department of Higher Education & Training, 2014:1).
Medium Term Strategic Framework (MTSF) (2014)	The "aim of the MTSF is to ensure policy coherence, alignment and coordination across government plans as well as alignment with budgeting processes" (South Africa, 2014:1).
Proposed New National skills Development strategy (2015)	Gives "effect to the goals of the White Paper for Post-School Education and Training: Building an Expanded, Effective and Integrated Post-School System" (Department of Higher Education & Training, 2015:1).
National Department strategies	**Purpose**
• Department of Higher Education and Training Strategic Plan (2015/16 -2019/20) • Department of Trade and Industry Strategic Plan (2015 -2019) • Department of Home Affairs Strategic Plan (2015 -2020) • Department of Telecommunications and Postal Services Strategic Plan (2013 -18) • Department of Public Services and Administration Strategic Plan (2015-2020) • Department of Science and Technology Strategic Plan (2015-2020)	National department Strategic Plans "identify strategically important outcomes orientated goals and objectives against which public institutions' medium-term results can be measured and evaluated by Parliament, provincial legislatures and the public" (South Africa, 2010:1).
Other documents	**Purpose**
• DELIVERY AGREEMENT 1 **For Output 5.1** – Establish a credible institutional mechanism for skills planning	A "negotiated charter reflecting the commitment of key partners to work together in producing the mutually agreed-upon outputs which will contribute to achieving Outcome 5 (*A skilled & capable workforce to support an inclusive growth path").*(Department of Higher Education & Training, 2010:1)

6.4.1 National Skills Development Strategy (NSDS) III (2011)

The National Skills Development strategy III implemented in 2011 was government's first official strategy that provided a "unique opportunity for our country to achieve some of its goals towards an integrated education and training system" (Department of Higher Education & Training, 2011:3). Acknowledging the absence of a credible institutional mechanism for skills planning, including the fragmentation of information systems, one of the goals set out in NSDS III is "the establishment of a credible institutional mechanism for skills planning" Department of Higher Education & Training, 2011:3. The strategy plans to; " (i) establish a standardised framework for determining skills supply and shortages and (ii) develop an integrated information system for skills supply and demand across government" (Department of Higher Education & Training, 2011:11).

The implementation of the National Skills Development strategy III followed the integration of higher education and training and skills development into a single Department of Higher Education and Training (Department of Higher Education & Training, 2011). This was part of government's response to the fragmentation of services and systems that was compromising its ability to achieve its goals of reducing poverty, unemployment and inequality through increasing access, quality and efficiency in the post-schooling education system among other things. Fragmentation made the coordination of government priorities challenging and promoted inefficiencies, conflict, duplication of effort in policy implementation (Department of Higher Education & Training, 2011).

The Labour Market Intelligence Partnership project is a direct outcome of the National Skills Development strategy III. This reflects some degree of translation of national policy priorities

in sectoral strategies. Implementation, as shall be discussed in Chapter 7, remains a significant challenge.

6.4.2 White paper on Post -School Education and Training: Building an Expanded, Effective and Integrated Post-School System (WP-PSET): (2014)

The White Paper on Post-school Education and Training envisages the development of an "integrated system in such a way that the different components complement one another, and work together to improve the quality, quantity and diversity" of skills development in South Africa. One of the main policy objectives of the white paper is to establish "a single, coordinated post-school education and training system" (Department of Higher Education & Training, 2014, xi). This stresses the importance of collaboration and integration of government programmes, systems and services, a point stressed in the National Development Plan of 2012. The need to integrate services and collaborate consequently demands that government departments and agencies share information, integrate and interoperate their information systems to achieve the goal of a single, coordinated post-school education and training system.

The White Paper also paved way for the development of the new National Skills Development Plan, promising greater integration which was due for implementation in 2016 but was postponed for a further four years for further consultations. The proposed strategy is discussed in the next section. Here we observe delays in the implementation of policy as a significant constraint in achieving the goal of an integrated and interoperable government. Some of the constraints that have compromised transformation include capacity within institutions. Some of the proposed changes such as the creation of new structures may require changes and institutionalisation of new norms, practices and works systems. This is often not easy in rigid institutions such as government.

6.4.3 Proposed New Skills Development Strategy/ Plan (2015)

The proposed skills development strategy, published in November 2015, “gives effect to the goals of the 'White Paper for Post-School Education and Training: Building an Expanded, Effective and Integrated Post-School System' (WP-PSET) released by the Minister of Higher Education and Training in 2014” (Department of Higher Education & Training, 2015a:1). The “new skills development strategy proposes that the role of government departments be strengthened to enhance the integration of sectoral strategies into sector plans so that these departments are able to prepare training plans in line with centrally determined methodologies” (Department of Higher Education & Training, 2015a:1). This emphasis on the integration of sectoral strategies calls for stronger collaboration in the planning and implementation of government priorities and programmes. Information sharing, integration and interoperability of information systems, therefore, have a significant role in fostering collaboration in government. What is missing, is measures that government is proposing to put in place to integrate services and systems in government given the current state of fragmentation. Subsequent to the publishing of the draft strategy, in 2017 government released a proposal for the National Skills Development Plan whose principles and goals are to advance an equitable and integrated system, greater inclusivity and collaboration, rationalising the system and promoting accountability. At the time of writing this thesis in October 2018, the strategy had not been finalised for implementation.

6.5 Standards and frameworks

The adoption of common standards is widely used in improving integration and interoperability of e-government information systems (Dos Santos & Reinhard, 2012). The adoption of common standards and frameworks has been identified as one of the mechanisms for strengthening the development of an institutional mechanism for skills planning. It is against this backdrop that the adoption of common standards such as the Organised Framework of

Occupations (OFO) adopted in 2005 and its subsequent improvement over the years is set to improve the quality of data and information if there is adherence by government departments. What is however concerning is the continued use of multiple standards across government. Statistics South Africa, which provides national statistics, for example, uses the South African Standard Classification of Occupations (SASCO) while the Department of Higher Education and Training uses the Organised Framework of Occupations (OFO). This has created problems in sharing and using information. The use of standards as a normative mechanism is therefore compromised if there is no standardisation of frameworks used.

On the 29th of July 2015, I had the opportunity attend one of the media sessions where the Statistician General released the official statistics of the 2015 Quarterly Labour Force Survey at the Government Communications Information Systems Offices in Pretoria South Africa. I posted a question to the Statistician-General as to why there was a lack of common standards across government. Responding to the question, the Statistician-General noted that the lack of common standards is indeed a cause for concern and attributed that to different reporting requirements across different government departments. The Statistician-General also indicated that as the authority for national accounts, data and statistics, it the responsibility of Statistics South Africa to set up standards for reporting national statistics or national accounts data. To address this concern, the Statistician-General indicated that there were plans to put legislation to ensure that common standards are adopted and that there is compliance across government. It remains unclear as to which legislation Statistics South Africa is in the process of developing. Policy and legislation development and implementation in South Africa is a complex process and lengthy process. Statistics South Africa was invited to participate in the study but did not respond to the request.

Delays in the development and implementation of legislation (as discussed in Chapter 5) remains a serious threat in the implementation of policy and legislation as a coercive mechanism in promoting transformation in government. The lack thereof also compromises the effectiveness of normative mechanisms such as norms and standards. This is important in the earlier stage of institutionalisation where variance in implementation and structure failure rate is high (Tolbert and Zucker, 1996).

6.6 Discussion of results

In this section, I discuss the implementation of policy and other mechanisms that seek to establish an integrated and differentiated post-school education and training system in South Africa. Institutional Theory is used as a lens for understanding some of the institutional barriers confronting the South African government. Using the Institutionalisation Process Framework by Tolbert & Zucker (1996), an attempt is made to understand the barriers faced in the institutionalisation of such reforms.

6.6.1 Policy implementation

Policy implementation delays are concerning and are a serious constraint to achieving government's goal of a 'credible integrated institutional mechanism for skills planning' in government. The New Skills Development Strategy that is expected to drive the integration of the post-school education and training system is still yet to be finalised and implemented. The proposed strategy initially scheduled to be implemented in 2016 was only published in November 2015 for public comments. The Draft National Skills Development Plan was only published in December 2017 for public comments, 2 years after the 2015 draft New Skills Development Strategy was published for public comments. At the time of writing this thesis, the strategy hadn't been finalised for implementation.

The delays resulted in the initial extension the Skills Development Strategy (III) for a further two years from March 2016 to March 2018 to allow for consultation. In December 2016 the Minister of Higher Education and Training issued another notice extending the NSDS (III) for a further two years from March 2018 to March 2020 on the realisation that the plan was not ready for implementation. The challenges experienced with the implementation extend beyond the scope of this study as it is broader than issues of integration, interoperability and information. This highlights the complexity of the problem. This problem is therefore not unique to e-government but is an institutional challenge which requires a more holistic approach. In dealing with some of the challenges in e-government development, practitioners and academics, therefore, need to extend beyond technology issues so as to understand the nature and extent of some of these challenges.

Policymaking in government is a complex process which involves consultations, comments by the public, approval by the responsible minister, approval by parliament and the President of the country before it can be implemented. The consultation process in policymaking and implementation is essential in ensuring the buy-in of key state actors, including the public, as the rejection of policy often makes implementation more challenging.

Government policies and strategies make reference to the importance of integrating systems as a pre-requisite in establishing a credible institutional mechanism for skills planning, but evidence suggests few measures have been put in place to integrate systems. Information systems still remain fragmented in the post-school education and training system. Progress has been slow due to a lack of a clear implementation plan. Policy as a regulative mechanism is not sufficient if not supported by mechanisms to institutionalise it. The success of policy

reforms largely depends on the implementation of supportive mechanisms such as structures, institutional leadership and resources.

6.6.2 Trust issues

Trust remains a serious concern in the successful implementation of policy and government programmes. Trust is important because it serves as the "creator of collective power" (Gamson, 1968: 42). Trust “enables the government to make decisions and commit resources without having to resort to using coercive mechanism or obtain approval of citizens for every decision” (Mishler & Rose, 1997:419)**.** The New Skills Development Strategy proposal that suggests the need for integration and centralisation of services and systems in the new skills development strategy has been received with some suspicion and reservation by various stakeholders. A significant example is the integration and centralisation of the skills funding system which has been criticised by some stakeholders due to concerns around efficiency in administration (MerSETA, 2016). The lack of trust is one of the factors preventing the full institutionalisation of policy reforms which ensures the full entrenchment of established structures, norms and values in institutions. Trust is essential in creating shared beliefs, value systems and norms especially during transformation or institutionalisation of reforms in complex institutions.

There is little evidence from documents on inter-organisation (government department to government department) trust issues in integration, interoperability and information sharing. This issue of inter-organisation trust was probed further through interviews with participating government departments. Documents are often not able to reveal such social issues that might be concealed deep within organisational structures, norms, value systems relations and processes. Moreover, the relative mutuality of power relations between the organisations and their influence in cementing trust as claimed by Marchington and Vincent (2004) will be explored further in the next chapter. This is particularly important in public institutions that

derive their power from legislative and constitutional mandates, and power dynamics are therefore likely to be evident.

6.6.3 Collaboration challenges

Studies by Marchington and Vincent (2004:1029) found that the majority of the literature on inter-organisational relations and collaboration assumed that organisations operate as "relatively autonomous and cohesive units that are unimpeded by wider institutional norms governing the industry as a whole". From the documents analysed, some departments identified as key partners in achieving output 5 seem to have played a minimal role (Department of Higher Education & Training, 2017). The integration of systems in government is a collaborative effort that requires the commitment and collaboration of all government departments in pulling together resources and expertise in implementing such government initiatives.

The extent of collaboration in the resourcing, coordinating, planning and commitment of human capital in the LMIP project was not clear from the documents analysed. Furthermore, according to Phillips, Lawrence and Hardy (2006:38), "for collaboration to produce change in an institutional field, its participants must hold the resources necessary to effect coercive, mimetic or normative isomorphism". The role of some of the departments identified as 'key partners' in planning and funding the project was not evident.

The lack of collaboration suggests that full institutionalisation which is characterised by social cohesion and integration, among other attributes, hasn't been reached. Trust in inter-organisational relations is viewed as a code of social interaction (Marchington & Vincent, 2004). To institutionalise reforms, collaboration and the establishment of formal structures, including the integration of systems and services, is essential. The recognition of the need to integrate government programmes, services and systems, and collaboration to improve service

delivery is a step in the right direction. The recognition of the need to institutionalise reforms is consistent with pre-institutionalisation stage (Habitualisation) where new structures are set up in response to a set of problems which are formalised in policies and procedures of the organization or organisations facing similar problems (Tolbert and Zucker, 1996). Data from interviews were used to corroborate this claim in the next chapter.

The minimal involvement of some relevant departments responsible for digital transformation is one of the factors that have hindered progress in the integration of information systems. This raises questions as to whether the national strategic priorities articulated in the NDP and Medium Term Strategic Framework are translated into national departments' strategic plans and priorities. An analysis of the strategic plans of government departments included in this study found that national strategic priorities such as skills for inclusive growth are better translated in strategic plans of those departments with a mandate that links directly to that national priority. Significant examples include the Department of Higher Education and Training (2015b), Department of Home Affairs (2015) and the Department of Trade and Industry (2015). Reasons for this was probed in interview discussions. Collaboration is more likely between public institutions that share a common mandate. This claim is substantiated by Marchington and Vincent, (2004:10129) who argue that "trusting, OCR [Organisation Contractual Relations] type relations are more likely to be produced and reproduced when there are strong institutional forces promoting common obligations on both parties". This is especially true in light of pressure to achieve performance targets by government departments who, in the majority of cases, are facing resource constraints as articulated in some of the government departments strategic plans analysed.

This study found little evidence of the participation of the Department of Telecommunications and Postal Services and its agencies such as SITA in the LMIP project. This is concerning as the department and SITA drive the digital transformation agenda, including integration and interoperability in government. An opportunity has been missed as the Department Telecommunications and Postal Services, Department of Public Services and Administration and SITA are responsible for coordinating digital transformation, including the integration and interoperability of systems. The question that remains is how the integration and interoperability of systems will be achieved without the involvement of key departments responsible for guiding the implementation of such reforms? The lack of involvement or collaboration is discussed in the next chapters.

Government departments are inter-dependent in delivering their mandates that contribute to national priorities as set out in the NDP and Medium Term Strategic Framework 2014-2019. The lack of collaboration stands in the way of transforming government whose effective functioning is dependent on the ability of its various institutions to work together in improving service delivery. The Department of Telecommunications and Postal Services in its strategic plan (2013 – 2018) acknowledged the weakness in stakeholder relations as a serious risk in delivering its mandate. As a mitigation strategy, the department is developing an integrated external relations plan for inter-governmental relations, stakeholders and communications (Department of Telecommunications and Postal Services, 2015c). The effectiveness of this mitigation strategy is however still yet to be seen as it might be compromised by other institutional issues that extend beyond stakeholder engagement.

6.6.4 Institutionalising a credible mechanism for skills planning

I use the institutionalisation process framework by Zucker and Tolbert (1996) (see Chapter 3) to understand the institutionalisation of a credible mechanism for skills planning in South

Africa. This analysis is based on qualitative evidence collected through an extensive analysis of documents.

Pre-institutionalisation stage (current state) - In 2010, the government identified the need to establish a credible institutional mechanism for skills planning. The immediate problem confronting government was the fragmentation of systems and poor flow of data and information across government departments. This prompted the conceptualisation of the Labour Market Intelligence Partnership project. New structures and other supporting mechanisms were also established at this stage. In 2012, for example, the Labour Market Intelligence Partnership project was launched. This was accompanied by the development of other mechanisms such as frameworks and policies to support the establishment of a credible institutional mechanism. The majority of these policies are yet to be finalised. Using Tolbert and Zucker's (1996) framework, this stage closely matches the pre-institutionalisation stage where the need for social integration and creation of formal structures is identified but the risk of failure is often high due to lack of cohesion and lack of deep-rooted structures. This is, however, an important stage where leadership needs to foster cohesion, trust, put in place regulative and normative mechanism, and establish formal and informal structures to manage transformation and the risk that comes with it. Reinforcing commitment from key actors and strengthening inter-organisational relations is also critical at this point. Change management at this stage is also necessary due to resistance brought by structural and other changes synonymous with this stage.

The **semi-institutionalisation stage** - At this stage social cohesion, collaboration or participation of key partners is likely to increase. Using the LMIP as a case study, this stage, for example, should be characterised by an increase in the participation of key partners in the project. Mechanisms that promote collaboration also help to foster greater participation and

social cohesion. Social cohesion according to Easterly, Ritzen and Woolcock (2006:1), "determines the quality of institutions, which in turn has an impact on whether and how pro-growth policies are devised and implemented". The expected outcome of this stage is the implementation of mechanisms such as policies, strategies, standards, structures and models aimed at supporting the establishment of a credible institutional mechanism for skills planning. The proposed centralised skills planning unit is also one mechanism that is a direct outcome of the LMIP engagements among key stakeholders. Policies, standards and structures to support the institutionalisation of a credible skills planning mechanism are yet to be finalised for implementation. The participation of some of the key role players in the project also remained weak (Department of Higher Education & Training, 2017). This is evidence that the process is not yet at the semi-institutionalisation stage. Regulative mechanisms for institutionalising the proposed reforms are yet to be finalised.

The **full institutionalisation stage** (desired future state) is more likely going to be characterised by the full and seamless integration of systems and services leading to a "credible institutional mechanism for skills planning". In this stage planning, coordination and implementation of government programmes and priorities is more streamlined. This stage is likely going to be characterised by the free flow of information, knowledge and innovation across organisations. There is also greater social cohesion and structures, norms and value systems are deep-rooted and shared across organisations. Collaboration and inter-organisational relations are driven by normative mechanisms with little or no need to use coercive mechanisms to influence the desired behaviour. Greater stability and efficiency is more likely to be experienced at this stage. Achieving full institutionalisation will, however, require that norms and other cultural-cognitive elements that hinder transformation be

deinstitutionalised. Deinstitutionalisation, however, needs to start at the pre-institutionalisation stage.

6.7 Summary

The integration and interoperability of systems and information sharing enable government departments to effectively collaborate in addressing national priorities such as the development of a skilled workforce for driving socio-economic prosperity, reducing poverty and unemployment. The implementation of regulative and normative mechanisms such as policies, standards and frameworks are some of the institutional mechanisms that have been put in place to enhance collaboration, integration and information sharing. The implementation of policy, frameworks and government strategies, however, remain a significant challenge. Constraints include delays, mistrust of government intentions, poor resourcing, collaboration and participation of key players in government. All these are consistent with the pre-institutionalisation (Habitualisation) stage characterised by weak cohesion, weak structures and instability.

Top political leadership plays a critical role in fostering integration, social and political cohesion. Top political leadership also plays an essential role in allocating resources and implementing formal structures for institutionalising policy reforms, desired behaviour, practices, norms and systems in public institutions during transformation. An understanding of the interplay between power and politics, in the institutionalisation of new structures, systems, norms and value systems has the potential to contribute to theory. This is discussed in greater detail in the next chapter. This chapter discussed issues surrounding the institutionalisation of reforms in a broader sense as the institutionalisation of reforms in government is impacted by a myriad of institutional issues. Understanding the broader context is critical in developing and understanding phenomena such as digital transformation as it is influenced by complex factors

and the broader social, political, economic and legal context among other factors. Chapter 7 discusses and analyses results from the interviews, literature and documents collected as part of evidence.

CHAPTER 7

DISCUSSION AND ANALYSIS OF RESULTS

7.1 Introduction

In this chapter, I analyse and discuss evidence from primary data collected through face to face semi-structured interviews, documents and literature. Primary data was collected through semi-structured interviews with twelve senior managers in national government departments. The senior officials who participated in the study are responsible for research, policy implementation, Information and Communication Technology, digital transformation, information and knowledge management, and intergovernmental relations. Two e-government experts with experience in the development and implementation of e-government projects and other digital transformation projects were also included in the study to solicit their expert views on issues surrounding digital transformation in South Africa.

This chapter builds on the previous two chapters (Chapter 5 and 6) which examined documentary evidence in a bid to understand the institutionalisation of policy and reforms aimed at promoting systems integration, interoperability and information sharing. Chapter 5 discussed policy and legislation that promotes the integration and interoperability of e-government systems and information sharing to promote the digital transformation of government and smart governance. Chapter 6 discussed the Labour Market Intelligence/ Information Systems project, a practical case study of an e-government integration, interoperability and information sharing initiative. Project and related documents were the main sources of evidence in Chapter 6 for providing insights into the complexities of e-government integration, interoperability and information sharing. Documents were however not adequate in providing insights related to power relations, politics and intergovernmental

relations which are critical in understanding institutional barriers surrounding the digital transformation of government.

This chapter seeks to understand institutional barriers surrounding integration, interoperability and information sharing in government that are preventing the digital transformation of government. This chapter provides a basis for drawing conclusions and proposing recommendations in the next chapter. In understanding e-government integration, interoperability and information sharing issues in South Africa, Institutional Theory and the Circuits of Power Framework are used as frameworks of analysis.

Chapter 7 responds to the following **objectives** of this study:

- To **analyse** institutional barriers preventing the effective implementation of institutional mechanisms (regulative, cultural-cognitive and normative) aimed at institutionalising desired behaviour in the transformation of political and social institutions.
- To explore the institutional mechanisms implemented by goverments to promote integration, interoperability and information sharing in support of a digital transformation and smart governance agenda.
- To **analyse** and **explain** how Institutional Theory and the Circuits of Power Framework aids our understanding of the digital transformation of political and social institutions such as government.

In analysing the evidence, thematic content analysis is used (see Chapter 4 for a detailed discussion). Some of the main themes identified and discussed in this chapter include leadership and governance, power and politics, collaboration, trust, resourcing and information and communication infrastructure.

7.2 Leadership and governance

Political leadership plays an important role in the success of e-government integration, interoperability and information sharing initiatives. Evidence in this study suggests that leadership is perhaps one of the most important determining factors of success of digital transformation initiatives. Leadership influences change in institutions as they help in shaping the desired behaviour of actors, resourcing and developing supportive policies as discussed in the following sub-sections.

7.2.1 Top political leadership as champions of change in institutions

Political leadership in South Africa have been at the forefront of developing and implementing policy priorities. There appears to be a link between the commitment of top leadership and the successful adoption and implementation of policy directives aimed at promoting the digital transformation of government. In the digital transformation of government, leadership provides strategic direction and puts in place coercive such as policies and legislation that help shape desired behaviour in institutions among other things.

In the past two decades, political leadership in South Africa has played a significant role in the development and implementation of mechanisms such as policy and legislation to promote the digital transformation of government (see Chapter 5). In 1995, former President Thabo Mbeki led the development of the African ICT for Development agenda. As a sign of top political leadership commitment, former President Thabo Mbeki, then deputy President led the South African delegation to the World Summit on Information Society (WSIS) in 1995. During this period, not only were policies developed, but legislation and other institutional mechanisms aimed at promoting digital transformation were also implemented. The first ever e-government policy framework and the State Information Technology Agency, for example, were established and implemented during the previous administration led by President Thabo Mbeki.

Top political leadership also influences the transformation of cultural-cognitive and normative elements such as practices, beliefs, norms and value systems. In 1995, the South African government developed the White Paper on the Transformation of the Public Service which adopted the "Batho Pele" or "People first" principles aimed at shifting the focus of government to being "people-centric". The adoption of the principles came at a time when South Africa had just gained freedom from the apartheid regime which was infamous for the abuse of human rights.

After South Africa attained freedom in 1994, the broader aim of the socio-economic policy of the new government led by the late President Nelson Mandela and deputised by Thabo Mbeki was to establish a more equal society through reconstruction and development as well as strengthening democracy for all South Africans (South Africa History, 2017). Transforming the public service was identified as one of the key levers in building a more equal society (South Africa, 1995). The digital transformation agenda was also to a large extent influenced by these broader socio-economic goals. Here we see the influence of the socio-historic context in the adoption and implementation of regulative, cultural-cognitive and normative mechanisms aimed at transforming government.

In the past few years, poor leadership remains one of the most significant challenges that have compromised the digital transformation and smart governance agenda in South Africa despite some of the notable achievements such as the development of supportive policies. The development of policies alone is not adequate if these are not accompanied by measures to ensure their successful implementation. The President Zuma administration that succeeded President Thabo Mbeki's administration showed little support for the implementation of the

digital transformation agenda despite making significant progress in the development of policy during that period. For example, despite rapid developments in the digital society, it took more than 15 years for the South African government to publish a National E-strategy since the first ever e-government policy framework was published in 2001. This points to digital transformation reforms in government being at the early stages of institutionalisation (Habitualisation). Legitimate and political power held by top political leadership in the transformation of government is critical in influencing the transformation of government.

The policy and legislation framework (see Chapter 5) reiterate the importance of top political leadership in driving the smart and digital transformation agenda. The Public Services Administration Act of 2014 and the Corporate Governance of ICT Policy Framework of 2012 assigned the responsibility of leading the digital transformation agenda in the public sector to the political heads of government institutions. This is important for accountability. Lack of accountability by political leaders has promoted a culture of poor governance. For example, the former Minister of Finance, Pravin Gordhan, a key political figure who was responsible for the implementation of the Integrated Financial Management System, refused to take responsibility for its failure, blaming junior officials. According to ENCA News (2017), “former finance minister Pravin Gordhan rubbished claims that he should be liable for the Treasury's failure to manage the implementation of the Integrated Financial Management System. Gordhan stressed that the Treasury's Integrated Financial Management System is managed by officials and not ministers”. This is worrying as political heads are ultimately accountable for the successful implementation of government programmes and priorities.

Top political leadership support and the recognition of technology in government as an equally important resource is important in increasing the prioritisation of ICT as a strategic resource in governance.

Evidence collected in this study suggests that support for digital transformation from top political leadership remains low, despite policies and legislation recognising digital transformation as a national priority. There are however pockets of excellence. The Department of Home Affairs, despite some of its challenges, is one of the few government departments that have embraced digital transformation through its modernisation programme. The programme is aimed at improving service delivery and security through the digital transformation by rolling out smart initiatives (Department of Home Affairs, 2015). The integration and interoperability of systems with other government departments is also a key strategy in the digital transformation of the Department of Home Affairs.

The role of top political leadership in influencing digital transformation cannot be overemphasised. There was a general view by participants that digital transformation needs to be driven at the level of top political leadership in government e.g. by the President, Deputy President or so-called "senior ministers" such as the Minister in the Presidency responsible for Planning, Monitoring and Evaluation. Respondent 2 for example commented:

> "In South Africa, the top political leadership is prioritising certain issues other than ICT. ICT has become one of those nice to have things but is not at the top of the priority list. If we had top political leadership leading the digital transformation agenda, South Africa will be way ahead in leading the digital transformation agenda. Remember during the Thabo Mbeki administration, the

> Information Society Plan was led by the President and during that time South Africa was leading in e-government in Africa. Every government department and state agency supported the implementation of the plan because it was prioritised by top political leadership".

The notion of political leadership support as a key driver was reiterated by Respondent 4, an e-government expert who commented:

> "In one of the e-government projects that started under the leadership of [President] Thabo Mbeki, we made significant progress but lost momentum due to lack of top political leadership support from the current administration under President Zuma".

The leadership of the digital transformation agenda by top political leadership during the previous administration led by Thabo Mbeki was consistent with the recommendations of the 1998 Commission on the Transformation of the Public Service. The Commission had recommended that the digital transformation of government be led by top political leadership in the Department of the Presidency. It appears that digital transformation despite being identified as a priority in policies hasn't been given the same recognition in policy implementation. The success of digital transformation thus requires the political will of top leadership to lead the transformation. The top political leadership has legitimate and political power to influence the desired behaviour in complex institutions such as public institutions that are bureaucratic, rule-bound and political. In South Africa, the majority of government departments and public institutions are led by political heads appointed by the cabinet or

President to facilitate the development and implementation of policies that are in sync with government priorities.

7.2.2 Role of top political leadership in fostering social and political cohesion

Top political leadership has a role to play in fostering social and political cohesion in institutions during the process of transformation or institutionalisation of reforms. The extent of cohesion among social and political actors in institutions impacts their ability to successfully transform. The Sedimentation stage which is characterised by greater stability and wide adoption of rules, norms, belief system by actors in the institution is likely to be achieved when there is greater cohesiveness among various actors in institutions. Cohesiveness coupled with trust assists in institutionalising the desired behaviour in the transformation of institutions. According to Respondent 6: "Slow transformation in the integration of government is due to a lack of support and commitment from top political leadership which is the glue that holds things together". Respondent 4, an e-government expert with extensive experience in working in e-government projects also argued:

> "More often than not, once the leadership championing some of these initiatives loses interest or gets frustrated by the bureaucracies in government the projects crumble. I experienced this with one of the e-government projects I was involved in. The moment the leader gave up, an otherwise promising project just crumbled".

7.2.3 IT leadership and governance

IT leadership and governance are significant barriers confronting government in its digital transformation journey. The findings in this study were confirmed by the Auditor General (AG) report that concluded the lack of stability in the role of the Government Chief Information

Officer that has been vacant for more than six years "has had an impact on the timely finalisation and implementation of standards, guides and procedures to be issued to departments" (Auditor General, 2017:140:). Lack of leadership has consequently impacted on IT governance within government. According to the Auditor General (2017), most government departments are still struggling with the implementation of the Corporate Governance of Information and Communication Technology Policy Framework. In 2017, only 17% of the government national and provincial departments had adequate IT governance controls in place (Auditor General South Africa, 2017). The leadership crisis has been worsened by poor governance and leadership in structures such as SITA and GITOC that have been established to promote the management and governance of ICT as a strategic resource in the public sector.

Delays in implementation of policy and the failure by political principals to appoint a permanent Government Chief Information Officer is perhaps evidence of lack of political will. Leadership is critical if the digital transformation is to become a strategic focus area and national priority. Resourcing of digital transformation initiatives in government also remains poor. This is also a reflection of non-prioritisation by top political leadership in government responsible for setting up national priorities and policies and programmes.

7.2.4 Institutions as leaders of change or change agents

The significance of leadership extends beyond individuals leaders but institutions themselves, as centres of power that not only use their legitimate power but also coercive power (rewarding and punishing) and expert power to drive transformation. The Presidential Review Commission on the Transformation of the Public Service in 1998 identified the need for a "Lead Agency" to lead the digital transformation of government. In the same year, the State Information Technology Agency (SITA) was established through the State Information Technology Act of

1998 to drive the digital transformation and smart governance agenda. Key among SITA's role was to facilitate the integration and interoperability of e-government systems.

The State Information Technology Agency (SITA) has however suffered leadership and governance challenges since its establishment. In 2012, the then President of South Africa, President Jacob Zuma issued a proclamation mandating the Special Investigations Unit (SIU) to investigate allegations of corruption and maladministration at SITA. Leadership stability has been a cause for concern. SITA has had eighteen CEOs in its 19 years of existence (1999 – 2018), with only two of the eighteen completing their terms. Effective and stable leadership in institutions leading change is critical in empowering those institutions to institutionalise reforms. Instability in institutions leading change is consistent with the early stages of reforms (Habitualisation).

Poor leadership has not only resulted in reputational damage but also a loss of trust. Commenting on the role of SITA in digital transformation Respondent 4 argued "who takes SITA seriously? They have just been reduced to nothing more than procuring ICT services for government, they lack the integrity and no one takes them seriously". The loss of trust in institutions diminishes their legitimate power derived from their mandate and expert power normally derived from an institution's specialist expertise. This also compromises the ability of the institution to influence the desired behaviour through regulative and normative mechanisms.

When actors in institutions fail to use their power (legitimate, expert or political) in carrying out their mandates, they are likely going to lose that power in influencing change. The adoption of norms and standards developed by SITA has been slow which perhaps indicates that it has

lost its expert and legitimate power to drive the digital transformation of government. Loss of power can be attributed to factors such as loss of reputation, poor governance and poor leadership. In the absence of expert power, mimetic mechanisms often fail to influence the desired behaviour. This is a major blow as SITA currently holds little or no coercive power to influence digital transformation in government as it cannot reward or punish non-compliance. In the absence of coercive power, institutions thus require legitimate and expert power or other forms of power to effectively implement reforms.

Findings from the literature suggest that the control of information systems is often a source of power in institutions (Markus, 1983). This study found that the failure to recognise information systems or any other resource as a form of power may result in institutions or actors in institutions losing the power derived from controlling information systems or resources. SITA has failed to use as a source of power its role as an institution mandated to lead digital transformation in government.

Challenges in institutional leadership have been witnessed in various initiatives aimed at promoting the digital transformation and smart agenda. Despite recommendations to establish a lead department to drive digital transformation of the public sector by the Presidential Review Commission on the Transformation of the Public sector, there is still confusion as to who is leading the digital transformation agenda. This lack of clarity of roles between the key departments leading digital transformation such as the Department of Public Services and Administration, the Department of Telecommunications and Postal Services and the Department of Communications has increased the risk of lack of accountability, government department 'turf wars' and dysfunctional structures. Responding to a question on the

responsibility of the various government departments driving the smart and digital transformation agenda, Respondent 2 reiterated:

> "The inefficiencies are due to the lack of clear boundaries and responsibilities between the departments leading the digital transformation agenda. This has increased the risk of turf wars".

Deepening turf wars in policy development and implementation is an indication of poor institutional leadership. Strong leadership fosters social and political cohesion and trust. Lack of clarity of roles has also weakened the accountability of actors in institutions. This has also compromised the coordination of resources and institutional activities aimed at promoting the digital transformation agenda.

Other leadership structures established to support the smart and digital transformation agenda in government have had their fair share of challenges. For example, the Government Information Technology Officers Council (GITOC), established as a policy advisory council on matters of digital transformation among other things, has been criticised for falling short in its mandate. Commenting on the role of GITOC respondent 12 argued:

> "Some of the challenges we are facing regarding the interoperability of e-government systems is that GITOC is a dysfunctional structure. If GITOC was functional, it would have by now advised government on integration and interoperability issues".

Weak leadership structures have contributed to the poor implementation of institutional mechanisms meant to drive the transformation of government. For example, there is a poor adoption of normative mechanisms such as standards and norms meant to strengthen the integration and interoperability of government. Without effective institutional leadership structures to coordinate and monitor institutional mechanisms, such as norms and standards, the institutionalisation of reforms is less likely to succeed.

Regulative challenges, turf issues and power struggles have also been witnessed in the implementation of the National Broadband and Digital Migration Projects due to weak institutional leadership. Both projects are important in achieving government's vision of 100% broadband connectivity by 2020, a key project in achieving integration and digital transformation of society and government. The ongoing legal battle between the Department of Telecommunications and Postal Services and the Independent Communications Authority of South Africa, over the issue of the broadband spectrum is a significant example of ongoing power struggles. These weaknesses in institutional leadership have impacted the digital transformation agenda as evidenced by the delays in the implementation of policy among other issues. Some respondents, when asked to comment on the legal battles between some government departments and agencies, reserved their right not to comment as the issue was a politically sensitive matter which was also before the courts of law. Power and politics in institutions are discussed in the next sub-section.

7.3 Power, politics and institutions

Power and politics in institutions play an essential role in the institutionalisation of information systems (Silva & Backhouse, 2003). The success of systems integration initiatives and digital transformation reforms in government, therefore, require an understanding of the interplay between power, politics and inter-organisational relations in the institutionalisation of new

structures, systems and norms in public institutions. In South Africa, power and politics have been evident in the prioritisation and implementation of policies and programmes. The role of the so-called "super departments" such as the National Treasury and the Presidency in influencing the prioritisation of policies was confirmed by the majority of participants in this study. Commenting on the role of power and politics in policy implementation, Respondent 2 reiterated:

> "There are powerful ministries such as the Presidency and the National Treasury who influence the success of policies. National Treasury, for example, controls the national budget and when we develop policies from time to time, we negotiate with the treasury to convince them to see the value".

Respondent 4 also argued that the Presidency played an influential role as it had "the ear of the President". The Presidency derives its power from its legitimate authority as the driver of South Africa's development agenda as articulated in the National Development Plan. The National Treasury as a key actor in the transformation of government thus derives its power from its control of the national budget. This places emphasis on the resourcing of institutions as the key to the success of the digital transformation of institutions. Resourcing is discussed in some sections in this chapter.

7.3.1 Institutional actors, power and institutionalisation

The role of actors that hold some form of power in institutions deserves closer attention. Institutions as symbols of power are also influenced by their "actors" particularly those who hold some form of "power", whether legitimate or illegitimate. In the episodic circuit, for example, powerful actors influence behaviour by using not only coercive mechanisms but normative mechanisms to influence transformation in government. Actors such as top political

leadership in institutions driving the transformation agenda have played a significant role. In South Africa, top political leaders have played a significant role in the successful promulgation and implementation of regulative and normative mechanisms such as policies, legislation, standards, values systems and norms aimed at promoting the digital transformation of government. Commenting on the role of top political leadership in influencing the success of the smart and digital transformation agenda, Respondent 5 reiterated, "Government is about politics and politics is about power, you can't expect political light-weights to effectively influence policy transformation".

This study also revealed that actors in institutions are only as powerful as the institutions they are associated with (power by association). Institutions are sources of power and actors derive some of their power from institutions they are associated with. Powerful institutions being led by actors who have political or other forms of power (e.g. expert power) are likely to be more effective in the implementation of reforms for promoting the transformation of institutions. When less powerful political institutions are led by powerful political leaders they are also less likely to be effective in influencing change.

Evidence in this study revealed that there have been some examples where policies fail because the institution leading the implementation of that policy was weak despite being led by a powerful political actor. Institutions thus derive their power to influence change not just from the individual actors with legitimate or political power but the ability of those institutions to control resources, rules and other activities. A significant example is the National Treasury which controls the national budget. Despite changes of political heads leading the National Treasury, its power in controlling the national budget has always remained. This finding substantiates the claim that "political power is not distributed evenly in any political system"

(Ball, 1993:31). Access and control of resources are seen as playing a key role in the acquisition of power (Ball, 1993; Scott, 1987; Scott, 2014). According to Markus (1983:440), "position in the formal structure of the organization often provides greater access to specific power resources and the legitimacy required to use them".

In highly political institutions such as government, power and politics play a role in influencing how institutions transform. In the South African context, this study found that in government, individual actors in the majority of instances derive their power from the authority or legitimate power from holding a position of influence or power. On the other other hand, Zheng, Dawes and Pardo (2009:44), in their review of literature found that the majority of studies concluded that "leadership in the context of cross-boundary information sharing seemingly relies more on the use of personal power rather than on the position or legitimate power over the participants". This study found minimal use of personal power in the institutionalisation of reforms. This can be explained by that political and legitimate power is often associated with coercion consistent with early stages of institutionalisation. Personal power is more reliant on the traits of the leader and might not always be effective in the early stages of institutionalising reforms or where norms and value systems and culture are unsupportive of reforms.

Commenting on the role of power and politics in policy prioritisation, Respondent 4, an e-government expert who has been involved in e-government policy and projects noted that "To get things moving in government, a department needs to speak to the Minister in the Presidency who needs to speak to President who in turn then needs to speak to National Treasury. It is not the personal power that individuals hold but the power derived from institutions they control that is key to policy implementation. This is a notion that was reinforced by Respondent 5 who reiterated that "You see, there are powerful individuals in government but that alone is not

enough to influence policy direction. It's about the power that comes with an institution such as the Treasury or the Presidency". Here again, we see the role of institutional actors as power brokers in the transformation process. Political power broking has often been used to influence policy decisions and prioritisation of policies. On the dark side, it can perpetuate the circumvention of established norms, formal structures and systems in institutions that brings stability to institutions, therefore, risking destabilising institutions.

The ability to influence institutional mechanisms such as policy, legislation and other normative and cultural-cognitive mechanisms is also the source of power for actors or institutions positioned to influence such mechanisms. This study revealed that the current government run by the African National Congress (ANC) has managed to develop a national policy framework that aligns with its social, economic and political agenda at a political party level. This is best explained by the fact that the ANC led government enjoys the privileges and power of being the majority and therefore controls key institutions such as the Parliament that is responsible for promulgating and passing legislation. Government departments are also headed by political heads, predominantly from the ANC, to facilitate the implementation of such priorities. Policies and priorities that are promulgated by the African National Congress (ANC), South Africa's governing party at its policy conference, in the majority of cases, go on to become adopted as national policies and priorities. This is consistent with Scott's argument that "institutional theorists call attention to the truth that rules themselves are important types of resources and that those who can shape or influence them possess a valuable form of power" (Scott, 1987:508).

Since the dawn of South African democracy in 1994, the South African government has adopted socio-economic policies aimed at promoting socio-economic transformation. These

policies that have promised socio-economic prosperity have been popular with the majority of the historically socio-economic excluded citizens. This is despite increasing unrest and discontent surrounding the poor state of governance in South Africa and increasing inequality. The implementation of policies meant to promote socio-economic transformation remains slow. Some of these policies remain a source of power for the governing party. For example, about a third (17 million) of South Africa's estimated 51 million total population receive social grants as part of efforts to improve the standards of living and to redistribute the country's wealth to create a more equal society. This has led to the criticism of the current government, with critics arguing that this is turning South Africa into a welfare state. This again reflects the difficult role government has to play in balancing the different priorities. An understanding of South Africa's socio-economic context and socio-historic context is also critical in understanding some of the policy decisions. South Africa's history of inequality and social injustices explains some of its policy decisions which are aimed at redressing the injustices of the past.

Respondent 4 argued that the social grant system, the brainchild of the ANC led government, is a good example of policies that have played a significant role in ensuring that the governing party remains popular among the ordinary citizens. In reality, policies and programmes such as digital transformation are still considered a "nice to have" and not critical. This is despite the recognition of digital transformation as a catalyst for inclusive growth and development in the National Development Plan. Until we reach a point when the citizens recognise digital transformation as a catalyst for inclusive growth and development, initiatives aimed at promoting the digital transformation of government and society will be less likely to be given the recognition they deserve. Institutional reforms that do not appeal to the majority are less likely to translate to sources of power for institutions controlling them. Social obligation in this

instance is thus used as a basis for attaining legitimacy. This finding substantiates Scott, Ruef and Carmona's argument that "Organisations require more than material resources and technical information if they are to survive and thrive in their social environments. They also need social acceptability and credibility" (Scott, Ruef & Carmona, 2000:237). The increasing dependence of the State on other social actors is due to the State's lack of resources to deliver public service, or its lack of legitimacy or because it faces an environment which is increasingly becoming ungovernable (Pierre & Peters, 2000).

7.3.2 Power, politics, legitimacy and institutionalisation

The relationship between power, legitimacy and institutionalisation deserves some close attention. The issue of legitimacy has featured prominently in this study. Therefore, I raised the following question: **What is legitimacy in relationship to power, politics and institutionalisation?** To answer this question, I revisited the notion of legitimacy and how it is understood and applied in this study. The following key definitions influenced how legitimacy is understood and conceptualised in this study:

- Scott, Rueff and Suchman (2000:237) simply defined legitimacy as "social acceptability and credibility".
- Suchman (1995:574) defined legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions".
- Gordon, Kornberg and Clegg (2009:16) defined legitimacy as "...adherence to rationality, premised on bureaucratic rules of governance".

The first two definitions, for example, highlight the sociological perspective which emphasises social acceptability while the last definition reflects a power and political perspective where the emphasis is adherence to rules and governance. From the definitions above, I argue that

legitimacy is about the perception of institutions as socially acceptable or acting in a socially acceptable manner. It is also about their credibility and adherence to expected norms and rules of governance. This notion is keeping in line with the multidisciplinary approach adopted in this study which integrates the social perspective and political perspective in understanding phenomena.

The perceptions of institutions or their actions as legitimate or not are influenced by several factors, chief among them are the actions of actors associated with the institution. In this study, it was found that actors in institutions are a mirror through which the institution is reflected. Controversial decisions by political leadership, for example, have influenced the legitimacy of some public institutions in Some Africa. Allegations of poor governance and leadership in some public entities such as the State Information Technology Agency, for example, have tainted the legitimacy of such institutions in leading the digital transformation agenda in government.

7.3.3 Self-interest and populist agendas in policy implementation

Institutional theorists seem not to agree on what influences and shape the behaviour of actors in institutions. Scott (2014) believes institutions influence the actions of individual actors and define their interests. DiMaggio (1989), on the other hand, argued that institutional theory fails to consider self-interest behaviour in institutions by arguing that it "denies the reality of purposive, interest-driven behaviour" (DiMaggio, 1988:5). These schools of thought were tested in this study. In this study self-interest is defined as "political behaviour concerned with the goals of the individual, and not with organizational objectives, or with greater good" (Buchanan & Badham, 2008:12).

Evidence suggested that self-interest driven behaviour is a common phenomenon in public institutions in the South African context. Evidence collected also suggests that self-interest behaviour is more likely to occur during the early stages of institutionalisation of reforms that destabilise long-established norms, values systems and structures. Commenting on self-interests behaviour respondent 2 noted:

> "When it comes to the implementation of reforms some actors do not always put the national priorities first. Some are concerned with how such reforms will benefit them or their political career and ambitions".

Social and political cohesiveness is also visible weak at this stage due to mistrust and uncertainty. This observation is consistent with Strang and Sine's (2002:42) assertion that, "Where cognitive, normative and regulative supports are not well aligned; they provide resources that different actors can employ for different ends". I argue that the "different ends" may reflect self-interests that are not aligned to the norms and value systems of the institution. This breeds conflict and confusion as reiterated by Scott (2014). In South Africa, some degree of conflict and confusion has been observed in the digital transformation journey. This is evident in turf wars between government departments and other role players leading the digital transformation agenda.

Institutions define and shape the interests of actors in the advanced stages of institutionalisation characterised by a high degree of social cohesion, common beliefs and values systems where institutional norms are embedded in institutional structures and systems. Greater alignment of the three pillars is also more likely at this stage. When the pillars are aligned according to Scott

(2014:71), “the strength of their combined forces can be formidable”. This is critical to the success of transformational reforms.

Scott (2014:235) argued that “institutional change is affected by variations in internal organisational dynamics, the more that some subset of actors who have access to power are advantaged by change, the more rapidly the change will occur”. Policy implementation in South Africa has suffered in the face of self-interests, populist agenda and politicking.

Prioritisation of policy in some instances is driven by political ambition, self-interests and populism, which compromises the success of policy initiatives that are deemed insignificant for gaining political power. This is a notion reiterated by Respondent 4, an e-government expert who commented: “The challenge is that self-interests of political leadership influence the prioritisation of policy in South Africa”. For example, the former President of South Africa, Thabo Mbeki, during the delivery of the OR Tambo memorial lecture on the 28th of October 2017, also expressed concern about a growing culture of self-serving interests within the governing party, the ANC. He argued that “the historic value system of the ANC has become so corrupted that its replacement, that is unprincipled access to political power and the related corrupt self-enrichment has, in fact, become the norm within the ANC” (Huffington Post, 2017). He argued that this has become a norm which has spilt over to the government. Institutional mechanisms are thus bound to fail in the face of self-interest in those holding legitimate and political power. The role of institutional actors in the institutionalisation of reforms is also discussed in this chapter.

The study found that in the adoption and implementation of policy, politically motivated decisions in some instances supersede national interests. This reinforces the notion that politics

is often viewed as "evil" and driven by self-interest. Scott (2014) asserts that institutional change is likely to happen quickly if projected changes are likely to benefit the institutional actors with access to power. The digital transformation agenda, for example, is to a larger extent, not a populist policy as it is not an immediate priority for the majority citizens who still lack basic amenities such as decent housing, clean water, sanitation, electricity and decent jobs. Respondent 5 for example noted:

> "The challenge is that the political interests of those in power influence the prioritisation of policy in South Africa. The intentions of those in power are not always for the benefit of the citizen but their own selfish agenda".

Institutional mechanisms are thus bound to fail in the face of self-interest in those holding legitimate and political power. This is a setback in the South African government's vision of a digitally transformed government as part of promoting the vision of an inclusive digital society.

There are however some cases where politics has been used for "social good". There was a popular view from some respondents that the current ANC led government has prioritised certain policies which despite being labelled populists policies have benefited its citizens. This suggests that policy implementation thrives when the decision makers have a lot to benefit from the process. Citizens indirectly may benefit from such actions. The question one may raise is; **"**if politics is used for public good does then that mean politics is the necessary evil"? The broader aim of socio-economic policies adopted after South Africa gained its freedom in 1994, was to create an equal society through reforms aimed at promoting socio-economic transformation for strengthening democracy for all South Africans (South Africa History, 2014). The current government has often been accused of using the transformation, social

justice and equality agenda to gain political mileage. Whether this is a valid claim or not, this issue will not be explored as it falls outside of the scope of this study. However, one can argue that if the citizenry benefits from these populist agendas then politics cannot always be considered as "evil". Politics is not necessarily 'evil' but individuals often use it for their own selfish or evil gains.

7.3.4 The three pillars of institutions and circuits of power in institutionalisation

Institutional Theory explains how institutions can shape the desired behaviour through the three pillars of institutions: (i) regulative, (ii) normative and (iii) cultural-cognitive pillar. The regulative pillar, for example, uses rules, rewards and punishment to influence the desired behaviour during the transformation of institutions. Legal sanctioning is, therefore, the basis of legitimacy. Because rules, laws, policies and other coercive mechanisms shape behaviour, institutional transformation calls for the need to realign the regulative pillar with the desired future state of institutions. In the episodic circuit of power, coercive power in this instance plays an important role in enforcing discipline and compliance. In this study, I found that the regulative pillar is most effective when coercive mechanisms, coupled with the power to discipline non-compliance, are applied. The use of coercion and discipline is also consistent with the early stages of institutionalisation of reforms where established norms, value systems and beliefs may be hostile to new reforms.

The episodic circuit is also consistent with the regulative pillar where institutions use coercive power to shape the desired behaviour. In this pillar, the circuit of systematic integration was found to be more evident due to the need to facilitate change during the institutionalisation of new systems and structures as coercive mechanisms may not always be effective in facilitating change. I also found that referent power was also key in facilitating new changes in the circuit of systematic integration. Leadership in this pillar not only uses coercive, legitimate or reward

power but also play a facilitative role by using referent power in influencing the desired behaviour during the transformation or institutionalisation process.

The normative pillar places emphasis on "normative rules that introduce a prescriptive, evaluative, and obligatory dimension into social life" (Scott, 2014, 66). Legitimacy, in this case, is morally governed. The normative pillar places much emphasis on institutions as social systems and institutionalisation as social structures. It reinforces that norms, values systems and belief systems are part of institutions and help shape desired behaviour. In the transformation of institutions long established norms, value systems and beliefs can therefore promote or be a barrier to institutional transformation. As part of the institutionalisation of reforms, changing established norms and value systems (deinstitutionalisation of established routines), as difficult as it might be, is critical in helping shape desired behaviour. In this study, some of the long-established norms and value systems in public institutions were found to be a significant barrier to the digital transformation of government. The normative pillar, therefore, has a significant impact in the institutionalisation process. Shared norms and values systems often lead to greater social cohesion which is critical during the institutionalisation process as it leads to less resistance and conflicting views which may fuel delays in institutionalisation. The social integration circuit which pays much attention to dispositional power was clearly evident in the normative pillar in institutions.

The cultural-cognitive pillar is centred "on the role played by the socially mediated construction of a common framework of meanings" (Scott, 2014:70). Its emphasis on the common understanding of shared beliefs and shared logic of action (Scott, 2014) is critical in the objectification process that results in greater cohesiveness in institutions. This establishes a basis for the creation of shared beliefs and common understanding during the sedimentation

process in institutionalisation. This is critical for stabilising structures and systems in institutions during their transformation. I also argue that the need to use coercive power and discipline at this stage is minimal as norms and value systems that shape desired behaviour are embedded in the social system. In this study, the circuit of social integration was found to be more pronounced in the cultural-cognitive and normative pillars which places emphasis "on the role played by the socially mediated construction of a common framework of meanings" (Scott, 2014:70).

7.4 Trust

7.4.1 Fostering trust in institutions for engagement and participation

The digital transformation of government requires integration, interoperability and information sharing across government agencies. Integration, interoperability and information sharing, however, cannot be achieved without trust between government departments. In Chapter 2 I discussed several factors from the literature that have given rise to mistrust. These factors are highlighted in Table 22. After analysing evidence coming through from documents and interviews, Table 22 highlights factors affecting trust identified in this study.

Table 22: Factors affecting trust in integration, interoperability and information sharing		
Factors	**Identified in Literature (see Chapter 2)**	**Identified in this study**
COERCIVE		
Legal issues surrounding the sharing of personal data and information	X	X
Power and Politics in institutions in the sharing of data.	X	X
Conflicting mandates/ priorities		X
NORMATIVE		
Reputational damage resulting from sharing poor quality data	X	X
Quality concerns surrounding the shared data or information	X	X
Being open to public scrutiny when data and information relating to government affairs is shared	X	X
MIMETIC		
Economics of Information (driven by the desire to survive) information as a source of economic power	X	X
Loss of autonomy when systems, data and information are integrated	X	X

Contrary to evidence from the literature that suggested that trust was a major barrier in e-government integration and interoperability, evidence in this study suggested that trust among government departments was not a major constraint in the South African context. Few participants identified trust among the government departments as a cause for concern. Trust concerns were identified between the government and actors outside of the government such as citizens, civil society and private business as shall be discussed below. Trust issues were as a result of factors that had nothing to do with digital the transformation of government but the general socio-economic and political context.

Citizens, for example, did not trust some initiatives aimed at promoting the digital and smart agenda not because of their mistrust of technology and other developments but because of their mistrust of government as an institution (institution-based trust). Commenting on the issue, Respondent 5 noted:

> "The challenge we face as the government in implementing some of our programmes is the mistrust of our government by citizens, not the programme being implemented".

Mistrust of government impacts participation, a key outcome of smart governance. In the absence of trusting relations, initiatives aimed at promoting the transformation of institutions are likely going to fail. This is as a result of its impact on the political culture defined as, "attitudes to the political institutions of the state, and the degree to which citizens feel they can influence and participate in the decision-making process" (Ball, 1993:62). Here again, political leadership has an important role to play in fostering trust in institutions during transformation.

Commenting on the issue of trust among government departments Respondent 5 argued that government departments were inter-dependent and cannot afford not to trust each other. This view was substantiated by Respondent 13 who noted that trust among government departments was the least of their concern when it came to integration, interoperability and information sharing. Other views suggested that trust was more pronounced in departments that share a similar mandate and not across all government departments. Respondent 3 argued that trust was more likely be a concern for departments that are not in the same cluster and less likely for those in the same cluster. The concern emanates from the fears around how the actions of the other department may infringe on their mandate as a result of competing mandates.

Trust concerns were more pronounced between the government and other actors such as the private sector, civil society and citizens. This is problematic as partnerships are critical in driving the digital transformation agenda due to capacity issues. The public sector often does not have the capacity or capability to develop tools and technologies required to drive digital transformation. This has resulted in an over-dependence on the private sector to provide the tools, technology and capability. A significant example is the e-Home Affairs initiative where the Department of Home Affairs has partnered with some of South Africa's major banks to assist in the provision of services such as the capturing of applications for the new smart identity cards. The partnership is based on the recognition that Banks have the infrastructure capability such as biometric information capturing technology. The e-Home Affairs project is a significant example of how trusting relations are critical in the digital transformation journey.

In the process of building such relationships, mistrust has been evidenced in some instances especially where the government is conducting business with the private sector. The comments below shed some light:

> "There is mistrust is between the private sector and public sector, especially where the procurement of systems or technology is concerned. The private sector chases profit and monopolies. These projects are cash cows for the private sector. Price fixing, collusion and monopolistic behaviour by the private sector have resulted in the government not trusting the intentions of the private sector when it comes to assisting the government with these projects. I think trust is important in ensuring the success of such initiatives" (Respondent 6).

Citing an example of the Integrated Health Management System, Respondent 6 noted that; “In one institution one will find different entities using different systems which at times make integration challenging. In the majority of the cases, the service providers are driven by making profits”.

Respondent 4, an e-government also weighed in on the issue of mistrust between government and private business and commented:

> “The private sector is happy in keeping the status quo due to fear that if systems and services are integrated a lot of these companies providing various fragmented systems and services might lose contracts. In the implementation of the National Broadband Strategy private business was not happy over the spectrum issue as they feared they will lose a lot”.

This comment reflects the extent to which self-interests, not just within political institutions such as government, but other actors such as private business have compromised the digital transformation of government. Failure to act in the interests of the public by actors outside of the government is arguably one of the reasons for the growing mistrust between government and other role actors in the digital transformation of government.

Moreover, private interests sometimes supersede national interests, especially where corrupt, monopolistic and cabalist intentions are a norm. Mistrust between actors inside and outside of government is a constraint in the digital transformation agenda. South Africa is also undergoing some trying times in the history of its democracy due to the degenerating socio-economic situation which has been exacerbated by corruption, self-serving interest, maladministration and poor governance in state institutions. The Public Protector State of Capture report released

in August 2016 and various other reports by civil society and academics unearthing corruption, poor governance and allegations of "state capture" have added to the mistrust.

7.5 Social and political cohesion

Social and political cohesion was also found to influence integration, interoperability and information sharing as it is the glue that holds inter-organisational relations. The lack of social and political cohesion is a barrier in the development and implementation of policies. The successful development and implementation of regulative mechanisms such as policies require the collaboration of various actors. The South African government often finds itself at odds with other actors such as private business, civil society, citizens and other social partners due to weak social cohesion. This may suggest that the full institutionalisation or sedimentation of 'smart governance' is yet to be reached. Smart governance is often characterised by strongly established structures, norms, value systems, practices and trusting relations. Here again, we note that institutionalisation of reforms is not only influenced by internal pressure within institutions but isomorphic pressure from the external environment.

Weak political cohesion was observed in the implementation of the Digital Migration project in South Africa. The Minister of Telecommunications and Postal Services, some cabinet ministers and the African National Congress (ANC), the governing political party were not happy with the lack of consultation by the Minister of Communications in the implementation of the project and decision making (Daily Maverick, 2015). This is clear evidence of weak political cohesion and poor integrated planning within the government.

Coercive mechanisms such as policies and legislation often fail when social and political cohesion is poor in institutions as this weakness collaboration. In South Africa, growing mistrust of the government by citizens and other actors outside of the government has

weakened social and political cohesion. Institution-based trust is discussed in the previous sub-section. The implementation of the smart governance and digital transformation agenda in South Africa has been compromised by poor cohesion.

The implementation of the electronic road tolling (e-tolling) project in the Gauteng province, South Africa's economic hub, is a significant example of how weak social and political cohesion can lead to failure of digital transformation initiatives. The Gauteng e-tolling system, launched in 2013 to fund the Gauteng Province Freeway Improvement project, was followed by widespread resistance by citizens, civil society and opposition political parties due to poor consultations in its implementation. Growing public resistance and non-compliance pressured the Gauteng Premier to establish a panel to investigate the "socio-economic impact of the project". The Panel concluded that "the opposition to e-tolling has taken place in a heightened political climate accompanied by a massive civil disobedience campaign" (Gauteng Provincial Government, 2014:16). The panel also noted that "the widespread civil disobedience sets unsustainable precedents and threatens democracy and social cohesion" (Gauteng Provincial Government, 2014:16). This came a little too late as the damage had already been done. Five years after the implementation of the e-tolls, delivering the State of the Province Address on the 26th of February 2018, the Premier of Gauteng Province admitted that the e-tolling project had failed due to resistance.

Commenting on the failure of the e-toll project in implementation, Respondent 5 noted that "the e-toll project is a significant example of citizen's mistrust of the government as they viewed the initiative as another project to benefit the political elite". The e-tolling project was therefore "a missed opportunity to introduce t-government [transformational government] to enhance the sustainability of an ICT project through participatory principles" (Mawela, Ochara

& Twinomurinzi, 2016:16). Again we see that reforms aimed at promoting digital transformation cannot be realised without collaboration between key actors such as government departments, civil society, citizens and political institutions. Without social and political cohesion and trusting relations "Objectification" or "Sedimentation" of reforms is often difficult to achieve. Leadership plays a role in fostering political and social cohesion as discussed in the leadership sub-section earlier. The Premier of the Gauteng Province, David Makhura delivering his 2018 State of the Province Address noted that he will engage the newly elected President Ramaphosa in order to find a sustainable solution (Gauteng Provincial Government, 2018). This highlights the importance of top political leadership commitment in the implementation of digital transformation projects.

Departmental turf wars are also a clear sign of lack of cohesiveness among institutions and actors driving the digital transformation agenda. Several participants weighed in on the issue of turf wars in government. Some comments are highlighted below:

Respondent 1 reiterated that no significant progress has been made in the implementation of policy due to "turf wars that have detracted government departments from focusing on common goals and national priorities". Commenting on a similar issue, Respondent 9 argued that in implementing programmes, government departments often avoid reporting on transversal mandates to avoid turf wars.

A lack of cohesiveness was found to be more apparent in departments that are not in the same cluster due to the increased likelihood of "competing mandates". An example of competing mandates was the policy around securing borders through stringent visa regulation (security) versus relaxing visa regulations to attract tourism (economic growth). Lack of social and

political cohesion also increases the likelihood of fragmented planning and poor implementation which emerged as a barrier to achieving an integrated government.

7.6 Support structures

In this section, I discuss the institutional support structures implemented by the South African government to address barriers to government integration, interoperability and information sharing. Regulative mechanisms such as policies, legislation and frameworks, for example, play an important role in promoting the integration and interoperability of systems across government (Pardo, Nam & Burke, 2012). These are however compromised by the absence of support structures for their institutionalisation. The South African government has developed policies, frameworks and legislation aimed at promoting the integration and interoperability of systems, and information sharing in government. The legal and policy framework promoting the integration of government is discussed in Chapter 5. Several normative mechanisms such as standards and norms have also been established to promote collaboration, integration and cross-boundary information sharing. Without structures to support these mechanisms, their institutionalisation may remain a challenge. Below we discuss some of the structures implemented to support the digital transformation agenda.

7.6.1 Government clusters

The government cluster system was identified by the majority of participants as one of the structures that have been put in place to strengthen collaboration, cross-boundary information sharing, integration and interoperability. Clusters are structures that group related government departments and were established to "foster an integrated approach to governance that is aimed at improving government planning, decision making and service delivery. The main objective is to ensure proper **coordination** of all government programmes at national and provincial levels" (South Africa, 2018:1). The cluster approach is a mechanism for addressing the

fragmented approach to policy development and implementation which has weakened effective policy implementation and governance in South Africa. They play an important role in fostering political and social cohesion among government departments.

There are seven clusters which include:

- Infrastructure Development Cluster
- Economic Sectors and Employment Cluster
- Governance and Administration Cluster
- Human Development Cluster
- Social Protection and Community Development Cluster
- International Cooperation, Trade and Security Cluster
- Justice, Crime Prevention and Security Cluster

Clusters play an important role in ensuring the alignment of government-wide priorities, monitoring the implementation of priorities and providing a consultative platform on cross-cutting priorities (South Africa, 2018). Despite some achievements highlighted by the majority of participants such as improving coordination among departments sharing the same mandate within a cluster, the cluster approach still falls short in addressing policy coordination across clusters. Digital transformation, for example, cuts across several clusters such as the Governance and Administration cluster, Economic Sectors, Employment and Infrastructure Development, and Justice, Crime Prevention and Security cluster. From evidence collected in this study, the coordination of the digital transformation programme is facing several challenges such as turf wars, duplication of effort and lack of clarity on roles.

The challenge of competing and conflicting mandates and priorities as an impediment in collaboration and integration was emphasized by Respondent 5 who noted that departments and clusters at times seem to be at loggerheads because of clashing priorities and competing mandates. Citing an example of the clashes between the Department of Home Affairs and the Department of Tourism in 2014 over the new Visa regulations respondent 5 argued:

> "In implementing the new visa regulations, the Department of Home Affairs which belongs to the Justice, Crime Prevention and Security cluster was more concerned about securing our national borders. On the other hand department of Tourism which is part of the Economic, Employment and Infrastructure Development cluster was opposed to the new visa regulations arguing that they were impacting tourism, a key contributor to the country's Gross Domestic Product (GDP)".

Poor integration at policy planning and development is one of the reasons why the implementation of policy is often challenging. The weaknesses in supporting structures responsible for coordinating policy development and implementation are partly to blame for the challenges in policy implementation. This impacts the success of integration, interoperability and information sharing initiatives across government aimed at improving operations, governance and service delivery for the benefit of the citizenry.

7.6.2 The Government Information Technology Officers Council (GITOC) and the State Information Technology Agency (SITA)

The Government Information Technology Officers Council (GITOC) is a key actor in the development and implementation of mechanisms such as policies aimed at promoting the digital transformation of government. GITOC provides ICT policy advisory to the South Africa

government in support of the digital transformation agenda. The effectiveness of GITOC as a supporting structure in the digital transformation of government has however been questioned. GITOC was found to be an ineffective structure due to various factors such as weak leadership and lack of strategic acumen (Nengovhela, 2012). Evidence from this study echoed the same sentiments pointing to the ineffectiveness of GITOC in carrying out its mandate of supporting ICT policy development and implementation in government. Commenting on the role of GITOC as a structure for collaboration, exchanging ideas, information and knowledge to promote effective coordination and policy implementation, Respondent 6 argued:

> "GITOC has failed in its mandate of supporting government departments in the implementation of e-government policy. They lack direction and expect to be guided whilst in actual fact, they are the experts".

The comment points to a failure by GITOC to take responsibility for supporting the development of relevant policy for supporting the digital transformation agenda. The failure of structures such as GITOC in leading digital transformation in government was reinforced by Respondent 12 who commented:

> "GITOC needs to play a more prominent role in driving e-government integration and interoperability. GITOC needs to be accountable when it comes to the implementation of e-government. It is currently not fulfilling its mandate".

Dysfunctional structures have contributed to the failure of institutional mechanisms in addressing some of the concerns surrounding digital transformation initiatives. Structures such

as GITOC and SITA are dysfunctional and have failed to lead in coordinating resources, activities, accounting and taking responsibility in driving the digital transformation agenda to promote smart governance. Support structures play an important role in the transformation of institutions by providing stability to institutions especially in times of uncertainty. Speaking during the 2018 Budget speech of the Department of Telecommunications and Postal Services, Dr Siyabonga Cwele noted that cabinet had approved a framework for "repurposing and repositioning of SITA to provide services to the government in a reliable, efficient and cost-effective manner. The transformation of SITA includes rooting out corruption in the procurement environment" (Department of Telecommunications and Postal Services, 2018).

7.6.3 Intergovernmental Relations Directorates

The intergovernmental relations Act of 2005 prescribed the establishment of intergovernmental relations directorates within government departments to deal with intergovernmental relations across the different spheres of government in a bid to improve cooperation and dispute resolution. According to Respondent 5, Intergovernmental relations directorates are "meant to facilitate some kind of seamless integration in the three spheres of government". The role of the intergovernmental relations directorates in fostering collaboration was also confirmed by other participants in the study. Despite the establishment of the intergovernmental relations directorates within various government departments, problems still exist. This is evidenced by conflicting policy positions among government departments. Respondent 5 for example commented:

> "We have witnessed government entities taking each other to court over policy positions. This gives the impression that there is fragmentation when it comes to policy implementation".

The comment above clearly signifies weak social and political cohesion despite the existence of the intergovernmental relations directorates within the South African government. Supporting structures alone are not adequate if not supported by cultural-cognitive and normative elements such as value systems, belief systems and norms that foster collaboration, strengthen inter-organisational relations and trust in government.

7.7 Norms and Standards

7.7.1 Batho Pele principles "People first"

In 1997, as a direct outcome of the White Paper on the Transformation of The Public Service, the South African government introduced the Batho Pele Principles to promote the improvement of service quality and accessibility of government services and accountability to citizens. The following eight principles were adopted by the South African government to promote service excellence:

1. Consultation of stakeholders on the nature, quality and quantity of services to be provided
2. Promoting equal access to services for the citizens
3. Service standards that should be expected by stakeholder
4. Treating citizens with courtesy and consideration
5. Ensuring that citizens are informed
6. Openness and transparency in the running of government entities
7. Redress to address citizen complains
8. Value for money in the provision of services to citizens

The eight principles are meant to guide the implementation of services and programmes in government. The extent to which these principles have been institutionalised as norms in the public sector still remains unclear. Evidence collected in this study highlighted a gap between

the Batho Pele principles and the "reality" of the situation in public institutions. Issues of lack of a service excellence culture, fragmentation of government, self-interests and power and politics discussed in earlier sections signal that government is not living up to these principles. This has led to mistrust of public institutions. The institutionalisation of desired norms and systems in institutions extends beyond written catchphrases and mottos, it's about 'living' the principles through influencing a change in behaviour.

Again, the role of leadership needs to be emphasised. Commenting on the non-adoption of the Batho Pele principles, Respondent 11 reiterated that "If there is no leadership, the institution becomes dysfunctional". Political leadership in South Africa has increasingly faced criticism from civil society, private business and citizens for being at the forefront of corruption and departing from the Batho Pele principles which stress the need to put people first. The Betrayal of the Promise report by South African academics suggested that state institutions were being repurposed to serve the private accumulation of wealth and interests of a small powerful elite at the expense of the citizens (Bhorat et al., 2016). The State of Capture report also painted a gloomy picture of the level of corruption and undue influence of the elite in the running of the state (Public Protector South Africa, 2016).

There is a symbiotic relationship between the normative and regulative pillars. The study found that formal standards are poorly institutionalised when they are not supported by coercive mechanisms such as legislation and policies. Respondent 6 commented:

> "One of the most significant challenges we face as a department is the poor adoption of norms and standards. Our role is to develop standards and not to enforce their implementation as we have no legal mandate to do that".

This is a notion was reiterated by Respondent 2 who commented:

> "The challenge we face with the implementation of these frameworks or standards is due to the fact that we don't control the implementation. There is also no legislation that enforces compliance by government departments hence things fall flat when it comes to implementation".

These findings are consistent with Scott's assertion that "rules and norms, if they are to be effective, must be backed with sanctioning power, and cultural beliefs ..." Scott (2014:58). The role of cultural cognitive elements and their role in institutionalising norms are discussed next.

The cultural-cognitive elements that have shaped behaviour in public institutions have also influenced the adoption of norms and standards aimed at promoting the digital transformation of government. Commenting on the issue, Respondent 9 argued that institutions resist some initiatives on the basis that they have always done things in a certain way. As a result, new standards and norms are often adopted with scepticism. This notion was emphasised by Respondent 11 who argued:

> "Despite adopting the "Batho Pele" (People first) principles that speak to service standards, access to information and openness and transparency among other things, some government entities don't live by those values. The culture in government has made it difficult to live those values or principles".

Long-established norms and culture in institutions remain the most challenging to transform as these are deep-rooted within institutional structures, systems, practices and routines. The institutionalisation of reforms that promote the digital transformation of government might require the deinstitutionalisation of those long-established routines and practices that are hostile to reforms.

Institutional structures play an important role in the transformation of institutions or the institutionalisation of new reforms. The bureaucracy in government has often been blamed for slow transformation. The lengthy process involved in the development and implementation of formal rules, norms and standards is due to the multi-layers involved in the process. Commenting on the issue, Respondent 7 noted that "bureaucracy in government stifles innovation and transformation due to the tedious process in the implementation of change". Evidence gathered also suggests that the development, approval and implementation of policies, frameworks and standards is often a lengthy process. The process involves consultation with inter-ministerial committees, the Cabinet, clusters, Director General Forums and the general public through calls for public comment. This has slowed the implementation of change or transformation due to the complex processes. The consultative process is necessary for institutions such as the government whose success is driven by the participation of role players such as citizens, social partners and the business sector. A poor consultative process often leads to resistance as evident in the e-tolling project discussed in previous sections. Evidence in this study, however, suggested that delays were not always as a result of the consultative process but due to incompetence, funding challenges, poor capacity and leadership.

7.7.2 Technical standards

The South African government has developed technical standards such as the as Minimum Interoperability Standard (MIOS), Minimum Information Security Standard (MISS) and Government Widen Enterprise Architecture (GWEA) to address integration, interoperability and information sharing challenges. Section 97. (1) of Chapter 6 of the Public Service Regulations of 2016, for example, prescribes the following; "The Minister shall issue Minimum Interoperability Standards (herein referred to as the "MIOS") for the public service. (2) The MIOS shall include provision for standards and specifications for—

(a*)* Interconnectivity;

(b) Data **integration**; and

(c)Information access" (Department of Public Services & Administration, 2016:97).

Despite some of the pronouncements in legislation and regulations, the new Minimum Interoperability Standards are still yet to be issued by the Minister of Public Services and Administration. Continued delays in the issuing of these standards will promote continued non-compliance this is despite the responsibility being given to top political leadership in government. These delays indicate lack of prioritisation as well as poor commitment from top political leadership. With little or no consequences for top political leadership for failing to act on legislative and regulative directives, the implementation of normative mechanisms in government will remain a challenge.

The Minimum Information Security Standards (MISS) which were initially included in the Public Services Regulations of 2016 have since been excluded "as they remain contested, as they are believed to fall under the minister of Security" (Auditor General South Africa,

2017:140). This also reflects the extent of fragmentation and turf issues in the development and implementation of mechanisms for transforming government. This corroborates findings from interview discussions that revealed that government departments often avoid reporting transversal mandates to avoid turf wars. This is likely going to lead to poor coordination and implementation of these standards in the public sector leaving South Africa more vulnerable. Information security for example still remains one of the weakest areas in the public sector (Auditor General South Africa, 2017).

The adoption of enterprise architecture to improve efficiency and service delivery is increasingly recognised by governments the world over as best practice (Janssen & Hjort-Madsen, 2007). The South African government has also developed a Government-Wide Enterprise Architecture Framework (GWEA) published by the Department of Public Services and Administration in 2009 to address some of the challenges e-government. The Government-Wide Enterprise Framework is modelled around best practices and international standards in enterprise architecture as The Open Group Architecture Framework **(**TOGAF) and Information Technology Infrastructure Library (ITIL). This is a significant example of the role of mimetic isomorphism in influencing the transformation of institutions. Institutions adopt technology due to mimetic pressure to follow best practice and latest trends (Bjorck, 2004, Zheng, Chen, Huang and Zhang, 2013).

The Government-Wide Enterprise Architecture Framework (GWEA) was developed to address challenges that include:

- **Inconsistent** and **non-standard** planning frameworks.
- Government unable to **integrate services**.

- Challenges for SITA and DPSA to certify plans using a **consistent** and government-wide accepted framework.
- Costly systems development and rampant **duplication**.
- Low **organizational maturity** and stagnant service improvement (SITA, 2009)

Standardisation, cost reduction and integration of services are some of the benefits of Government Enterprise Architecture identified in the literature. A study on Enterprise Architecture challenges, for example, concluded that "By identifying, structuring and categorizing these elements, EA can increase the potential for cross-public sector reuse and reduce duplication and hence reduce costs" (Isomäki & Liimatainen, 2007:365).

The Government-Wide Enterprise Architecture Framework is therefore important in strengthening integration, interoperability and information sharing by prescribing minimum standards to inform the development of a blueprint for the development of ICT in the public sector. Enterprise Architecture in the public sector has been used "to manage process changes and ensure systems integration…to help align their strategies with business processes" (Weerakkody, Janssen & Hjort-Madsen, 2008: 2199).

The state of implementation of the Government-Wide Enterprise Architecture is still unknown but evidence from data collected suggested that adoption is still slower than desired. Respondent 12 cited legacy infrastructure, failure by departments to operate at a strategic level and poor monitoring of implementation at the government department level as some of the challenges. Monitoring and evaluation of compliance by the Department of Public Services and Administration and by the Department of Planning, Monitoring and Evaluation also remain inadequate due to capacity issues among other things. Respondent 6 noted that "despite the government having adopted a good enterprise architecture framework modelled around

industry standards, its value will not be realised if underlying issues are not addressed". Mimetic elements or so-called 'best practices' may fail to improve systems or processes if not supported by institutional reforms. This is true for complex institutions such as governments that are rigid, slow to adopt change and innovation and have long established norms and behaviour that are often challenging to deinstitutionalise.

The Government-Wide Enterprise Architecture framework is an IT framework that aims to address technical challenges such as interoperability. It fails to address some of the institutional challenges inherent in the digital transformation of government. This confirms observation from earlier research by Ross (2003) and Janssen and Hjort-Madsen(2007) that enterprise frameworks are technology focused and do not take into consideration the role of institutions in promoting the governance, adoption and diffusion of enterprise architecture. Long established institutional norms, practices can impact the institutionalisation of so-called 'best practices' such as enterprise architecture for addressing integration and interoperability challenges to promote the digital transformation of institutions.

The institutionalisation of new norms and standards are also likely to be resisted in institutions if they are seen to be taking away power from institutions and their actors. Despite the fact that SITA has had leadership and governance challenges, some of its failure to institutionalise new norms and standards can be attributed to the fact that it is perceived as a threat in taking away the control of resources and the decision making power from government departments. Respondent 3, for example, commented, "the problem is that SITA is trying to take away some of the functions from departments and this has not gone down well with departments". Respondent 4 also noted "Some government departments often bypass SITA when it comes to certain decisions some that require the input of SITA". Technology is increasingly becoming

a source of power for institutions and particularly actors controlling the technology. Some government departments and actors have expressed dissatisfaction over this move due to the fear of loss of autonomy and their significance in the digital transformation agenda. In this case, it's not the perceived threats digital transformation is likely to bring but the perceived threats associated with the loss of power brought by the transformation.

7.8 Resourcing

Resourcing is critical in the transformation of institutions. Scott (2014) citing earlier work of sociological theorists such as Giddens (1984) and Sewell (1992) highlighted the importance of material and human resources in the conception of social structures so as to take into account "asymmetries of power". Political activity in institutions may arise due to the scarcity of resources (Ball, 1993). Leadership, as discussed in earlier sub-sections, plays an important role in ensuring that institutions are adequately resourced to drive change. The poor resourcing of public institutions in South Africa has been blamed for their slow transformation. In discussing the issue of prioritisation of the digital transformation agenda, Respondent 4 had this to say; "Of course policy says it's a priority. Do you think what is happening on the ground reflects what is written in policy? The answer is no. Resources are being channelled to other priorities such as social development". Political activity according to Ball (1993:23), thus "results from the necessity of choosing and coming to a decision about alternative policies when only one is economically possible".

7.8.1 Resourcing: funding

Funding for initiatives aimed at strengthening digital transformation is critical for the success of such initiatives. Discussing the issue of the implementation of the National Broadband Strategy (SA Connect), a key initiative in the integration of government in promoting the digital transformation of government, Respondent 2 commented:

“At the end of the day, it’s about convincing National Treasury to see the value in some of these initiatives. Without funding any programme or policy is bound to fail”.

Commenting on the same issue, Respondent 5 reiterated:

> “Every department complains about the National Treasury, when it comes to funding it’s about competing for limited resources, and competing interests and mandates”.

Respondent 4, an e-government expert who has worked in multiple e-government projects also reiterated:

> “I think one of the challenges is that to implement a project you need to have a budget, implementation is challenging if a budget is not assigned. Budgeting is key for the resourcing of programmes for implementing policies. To get funding from the government, it can take up to three-year planning cycles to convince National Treasury to buy in”.

Some participants suggested that financial resources were available but the challenge was poor governance. Respondent 9 commented:

> “We have the financial resources; the problem is that we waste resources. There is a lot of duplication of effort in government and an inefficient allocation and deployment of resources”.

Echoing the same sentiment but focusing on the prioritisation of resources in government, Respondent 4, an expert in e-government reiterated:

> "Government has the funds, it's just that a significant portion is being allocated to social services, it doesn't make sense to have 17 million (one-third of the total population) relying on social grants. It's an issue of political interests when it comes to the prioritisation of programmes".

Although the issue of political interests in the prioritisation of policy cannot be disputed, South Africa's socio-historic context and current socio-economic context has influenced policy direction. The high unemployment rate of approximately 27% and the inequalities created by the apartheid regime that excluded the majority from the mainstream economy and poor governance is largely responsible for the current socio-economic crisis. The South African government often finds itself doing the balancing act between implementing social development programmes and economic development programmes such as digital transformation.

The 2017 Auditor General report also confirmed findings of this study that poor implementation of digital transformation programmes and modernisation of ICT infrastructure in government was as a result of poor funding among other things.

7.8.2 Resourcing: skills

Skills are important in driving digital transformation. South Africa is confronted by a perennial shortage of high-end skills. The comments below highlight the extent of the problem:

> "Skills are a challenge in the public sector as there is an over-reliance on consultants. Despite emphasis from the government that contracts awarded to consultants should have a skills transfer clause, skills transfer rarely takes place" (Respondent 3).

Respondent 6 also argued that the skills issue wasn't about the technical skills in government departments as the belief was that there were enough skilled and capable people in government. The issue was that technical people who lacked the relevant managerial and leadership skills were appointed to managerial and leadership positions. Technical capability does not always automatically translate to excellent management and leadership skills.

Some of the issues confronting government such as poor coordination, poor planning and management of resources were as a result of poor management and leadership skills. This notion was substantiated by Respondent 4 who argued:

> "As far as the skills in government are concerned, we have the expertise we need. What is lacking is IT leadership. The State Information Technology Agency, for example, has adequate IT experts who often lack leadership acumen. The institution, as a result, has failed to carry out its mandate despite having a pool of talented IT experts".

In the transformation of institutions, resourcing of institutions is pertinent to the implementation of mechanisms aimed at promoting transformation. ICT leadership plays a key role in directing the resources and activities aimed at promoting the transformation of institutions. Leadership is discussed in greater detail in some sections in this chapter. Due to

the political nature of government, the leadership of digital transformation cannot be left to technology experts as they often lack the political knowledge and skills required to influence policy direction and implementation. This is consistent with recommendations from legislation such as the Public Administration and Management Act and the Public Sector Corporate Governance of ICT Framework that IT leadership responsibilities should be assigned to political heads. The non-implementation of legislative and policy recommendations is worrying and partly the reason for challenges in policy implementation.

7.9 Policy and legislation

Regulative mechanisms such as policy and legislation are important in the institutionalisation of reforms. Implementation of legislation that promotes digital transformation has however been delayed. The Protection of Personal Information (POPI) Act which was enacted in 2013 is yet to be proclaimed into law by the President. The Cybercrimes bill drafted in 2015 is yet to be passed as law. These delays point to weaknesses in the implementation of policy. Policy and legislation development and implementation in South Africa is a long and complex process that involves consultations with various stakeholders. Reasons for delays in the implementation of policy and legislation range from prioritisation, resourcing and resistance by key role players and the public. The impact of policy delays in promoting the digital transformation agenda was highlighted by respondent 2 who commented:

> "The challenge is that we are still waiting for the finalisation of the National E-strategy to inform policy direction and priorities when it comes to the digital transformation of government".

Without regulative mechanisms, it is clear that institutions often fail to legitimise and justify some of the activities that might be aimed at promoting digital transformation. This is especially true in highly regulated institutions such as government.

Some policies and legislation have also been abandoned at the final stages of implementation. The infamous National Security Regulations (Protection of State Information Bill), commonly referred to as the "Secrecy Bill" was drafted in 2010 but was never implemented despite being approved by parliament for the President to proclaim it into law. The "Secrecy Bill" received widespread criticism from civil society, human rights groups and media institutions. The bill was labelled as unconstitutional, a threat to democracy and a violation of the right to access information. According to the Nelson Mandela Foundation (2013:1), the bill was an attempt to set up "an access to state information regime parallel to that envisaged in the Constitution and given force by the Promotion of Access to Information Act (PAIA)". The President never proclaimed the bill into law due to pressure which was a threat to the President's legitimate authority as a defender of the constitution. Populism clearly plays a major role in the development, prioritisation and implementation of policies. This notion was reiterated by respondent 3 who commented:

> "The reason for the abandonment of the "Secrecy Bill" was clear. It was increasingly making the President unpopular".

Legitimacy is important for political leaders who often rely on popularity to be elected into political office. The loss of popularity is often unwelcome. This is especially true considering that the "Secrecy Bill" was drafted when the former President Jacob Zuma had just assumed

office and its rejection by other actors in the state was a threat to his legitimacy and his political ambitions.

7.9.1 Lack of policy and legislation coherence

Policy and legislative coherence are critical in enabling the successful implementation of regulative mechanisms aimed at promoting transformation in institutions. Legislation is a coercive mechanism aimed at encouraging the institutionalisation of the desired behaviour by using legal obligation as a basis for legitimacy. South Africa has promulgated legislation aimed at promoting integration, interoperability and information sharing in government. The comprehensive legislation is discussed in Chapter 5. The implementation of legislation, not necessarily its absence, is a major constraint in strengthening integration, interoperability and information sharing in promoting the digital transformation and smart agenda in government. Legislation that addresses some of the concerns such as privacy, security and trust in an integrated digital environment has been promulgated but are yet to be implemented. Some of the examples and challenges are unpacked in the comments below.

7.9.2 Lack of a common understanding

Comments from participants point to the lack of understanding of legislation by actors responsible for implementation of policy and legislation in government as a significant barrier in advancing the digital transformation agenda. Respondent 8 for example commented:

> "We have the POPI Act, it is new and it is not understood very well, hence its implementation is a huge challenge. POPI is good policy; the challenge is that it is misunderstood".

Respondent also commented: “As a department we cautious in how we are approaching POPI as we do not know the implications”.

The lack of understanding of legislation and policy often leads to unintended outcomes such as poor adoption and compliance. Commenting on the same issue, Respondent 14 reiterated:

> “With reference to legislation meant to promote the ethical use of information, other organisations have used legislation such POPI as an excuse to deny access to information on the basis that there were complying with legislation”.

The lack of understanding is clearly due to poor communication, training and capacity within the South African government. Commenting on the poor implementation of the POPI Act, Respondent 8 noted:

> “The Department of Justice and Constitutional development has not capacitated the departments to effectively implement it. Its implementation has therefore been a challenge”.

This often impacts the effective implementation of new policies and legislation. Despite the appointment of the Information Regulator in October 2016, whose role is to promote the effective implementation of the legislation and provide training, the office of the Information Regulator is not yet fully functional. Evidence from data also indicated that the office of the Information Regulator has resource constraints and intends to approach the National Treasury with regards to its budget allocation for the remaining Medium Term Expenditure Framework cycle (Information Regulator, 2017).

The Information Regulator, for example, is mandated by the POPI Act to undertake educational programmes for promoting the protection of personal information. Without adequate resources, institutional activities such as training and education programmes for promoting the legislation are unlikely to be successful. Commenting on the implementation POPI within their organisation, Respondent 8 further highlighted the lack of capacity within the Department of Justice, Constitutional Services and Correctional Service [and the Information Regulator] to train government departments on the implementation of POPI as part of the challenge.

The resourcing of institutions is discussed in greater detail in earlier sections. Poor resourcing points to poor prioritisation of institutional mechanisms established to promote the digital transformation of government. This often results in institutions failing to operate effectively. Institutional activities such as training, communication and education and the new structures that support the institutionalisation of reforms require resourcing. These challenges arise during the Habitualisation stages of the institutionalisation process where new structures are in the process of being established.

7.9.3 Unclear responsibilities

Policies aimed at advancing the digital transformation agenda are unclear on who is responsible for driving the digital transformation agenda in government. This is problematic as this could promote a lack of accountability. Commenting on the issue, Respondent 2 argued:

> "I think the successful implementation of policy also depends on supportive legislation, if we do not have a legislation that is clear, for example, on who is leading on the issues of e-government, they are likely to fail. The Department of Telecommunications and Postal Services, for example, has a mandate to

> develop the e-government strategy as mandated by the ECT Act but at the same time the Department of Public Services and Administration appears to have a similar mandate so we end up not knowing where to draw the line".

Moreover, when regulations, policies and legislation are unclear, it becomes challenging to effectively implement them. The transfer of SITA from the Department of Public Services and Administration to the Department of Telecommunications and Postal service has added to the confusion. Commenting on the issue, respondent 2 argued:

> "Now that SITA has been transferred to the Department of Telecommunications and Postal Services from the Department of Public Services and Administration, it has become so unclear on who is ultimately responsible for e-government between the two departments".

Changes in reporting lines shouldn't have been an issue if planning and implementation of reforms in government were integrated as accountability would be shared.

The implementation of the Digital Migration Policy in South Africa has been problematic due to challenges such as turf wars between government departments. Some of these challenges can be attributed to a lack of clarity from policies on issues around the responsibilities of various government departments involved in the implementation of transversal programmes such as digital transformation. Turf issues in policy related matters can be reasonably explained by Scott's view that "rules themselves are important types of resources and that those who can shape or influence them possess a valuable form of power" (Scott, 1987:508). The ongoing turf issues that have been fuelled by unclear regulative mechanisms are thus an indication of

ongoing power struggles within the government. This increases the risk of poor synergies in the implementation of policy. This notion was substantiated by Respondent 1 who commented:

> "The challenge with government departments is that they are always competing to get a bigger share of funding from the National Treasury when it comes to programmes; hence there is little integration as departments use their projects to leverage funding from National Treasury".

During the transformation of institutions, competition mandates and competing for resources is an indication of fragmentation which is consistent with the early stages of institutionalisation of reforms. The transformation may be weakened by long-established norms and value systems that may not favour the institutionalisation of new reforms. At this stage actors are fighting for self-preservation, domination or survival hence turf wars are a very common phenomenon. Confusion and a lack of clarity about regulative mechanisms suggest that the implementation of reforms is in the Habitualisation stage of institutionalisation.

The lack of policy and legislation coherence is also reflected in the structuring of departments meant to assist with driving digital transformation. This has contributed to the confusion surrounding the roles of the different departments. A significant example was the continued confusion of roles between the Department of Telecommunications and Postal Services and the Department of Communications. These sentiments were echoed by Research ICT Africa in their comments on the Electronic Communications Amendment Bill published for public comments on the 17th of November 2017. The Bill seeks to implement and give effect to the policy objectives set out in the National Integrated ICT Policy White Paper. According to Research ICT Africa (2018), the continued separation of the Department of

Telecommunications and Postal Services and the Department of Communications despite the context of convergence emphasised in the Integrated ICT policy was concerning. This is a view shared by the then Minister of Communications, Nomvula Mokonyane who has expressed hope for the integration of the two departments into one as part of the process of reviewing the size and structure of government departments initiated by the new President, Cyril Ramaphosa (IT Web, 2018). In June 2019, President Cyril Ramaphosa announced the reconfiguration of several ministries and departments. The Department of Communications and the Department of Telecommunications and Postal Services were merged to form the new Department of Communications and Digital Technologies (DCDT). This is a positive move that is aimed at addressing the effective coordination of the digital transformation agenda in South Africa.

7.9.4 Delays in policy implementation

Delays in the implementation of policy, legislation and other regulative mechanisms have slowed the digital transformation of government. Respondent 2 commented:

> "Developing policies is not an issue; the issue is who is supposed to take responsibility for their implementation. Our mandate is to develop policies, implementation is not our mandate. Good policies have been developed but without implementation, they cannot serve the purpose to which they were developed for".

Monitoring and evaluation of programmes are challenging if there is no clarity on the roles and responsibilities of the various actors involved. This also increases the risk of departmental turf wars which have compromised the digital transformation agenda. This has led to delays in the implementation of policies, a serious concern that has slowed the digital transformation and smart agenda.

We saw in Chapter 5 that there has been delays in policy implementation. A delay in implementation of policy also weakens the regulative pillar in institutions. Several policies and legislation meant to address concerns around integration and interoperability in digital transformation such as privacy, security and trust remain in limbo. The POPI Act promulgated in 2013 is yet to be fully implemented almost 5 years later. The Cyber Crimes bill promulgated in 2015 is also yet to be finalised and passed as an Act for implementation. The absence of these coercive mechanism increases the continued risk of non-compliance especially in the early stages of institutionalisation (Habitualisation). For example, in 2017 a data leak containing personal information of about 33 million South Africans was discovered online by government authorities. Commenting on the issue, the Information Regulator, advocate Pansy Tlakula argued that the leak had put South Africa into a compromising position (Eye Witness News, 2017). However, due to the fact that the Protection of Personal Information Act had not been passed yet, she argued that there is a lack of consequences. She reiterated, "So you see if the Act had come into existence for a maximum fine that is allowed to fine up to R10 million. We can't go ahead with that fine because the Act has not been passed." (Eye Witness News, 2017). Another significant example is the Electronic Communications and Transactions (ECT) Act of 2002 that mandated the Minister, within 24 months after the promulgation of the Act, to develop a three-year National E-strategy for the Republic. The National E-strategy took more than a decade to develop and was only published in 2017. In part, policy delays reflect priorities in policy implementation as discussed next.

7.9.5 Policy prioritisation

The presence of policy is not enough in advancing the digital transformation agenda if the implementation of such policies is not prioritised. Evidence collected in this study suggests that successful implementation of policies is linked to their prioritisation by the government as this

impacts the resourcing of activities for supporting the implementation. The power and influence of the so-called "super departments" such as the Presidency and the National Treasury in the prioritisation of policies were clearly evident in this study. Commenting on prioritisation of policy, Respondent 6 argued: "There are powerful ministries such as the Presidency and National Treasury, whenever they say things need to move there is compliance". Commenting on the same issue, Respondent 5 reiterated, "If you have a junior or lightweight in terms of the political head, the department will have a problem in implementing its mandate. I have witnessed government departments abandoning policies because the political head is not influential as far as the implementation of the mandate of the department is concerned". The role of power and politics in the adoption and implementation of policies is discussed in great detail in later sections. Section 5 of the ECT Act, 2002, for example, states that the "Cabinet must, on acceptance of the National E-strategy, declare the implementation of the National E-strategy as a national priority". More than a decade after this declaration in the ECT Act, the prioritisation of the National E-strategy is yet to be seen. The delays cast doubt on the extent to which it is considered a national priority.

7.10 The information sharing context

Understanding the context is critical in promoting, integration, interoperability and information sharing in government. The sub-sections below discuss the different contexts that impact information sharing in government.

7.10.1 The strategic context

The strategic context of information sharing is concerned about processes, structures and systems that enable integration, interoperability and information sharing. The comments below shed light on the business context of information sharing in government:

> "Information sharing is not formalised as there are no strategies or processes in place to address knowledge and information sharing in organisations. Information sharing happens on an ad-hoc basis" (Respondent 3).

> "I think it is very limited within the government as a whole. Information sharing has to be guided by a strategy to guide how information is collected, disseminated and shared. Unfortunately, we don't have that in our department". (Respondent 7).

> "Government is not taking the issue [information sharing] seriously as it is a nice to have; there is no government-wide framework for [information] and knowledge management" (Respondent 10).

The absence of strategies, frameworks and formal processes to guide the sharing of information in government is one of the barriers that have hindered information sharing in government to reach higher levels. Due to the bureaucratic nature of government, often characterised by highly formal and rigid processes, the lack of formal structures, processes and frameworks thus hinders cross-boundary information sharing. The quality of information that is shared in the absence of such mechanisms is often compromised. Evidence collected also suggested that trust is also compromised where there are no formal and strict processes and structures to govern how information is shared. Respondent 7 commented:

> "The challenge is that we sometimes share information outside of formal structures. Such information cannot be used for decision making and remains

> for ‘information’ purposes only as there are no strict guidelines on quality and other issues”.

7.10.2 The social context

The social context influences cross-boundary information sharing in government. Government institutions are by nature social systems and structures influenced by social behaviour, culture and norms. The comments below shed some light on the social environment in government and its impact in cross-boundary information sharing.

Similar to findings by Yang, Zheng and Pardo (2012), trusted social networks were found to play an important role in cross-boundary information sharing in government in the South African context. Respondent 9 for example commented:

> “There is no information sharing culture, people share information with people they know in their networks. Information sharing is often not formalised”.

Cross-boundary information sharing thus occurs within trusted networks that are not formalised. Trust is a key enabler of information sharing in informal networks as these are often not regulated. In the absence of regulative mechanisms, normative and cultural-cognitive elements such as group norms, shared values and beliefs are thus important in shaping the desired behaviour. Information sharing that occurs outside of the formal structures and networks hardly finds its way into formal structures due to the bureaucratic nature of government. Such information is usually for the benefit of the actors in those networks.

The information sharing culture also emerged as one of the key determinants for the success of cross-boundary information sharing initiatives in government. Respondent 11 for example commented:

> "The culture of information sharing, intellectual excellence and sharing best practices and methodologies is non-existent. Our culture as public officials is a major hindrance. The barriers we are facing have little to do with the legislative and policy framework and is to a larger extent as a result of the culture in the public service".

The comment above highlights the significant role of cultural-cognitive elements and norms in shaping social behaviour in institutions. Regulative mechanisms such as policies and legislation are bound to fail in shaping the desired behaviour when the cultural-cognitive elements are not in sync with the institution's transformation imperatives. The role of normative and cultural-cognitive mechanisms in institutional transformation is further unpacked later in this chapter.

7.10.3 The political context

The role of Information as a source of political power impacts cross-boundary information sharing in government due to the political nature of government. The role of power and politics is unpacked in some sections. Respondent 9 for example commented:

> "The challenge is that the performance delivery environment constrains information sharing and interoperability. Departments are only concerned with meeting their performance targets and they hardly pay attention to how they impact the mandate of other departments. Departments are concerned about

winning the best performing department award. It is all about status and power in government".

The comments above highlight the need to consider the organisational, political and social context in integration, interoperability and information sharing. Norms and cultural-cognitive elements that influence the information sharing culture, trust issues and power dynamics in institutions are influenced by the socio-political context. Understanding how the socio-political context shapes institutions and their activities helps in promoting successful transformation. Information sharing outside of formal networks as well as power and politics in the sharing of information, signify low levels of cross-boundary information sharing maturity.

7.10.4 The inter-organisational context

From the evidence collected, it is clear that cross-boundary information sharing in government is yet to reach higher levels of maturity. Structures to strengthen formal information sharing have been established. The challenge seems to be the effectiveness of such structures as a mechanism for improving cross-boundary information sharing. Some of these structures are discussed in earlier sections. The comments below shed further light.

Data collected indicated that information sharing within established structures and networks was not adequate**.** Respondent 5 for example commented:

> "We share information within our respective clusters in government. Sharing of information outside of the clusters is a rare phenomenon. This is, however, a challenge as some of our work impacts or is impacted by other governments that are not in our cluster".

Evidence also suggested that information sharing was a bureaucratic process as reiterated by Respondent 13:

> "Information sharing is a tedious process that involves completing forms and some delays in the approval process to access information or data".

The inefficiency of existing structures in strengthening cross-boundary information sharing was also cited as a constraint. Respondent 12 commented:

> "We have various forums for sharing information such as Clusters and Director General Forums, the extent of their effectiveness remains to be seen. For example, we still have departments giving conflicting messages about policy direction despite the existence of such forums meant to address such challenges".

The inefficiency of some structures was substantiated by Respondent 6 who commented:

> "To strengthen information sharing government established the Government Information Technology Officers Council (GITOC). Unfortunately, GITOC is an inefficient structure as it has failed in its role of policy advisory on issues related to the digital transformation of government. GITOC is also meant to strengthen the sharing of policy information within government but is clearly not effectively fulfilling that role".

There were also indications that formal agreements are in place to promote information sharing among government departments. Respondent 7 commented:

> "We have Memorandum of Agreements (MOAs) with other government departments to formalise information sharing. These remain formal agreements that are not implemented in the majority of cases".

In bureaucratic institutions such as government where resources and activities are strictly controlled by regulative mechanisms such as policies and legislation, formal agreements are meant to assist in promoting information sharing. Formal agreements and mechanisms are however not adequate if they are not supported by other institutional mechanisms such as norms and value systems that promote a culture of information sharing as discussed in earlier sections.

Fostering of inter-organisational relationships outside of the formal networks was also found to be important in promoting cross-boundary information sharing. Respondent 8 for example commented.

> "We have formed relationships with other departments to share information and data. We do not have challenges in accessing information and data from departments we have fostered a relationship with. The challenge is always accessing information from departments that we do not have formal relations with".

This view was reiterated by Respondent 13 who argued:

> "Having formal Memorandum Agreements helps in information sharing as some departments won't just share their data without formal agreements in place".

Here again one may observe how the bureaucratic nature of government influences the success of cross-boundary information sharing. Cross-boundary information sharing is challenging where formal mechanisms to govern the relationships with other institutions are not in place.

Interpersonal relationships and informal personal networks were also found to be catalysts for information sharing. Respondent 9 commented:

> "Due to the absence of an information sharing culture, people share information with people they know. Information sharing in that instance is not formalised. If you don't know whom to approach, the process of accessing and sharing information can be frustrating".

This again highlights the importance of informal trusted networks in cross-boundary information sharing where formal networks or structures are weak. Trust is seen as a catalyst to cross-boundary information sharing where formal mechanisms are non-existent to govern the sharing of information. Evidence also suggests that informal trusted networks are often effective in paving the way for establishing formal networks as they are often built on trust, cohesion, common goals and strong relationships.

7.10.5 The technology context

The technology context focuses on technical issues surrounding the sharing of data and information, it is particularly concerned with the quality, accuracy, timeliness, consistency and completeness of information. The technology context also impacts the four constructs of cross-boundary information sharing (information quality, systems quality, service quality and public system service) proposed by Yang and Wu (2015) as discussed in Chapter 2. The comments below shed more light on the technology context and its impact on cross-boundary information sharing.

The poor quality of data and information was found to be a constraint in promoting cross-boundary information sharing. Respondent 8 for example commented:

> "The poor quality of the data held by some organisations as well as the integrity of their databases is one of the reasons why organisations are often reluctant to integrate their databases or share their data. They fear to open themselves to scrutiny over the integrity of their data".

Evidence also suggested that poor data quality was a result of lack of capability such as skills and infrastructure within departments. Respondent 13 commented:

> "Issues of data quality are as a result of a lack of capability in the departments (skills and infrastructure). You need stable infrastructure and skilled people to assist departments in designing, developing and maintaining databases and systems".

The comment above reflects the extent to which concerns around information quality constrain cross-boundary information sharing. In the face of increasing public scrutiny in the current socio-political environment, government departments are increasingly worried about reputational damage. Reputation in the public sector is often used as an important basis for power (Buchanan & Badham, 2009). In the face of competition for resources and legitimacy, reputation has become a significant power base for public institutions, the majority whom have lost legitimacy and are under scrutiny from the public and other stakeholders. This is due to an increasing number of cases of poor governance and mal-administration in the public sector in South Africa.

The poor adoption of standards for cross-boundary information sharing has also slowed progress in the digital transformation of government. Poor compliance and lack of understanding of the value of the adoption of standards is among some of the factors that have contributed to that. Respondent 6 for example commented:

> "We have established standards and a Government-Wide Enterprise Architecture framework but compliance remains low. Some departments choose to ignore these standards and frameworks. Adoption among departments that understand the value of integration has however increased".

The poor adoption of standards as a barrier was also confirmed by Respondent 12 who commented:

> "There is nothing wrong with the various norms and standards such as the Government-Wide Enterprise Architecture framework and the Minimum

> Interoperability Standards. The challenge is that departments have chosen to ignore them".

Here we see evidence of non-compliance with normative mechanisms as an indication of low levels of information sharing maturity. Standards are less likely to thrive in the absence of regulative mechanisms for coercing actors into complying. This has been worsened by the poor monitoring and enforcement of standards. Poor adoption and poor adherence to standards have in turn compromised systems quality, a key determining factor in cross-boundary information sharing.

The information and communication infrastructure in some government departments was also described as "legacy" and outdated and did not fit into the future plans of a digitally transformed and smart government. Respondent 12 commented:

> "The majority of government departments have legacy systems which make integration and interoperability a challenge as the technology is old and incompatible with new standards for interoperability".

The comment on legacy infrastructure also highlights poor systems quality which has consequently affected service quality in the South African government. Legacy infrastructure has denied the government an opportunity to reap the benefits of improved service delivery synonymous with digital transformation of governments into smart governments. Resourcing of institutions in the implementation of mechanisms aimed at promoting digital transformation is critical, as discussed earlier. The 2017 Auditor General report on the performance of the public sector also confirmed findings of this study that that ICT infrastructure remains one of

the constraints in modernising and transforming the public sector (Auditor General South Africa, 2017). Modernising ICT infrastructure is one of the pre-requisites for improving integration, interoperability and information sharing.

7.10.6 The socio-historic and socio-economic policy context

The socio-historic and socio-economic context cannot be ignored in the adoption and implementation of policy decisions in South Africa. South Africa's history is clouded by the social injustices perpetrated by the apartheid government that led to the socio-economic exclusion of certain racial groups. Since the attainment of freedom in 1994, the transformation agenda has therefore been high on the government agenda. Socio-economic policies and legislation, including the country's constitution have promoted transformation, equality and social justice as national imperatives. This has influenced the prioritisation of policies in government.

The digital transformation and smart governance agenda in South Africa is driven by the need to transform the public service to be more efficient, effective and responsive to the needs of the citizenry particularly in addressing the triple challenges of poverty, inequality and unemployment. The Integrated ICT policy White Policy for example "introduces a range of interventions to ensure that everyone in South Africa, regardless of who they are, where they live or their socio-economic status can improve the quality of their lives by accessing the benefits of participating in the digital society" (South Africa, 2016:1). Evidence collected in this study suggests that policies, initiatives and programmes with a significant impact in addressing these socio-historic issues were more likely to be prioritised. The digital transformation agenda, despite being recognised as contributing to the socio-economic transformation agenda, is still perceived as less important compared to other national priorities

with a direct impact in ending poverty, unemployment and inequality. This has ultimately influenced its level of prioritisation in government programmes.

7.10.7 Inter-governmental relations and collaboration

Another dimension which emerged quite strongly, both as a key determinant and outcome of integration, interoperability and information sharing is inter-governmental relations and collaboration. Collaboration readiness and organisational compatibility enhance e-government interoperability and integration by accessing readily available resources such as human capital, technology, training and funding as well as policies and practices (Pardo, Nam & Burke, 2012). Cross-organisational compatibility is defined "as the degree to which the work styles, interpersonal relationships, participation in decision making, levels of competition and collaboration, styles of conflict resolution, and organisational cultures support information sharing" (Pardo, Nam & Burke, 2012:15).

To assess the state of readiness for integration and interoperability, participants were asked to comment on the state of collaboration in government focusing on culture, decision making and inter-organisational relationships. Below is what some participants had to say.

Respondent 10 for example commented:

> "The lack of information and knowledge management hinders effective collaboration in government. A framework for information and knowledge management will assist in guiding government to government collaboration, information and knowledge sharing".

Although knowledge management as a concept is outside of the scope of this study, its significance in the integration, interoperability and information sharing problem is clearly evident. Knowledge management promotes a culture of information sharing (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004). This is key in promoting collaboration in government by strengthening the exchange of information, knowledge and ideas.

Government departments are interdependent which necessitates collaboration. Respondent 5 for example commented:

> "Government departments cannot afford to continue with the silo mentality as the work they do is inter-dependent".

The interdependence is, however, more pronounced in departments with similar mandates or where departments contribute directly to each other's mandates. This has led to the formation of clusters whose main objective is to ensure proper coordination of all government programmes at national and provincial levels (South Africa, 2018). See detailed discussion on government clusters in Chapter 5 and earlier in this chapter.

The lack of a strategy to guide government departments in collaborating has resulted in poor collaboration due to the bureaucratic nature of public institutions that thrive on formal rules and guidelines. Without a strategy or framework to guide the allocation of resources and activities to foster collaborative initiatives, it is often challenging for government departments. Respondent 11 commented:

> "Collaboration is on a case by case or need basis. We do not have a strategy in place to foster collaboration with other government departments. The challenge with this approach is that some government departments often find it difficult to commit due to the absence of a framework to guide departments".

Evidence also suggested that collaboration is more pronounced at an implementation level between actors in government departments responsible for implementing programmes. Respondent 13 commented:

> "Collaboration is at a lower level between directorates within government departments who may see the need to collaborate".

Respondent 9 reiterated, "Collaboration can be more impactful if it's incorporated during the process of policy and programme planning in government not just at the implementation of policies and programmes". This suggests that the timing of collaboration is critical in ensuring its success.

Evidence also suggests that rigid structures in government departments often make collaboration a challenge. Respondent 7 commented:

> "We often need a formal written Memorandum of Agreement to meaningfully participate in some of these initiatives. The process is often tedious and by the time the agreement is finalised the momentum would have been lost".

It is clear from the comments above that rigidity of institutional structures often slows down change and transformation of institutions. The successful implementation of reforms often requires the institutionalisation of new structures to support such reforms. The rigidity of structures and other mechanisms is consistent with earlier stages of institutionalisation (Habitualisation) where old structures often coexist with new structures. Old structures can be deinstitutionalised by the institutionalisation of new norms and value systems that support new structures and systems. Coercive mechanisms are necessary during this process as they prescribe rules, laws and other regulative mechanisms to guide institutional actors in how to behave appropriately. Failure is also likely to be high in this stage due to a lack of social cohesion, confusion and resistance. The use of coercive power and legitimate power in the formation stages are likely to be dominant especially where norms and cultural-cognitive elements are not supportive of transformation.

Competing mandates and the battle for supremacy often lead to poor collaboration as government departments are often concerned with achieving their own targets. Respondent 9 commented:

> "The performance delivery environment stifles collaboration. Government departments are concerned about meeting their targets, and often pay little attention to how they impact the mandates of other departments".

This often comes at a cost, especially where the successful implementation of policies depend on collaboration and coordination with other departments. This is true of many public institutions that operate within a socio-economic and socio-political system that is intertwined. Mandates such as digital transformation for promoting social and economic transformation are

transversal by nature. The implementation of such mandates cuts across several government departments and calls for collaboration.

Poor collaboration and intergovernmental relations have compromised digital transformation initiatives due to poor coordination of policy and resources. Respondent 2 for example commented:

> "One of the challenges is that we do not know where our role ends and where that of other departments begins. As a result, a lot of things are likely to fall in between the cracks".

Poor policy coordination often leads to inefficiencies, duplication of effort and wastage of already scarce resources. Constraints in policy coordination and implementation were unpacked in previous sections.

Some of the evidence points to the lack of integrated planning as a constraint in integrating and interoperating government information systems. This has led to poor coordination, policy incoherence, competing priorities and mandates, and inter-departmental conflict. Participants highlighted several issues surrounding the lack of integrated planning in government. Some of the comments are discussed below.

Competing priorities was found to be one of the constraints compromising collaboration among government departments, a key element in the implementation of policy. Competing priorities are also an indication of low levels of integration in government. Respondent 6 had this to say:

> "The buy-in is still low in the implementation of programmes and policies for promoting the digital transformation of government. Government departments are focusing on their own priorities. If priorities were linked there will be more collaboration".

Integrated planning is also a key determinant for achieving integrated government. Respondent 9 reiterated:

> "I wouldn't speak about integrated government as we are certainly not yet at the level of integrated planning. Integrated government involves integration at all levels of government starting with planning".

The notion of poor integration and collaboration was reinforced by Respondent 6 who argued that there was little collaboration in developing strategies and implementation plans as government departments were only concerned with their own priorities.

The above comments suggest that integration in government should go beyond technical systems and should start at the strategic level (planning and decision making) in government. The lack of integration at a planning and decision-making level compromises the implementation of policy, especially where implementation is the joint responsibility of several government departments. Poor planning and coordination also increase the risk of poor implementation of policies. Respondent 2 for example commented:

> "I don't think we have reached desired levels in integrating government. There is so much that is left to chance. The coordination is more on reporting with little or no coordination at planning".

This raises a question of how integrated reporting is expected to increase efficiency when there is little or no coordination at a planning level. This also impacts the ability of government to deliver on its national goals through national departments that contribute to different mandates. Digital transformation, for example, is not just the responsibility of one department such as the Department of Telecommunications and Postal Services. Several departments e.g. the National Treasury, the Presidency and Department of Public Services and Administration have a role to play. The National Treasury, for example, provides the much-needed funding while the Presidency needs to ensure that policies and programmes aimed at promoting digital transformation are also prioritised. The Department of Public Services and Administration is responsible for ensuring that the adopted policies, norms and standards become institutionalised in government departments.

7.11 Summary

The South Africa government is promoting digital transformation and smart governance through the integration and interoperability of e-government systems and improving information sharing among other things. This is important in promoting collaboration and synergy in government so as to improve integrated planning, operational efficiency, governance and service delivery. To transform into a smart government, greater levels of integration, interoperability and information sharing are needed. Findings from the study, however, point to low levels of integration and interoperability between government departments. The South African government has put in place initiatives aimed at integrating and interoperating data across departments. There is little evidence of integration at higher

levels (process or business) despite calls by policies and legislation to integrate and interoperate business systems and processes across government.

Unclear policies and legislation meant to address security, and privacy concerns, build trust and give clear direction, as well as delays in the implementation of such mechanisms, are some of the regulative barriers that have compromised the transformation to smart governance. These have been further compromised by poor compliance with normative mechanisms such as structures, standards frameworks and norms developed by the government to strengthen integration and interoperability. The sedimentation of cultural-cognitive elements such as cultural systems and beliefs have been compromised by turf wars, power and politics, lack of social and political cohesion, trust issues. These have weighed heavily in the implementation of initiatives aimed at promoting integration, interoperability and cross-boundary information sharing. The commitment of political leadership in driving the digital transformation and smart agenda has also had a bearing on the success of integration and interoperability initiatives. Coordination and prioritisation of initiatives that promote the digital transformation of government have been poor.

Power and politics in institutions have had a significant bearing on the digital transformation of government. Political and social cohesion was found to be weak in the early stages of institutionalisation characterised by self-interests, lack of shared norms and value systems. These have been a source of conflict in institutions. Top political leadership are key actors in the institutionalisation or transformation of institutions due to their legitimate, political and coercive power in the implementation of policy. Actions of institutions and actors associated with those institutions were found to be one of the factors that are impacting their legitimacy. Legitimacy, which is socially and politically governed, is also important in the transformation

process. The next chapter draws conclusions to this study from the findings in the previous chapters.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

This chapter draws conclusions to this study from the findings in the previous chapters. The conclusions drawn respond to the purpose of the study which was to understand institutional barriers to integration, interoperability and information sharing using a multidisciplinary perspective and Institutional Theory and the Circuits of Power Framework as lenses. This is critical in improving the integration and interoperability of e-government systems and promoting a seamless flow of data, information, knowledge and innovation across government departments for improving efficiency, coordination, planning and governance. To address this purpose we draw attention to the three objectives that shaped this study which are:

1. To **analyse** institutional barriers preventing the effective implementation of institutional mechanisms (regulative, cultural-cognitive and normative) aimed at institutionalising desired behaviour in the transformation of political and social institutions.

2. To explore the institutional mechanisms implemented by goverments to promote integration, interoperability and information sharing in support of a digital transformation and smart governance agenda.
3. To **analyse** and **explain** how Institutional Theory and the Circuits of Power Framework aid our understanding of the digital transformation of political and social institutions such as government.

This chapter also highlights the theoretical and practical contributions of this study to the information systems and e-government discipline. In contributing to practice, this chapter also gives recommendations to strengthen policy-making and implementation. This chapter responds to the three research questions that shaped this study.

1. What institutional barriers is the government facing in its bid to improve information sharing, integration and interoperability of its systems?
2. What institutional mechanisms do governments implement to address barriers to integration, interoperability and information sharing?
3. How do Institutional Theory and the Circuits of Power Framework aid our understanding of the digital transformation of political and social institutions given their complexity?

The **first question** sheds light on barriers to e-government integration, interoperability and information sharing in South Africa. The objective is to understand the nature of the barriers confronting social and political institutions such as the government in their digital transformation journeys.

The **second question** discusses the South African government's response to the barriers to e-government integration, interoperability and information sharing in public institutions. Here the focus is on understanding how the South African government is promoting the institutionalisation of reforms aimed at promoting digital transformation. It also seeks to understand the challenges surrounding the implementation of institutional mechanisms (regulative, normative and cultural-cognitive) aimed at promoting the digital transformation of government.

The **third question** responds to how Institutional Theory and the Circuits of Framework can help researchers and practitioners in understanding the transformation of political and social institutions given their complexity. This question also seeks to extend theory in e-government and information systems by making use of Institutional Theory and the Circuits of Power Framework in understanding and explaining institutionalisation or institutional transformation.

8.2 Reflection on the methodology used

The study is interpretive in nature and used the case study method as its method of inquiry. Interpretive research has often been criticised for lacking rigour (Yin, 2009; Gupta & Mukhopadhyay 2014). To evaluate the quality of research, I use the principles of interpretive research proposed by Myer & Klein (1999:72) to ensure that the study was rigorous. The evaluation is highlighted in Table 23.

The study used a multidisciplinary approach because e-government studies are considered multidisciplinary. Although this study is in the information systems domain, it made use of other disciplines such as political science and public administration. Although the study started as a multidisciplinary study it reflected some features of an interdisciplinary study by integrating concepts from different theories in building theory. This is a challenge likely to be faced by young disciplines such as e-government and information systems, which have often been criticised for lacking their own theory and disciplinary identity. Such disciplines have been forced to rely on other disciplines for theory (see discussion in Chapter 3). Information systems as a discipline has been evolving since the 1960s (Hirchheim & Klein, 2012). The history of e-government can be traced back to the late 90s (Grönlund & Horun, 2004). The integration of theories or perspectives from other disciplines in such disciplines is critical in building theory.

Table 23: Evaluating the research using the principles of interpretive research, Myer & Klein (1999:72)
The Fundamental Principle of the Hermeneutic Circle This was applied through the understanding of context and connecting factors relevant to the study. The purpose of the study, objectives, research sub-questions, theoretical framing, background and context were all important in understanding the problem being investigated. The study also used a multidisciplinary perspective to understand the connecting factors relevant to the problem.
The Principle of Contextualization This was done through a reflection on South Africa as a developing country that has made great strides in improving the socio-economic landscape but is still being confronted by social, political, economic challenges that have slowed its progress including e-government.
The Principle of interaction between the researchers and the subjects As a researcher, I was aware of how my own experience, knowledge and background and that of the participants can influence certain perceptions about phenomena in this study.
The Principle of Abstraction and Generalization This was applied through the use of theory to assist in the development of key concepts, the drawing of specific implications, and the contribution of rich insight as Walsham (1995a) put it. In this study, the findings are discussed in relation to Institutional Theory and the Circuits of Power Framework which are the two theories that framed this study.
The Principle of Dialogical Reasoning This was applied by reflecting on the philosophical assumptions shaping this study including the philosophical roots, justification of choice of paradigm, the advantages and disadvantages of its application in this study so as to make the process as transparent as possible.
The Principle of Multiple Interpretations This principle was applied by investigating the role of the social context upon the actions under study by seeking out multiple viewpoints (through interviews) along with the reasons for them so as to understand certain dynamics as recommended by Myers and Klein (1999).
Principle of Suspicion The researcher applied this principle by asking similar questions to different participants to corroborate the evidence and then critique the evidence. The data that emerged from various sources were triangulated.

8.3 The 1st research question: Institutional barriers

This study classified barriers to e-government integration, interoperability and information sharing into (i) regulative (ii) normative and (iii) cultural-cognitive barriers. Regulative barriers

are as a result of policy and legislation challenges. Normative barriers are as a result of weaknesses in norms and standards. Cultural-cognitive barriers point to the weaknesses in value systems, institutional culture, social behaviour and belief systems that compromise the implementation of reforms such as policies and other normative mechanisms aimed at promoting transformation. Table 24 highlights the sections that discussed the three types of barriers.

Table 24: Discussion of barriers to integration, interoperability and information sharing

Type of Barrier	Barriers	Literature (Chapter 2)	Analysis of data (Chapter 7)
Regulative	Legislation Policy Procedures Rules	Guijarro, 2007; Scholl &Klischewski, 2007; Lips, O'Neill & Eppel, 2011; Otjacques, Hitzelberger & Feltz, 2007.	Section 7.9
Normative	Standards. Norms Principles	Dawes, Cresswell & Pardo, 2009;Cordella & Lannacci , 2010; Pardo, Nam & Burke, 2011; Fan, Zhang & Yen , 2014	Section 7.7
Cultural – Cognitive	Trust Leadership Culture	Lam , 2005; Dawes, Cresswell & Pardo, 2009Zhang & Dawes, 2006; Lips, O'Neill and Appel, 2011; Yang, & Maxwell, 2011 Fan, Zhang & Yen, 2014;	Section 7.2; 7.3; 7.4

8.3.1 Regulative barriers

Regulative barriers are those associated with coercive mechanisms such as legislation and policy. Regulative barriers identified in this study included the absence of regulative mechanisms, delays in implementation, poor harmonisation and poor understanding of regulative mechanisms. This study also found that constraints in integration, interoperability and information sharing were as a result of poor implementation of regulative mechanisms such as policy and legislation and not their absence.

The poor implementation of regulative mechanisms such as policy and legislation was as a result of weaknesses in the normative and cultural-cognitive pillars in institutions among other things. Institutions are complex social, political and technical systems that do not only function

in strict rules and regulations but with other mechanisms such as norms and cultural-cognitive beliefs that shape social behaviour. The ineffectiveness of regulative mechanisms was linked to other social and political issues such as norms, value systems, poor social and political cohesion and mistrust. The development and implementation of regulative mechanisms need to take into account the social and political, and to some extent the socio-historic context. The implementation of good policies has at times failed due to political interference, mistrust and social upheaval. A significant example is the National Broadband policy which hasn't been effectively implemented to promote universal access to broadband internet due to poor coordination.

8.3.2 Normative barriers

Normative barriers such as long-established norms not supportive of change or transformation were also found to be a constraint in promoting digital transformation through integration, interoperability and information sharing. Norms such as the following of strict bureaucratic and unwritten rules have hindered the institutionalisation of new structures, norms, standards and value systems meant to promote transformation. The establishment of structures such as SITA for example, have to some extent failed to drive the digital transformation agenda due to failure by government departments to recognise the role of SITA.

Adoption of new norms and standards for improving integration and interoperability remains poor. Structures established to coordinate and lead the digital transformation of government remain ineffective. Evidence in this study pointed to the need to deinstitutionalise long-established norms and value systems that might hinder the institutionalisation of new norms and structures for promoting transformation.

8.3.3 Cultural-cognitive barriers

Cultural-cognitive barriers such as belief systems, practices, culture and value systems were found to play a role in the success or failure of institutionalising norms and regulative mechanisms for promoting digital transformation. The institutionalisation of values systems such as the 'Batho Pele' principles, for example, was found to have been compromised by a long-established culture that is not supportive of the new value systems. Lack of leadership support and commitment is one of the factors found to have slowed the institutionalisation of cultural-cognitive elements aimed at promoting the transformation. Self-interested behaviour, populism and poor governance has cultivated a culture of mistrust and weakened social and political cohesion. Without trust and cohesion, the implementation of reforms aimed at promoting digital transformation has been compromised by poor collaboration, poor coordination and resistance.

Digital transformation practices are in the early formative stages of institutionalisation characterised by instability of structures. The use of normative and mimetic mechanisms in the institutionalisation of reforms needs to be supported by strong coercive mechanisms to influence the desired behaviour, especially where long-established norms are hostile to reforms or transformation. Normative and mimetic mechanisms were more likely to thrive in the absence of coercive mechanisms during the full stage of institutionalisation of reforms (Sedimentation) where there is greater stability to structures and social cohesion. The early stages of institutionalisation (Habitualisation) are characterised by greater instability of newly formed structures and poor social cohesion. The use of coercive mechanisms to discipline and enforce compliance as well as normative and cultural-cognitive mechanisms to foster social cohesion appears to be critical in ensuring reforms or change continue past the Habitualisation stage. At this stage, the deinstitutionalisation of long-established routines and norms that are

hostile to the institutionalisation of new reforms may be necessary. This is often the most challenging process and chances of failure are often high at this stage due to resistance, mistrust, fear and uncertainty. It is at this stage that top leadership needs to play a critical role in fostering trust and cohesion and engaging the different actors to promote the successful implementation of reforms aimed at promoting digital transformation.

8.4 The 2nd research question: Institutional mechanisms

The South African government has implemented several mechanisms aimed at addressing the integration, interoperability and information sharing challenge. These can be classified into regulative (policies and legislation) and normative mechanisms (norms and standards). Cultural-cognitive elements such as value systems and beliefs are institutionalised over time and are critical in supporting the other two pillars of institutions, but are less amenable to direct change through institutional mechanisms.

Regulative mechanisms (policy and legislation) are among the main mechanisms implemented to address the integration, interoperability and information challenges. Their role is to address the challenges identified in this study such as poor governance and leadership, poor collaboration, infrastructure weaknesses, and trust, security and privacy concerns etc. What remains a challenge is not the absence of these mechanisms but their implementation. Evidence in this study revealed that South Africa has developed a comprehensive policy and legislative framework to address integration, interoperability and information sharing challenges. The effective implementation of these policies and legislation remains a challenge. Some of the issues addressed by policy and legislation are highlighted in Table 25.

Table 25: Policy and legislation promoting integration, interoperability and information sharing	
Integration, interoperability and Information challenges	**Regulative measures**
Trust, security and privacy	POPI Act, 2013; Cyber Security Policy Framework, 2015; Public Sector Regulations, 2016
Infrastructure	The National Broadband Strategy and Policy, 2013; Integrated ICT Policy, 2016
Leadership	Public Administration Management ACT, 2014; SITA Act 1998
Governance	Public Administration Management Act, 2014; Public Finance Management Act, 1999
Collaboration	Intergovernmental Relations Act, 2005
Resourcing	Public Finance Management Act, 1999

Some of the challenges in implementing policy and legislation are as follows:

- Lack of recognition of the implementation of digital transformation reforms as one of the top priorities. Digital transformation has been recognised as a priority in key national policies and strategies such as the National Development Plan but the recognition hasn't translated into policy implementation. Section 5. (2) of the Electronic Communications and Transactions Act also declares that "the Cabinet must, on acceptance of the national e-strategy, declare the implementation of the national e-strategy as a national priority".
- Delays in the implementation of policies and legislation for addressing integration, interoperability and information sharing barriers. Several policies and legislation, which include the POPI Act of 2013 and Digital Migration Policy of 2008, have been delayed.
- Lack of understanding of policy and legislation by policy implementers has resulted in poor implementation. Legal battles in the implementation of policy (e.g. around the broadband spectrum) are also an indication of lack of understanding of some policy and legislative

directives, as well as roles, responsibilities and jurisdiction in the implementation of policies and legislation.

- Poor collaboration in the implementation of policies. The implementation of policies and legislation that promote digital transformation requires the collaboration of various role players which seldom happens. This often results in unnecessary delays, resistance and other complications such as legal battles between role players.
- Poor monitoring and evaluation of the implementation of policies and programmes. Evidence also suggests that policies and programmes that promote digital transformation are poorly monitored. Some government departments are yet to fully implement effective monitoring and evaluation programmes as per the Government-Wide Monitoring and Evaluation Framework.
- Poor capacity in the implementation of policy e.g. the Information Regulator appointed to oversee the implementation of the POPI Act to address issues of trust, security and privacy do not yet have the capacity to educate and train government departments on the POPI Act. Poor capacity is as a result of poor resourcing which consequently results in the failure to carry activities critical for the institutionalisation of reforms such as training and advocacy campaigns.
- Poor compliance and lack of consequences for non-compliance have resulted in continued disregard of legislative directives. Section 5. (1) of the Electronic Communications and Transactions Act of 2002, for example, directed that "the Minister must, within 24 months after the promulgation of this Act, develop a three-year National E-strategy for the Republic, which must be submitted to the Cabinet for approval". The National E-strategy was only finalised in 2017 and is yet to be implemented.

To support the implementation of regulative mechanisms, the South African government has put in place normative mechanisms discussed below. **Normative mechanisms** such as standards, norms, structures and value systems have been developed to address constraints around integration, interoperability and information sharing (see Table 26). In Chapter 5, norms and standards that have been implemented to address the integration, interoperability and information sharing challenge are discussed. These include norms and standards such as the Minimum Interoperability Standards, Minimum Information Security Standards and Government-Wide Architecture framework to name just a few. Here again, the study concluded that the challenge was the adoption of such standards and norms, not their absence. Some of the challenges include:

- Lack of compliance with standards and norms. SITA and the Department of Public Services and Administration have developed norms and standards such as the Minimum Interoperability Standards (MIOS) and Government Wide-Enterprise Architecture Framework (GWEA) but compliance remains low.
- SITA and the Department of Public Administration don't have the coercive power or regulative instruments to enforce compliance or discipline those that are not complying. In the absence of coercive mechanisms, such normative mechanisms are likely to fail especially in the early stages of institutionalisation of reforms where long-established norms and value systems are not conducive to transformation.

A discussion of results in Chapter 7 revealed that poor adoption and compliance was linked to trust issues, lack of enforcement of the standards and norms, and leadership challenges in institutions meant to enforce the standards.

The South African government has also implemented value systems (Batho Pele) meant to promote the improvement of service quality and accessibility of government services and accountability to citizens. Some of the issues that emerged in this study bring into question the extent to which the "Batho Pele" principles discussed in Chapter 7 have been institutionalised. Evidence of poor governance, poor service delivery and citizen mistrust of government by citizens are some of the indicators of poor institutionalisation of these principles.

Structures such as the GITOC, SITA, government clusters and intergovernmental relations directorates have been established to assist in the successful implementation of policy or the institutionalisation of reforms. Some of these structures, such as the clusters and intergovernmental relations directorates, have made some inroads in fostering trust, social and political cohesion, and better coordination of government programmes but challenges remain as evidenced by conflicts in the implementation of some policies. This is consistent with the early stages of institutionalisation (Habitualisation).

The institutionalisation of reforms or mechanisms for promoting digital transformation in government are compromised by long-established institutionalised practices, culture and norms some which are hostile to digital transformation. For institutionalisation of reforms to yield results certain practices, routines and norms in government need to be deinstitutionalised. Deinstitutionalisation of long-established practices, norms and value systems in institutions is a long process which needs to be factored in as part of the transformation strategy.

Table 26: Normative mechanisms	
Mechanism	**Discussed in section**
Standards	
MISS, MIOS, GWEA	5.5.3; 7.7.2
Value systems	
Batho Pele	7.7.1
Structures	
SITA, GITOC, Intergovernmental relations directorates	5.5.2 ; 7.6.2

Cultural-cognitive elements such as value systems and beliefs systems are institutionalised over time and often influenced by broader societal values, practices and belief systems. Governments often do not have complete control of broader social values, practices and belief systems. It is difficult for institutions to change their culture overnight. However, regulative mechanisms and normative mechanisms, as evident in this study, have been used to influence a change in social behaviour and culture through coercive and normative pressure. The Batho Pele principles, for example, are being used by the government as an attempt not only to change the norms but to influence a change in cultural-cognitive elements. Similarly, policies such as the Cybersecurity Policy Framework do not only aim to provide a legal framework for governing cybersecurity and ensure compliance but also to promote a cybersecurity culture.

8.5 The 3rd research question: Theoretical understandings

Institutional Theory and the Circuits of Power Framework can assist in understanding the actions of institutional actors, relations, politics and power dynamics, and other social behaviours in institutions during the institutionalisation of reforms or transformation. From the findings discussed in previous chapters, one can conclude that that implementation of reforms, transformation or changes in institutions bring anxiety and uncertainty which triggers certain behaviour or reactions from institutions and their actors as a form of self-preservation or survival. Self-interest behaviour, competition for resources, power struggles and populism were found to be more apparent during institutional transformation.

Evidence also suggests that although power and politics in institutions are often viewed as 'evil', politics and power dynamics in complex institutions also play a positive role in the institutionalisation of reforms. Power and politics can be used to shape or influence desired social behaviour. It can also be used to secure resources when they are scarce. The role of power and politics in the institutionalisation of reforms also cast a spotlight on the significant role of top political leadership in driving change. Top political leadership can use their political, legitimate or referent power to promote cohesion, compliance or discipline in the implementation of reforms.

The successful development and implementation of reforms that promote digital transformation are also heavily reliant on the interplay between power and politics in the setting up of government priorities. The setting up priorities is a complex process that involves negotiations, trade-offs and compromises. In the South African context, this process begins with consultations at the governing party level. The current governing party, the ANC then adopts policy priorities in its annual congress that often go on to inform national policy priorities. Once the ANC has adopted its priorities, a democratic process that involves public consultations involving citizens, the state and other non-state actors such as civil society is initiated. Institutions such as the state and political parties and other civil society groups that wield political power often influence the outcomes of some of these processes as they control public opinion.

Tolbert and Zucker's institutionalisation process assumes that the institutionalisation of innovation undergoes a linear process starting with pre-institutionalisation (Habitualisation) before moving to semi-institutionalisation (Objectification) and then full- institutionalisation

(Sedimentation). This fails to take into account the level of institutional characteristics such as innovation capability, structures, norms and culture. This may be true with some institutions but not with all. Institutions with a high level of innovation capability, a culture of continuous improvement and flexible structures are likely to respond to change and institutionalise new innovations compared to institutions with a low innovation capability, unsupportive culture and norms, and rigid structures.

8.5.1 The proposed Integration, Interoperability and Information Sharing Complexity Framework

Evidence from this study confirm the assertions by Scholl, Kubicek, Cimander and Klischewski (2012:313) that integration, interoperability and information sharing are intertwined and inextricably interrelated. This has often led to confusion not just in practice but also in theory. The interrelatedness of the three concepts as reflected in the INT-IS-IOP Framework proposed by Scholl et al. (2012) is undeniable. It is, however, important to highlight the differences between integration, interoperability and information sharing. The failure to distinguish them is often one of the reasons why the implementation of integration, interoperability and information sharing initiatives remains complex in government.

Integration, interoperability and information sharing carry different levels of complexity in terms of the technology capability requirements, security requirements, and levels of trust to be met, resource requirements, expertise, costs, standardisation and other organisational characteristics. The decision to either integrate or interoperate or to simply share information is often influenced by these factors, but most importantly by the intended goals or outcomes, as well as the goals or mandates of the agencies and their business processes. The proposed framework (Figure 11) is based on evidence collected from multiple sources that include an extensive review of the literature and a practical case study of an e-government integration,

interoperability and information sharing initiative. Some of the issues highlighted above are illustrated in the framework and are discussed next.

8.5.1.1 Goals and Mandates

The degree of similarity of goals, mandates and the intended outcome may impact decisions concerning the need for full integration or the option to stop at the interoperability or information sharing level.

Intended goals or outcomes

Intended goals or outcomes may vary from increased operational efficiency, integrated planning, reducing duplication, reducing costs, greater coordination and informed decision making etc. If the intended outcomes are to achieve all of the above then agencies may well opt to integrate. Due to the complexity of integration, organisations that simply, need to share information on an ad-hoc basis may opt for information sharing, or interoperation when they need to share more complex data without compromising the integrity and security of the data.

Mandate

The mandate of the organisation also influence the decision to either integrate, interoperate or share information. Agencies that have similar mandates may opt to integrate due to similarities in the work that they are doing and the demand for greater collaboration and coordination in their planning and operations.

Level of cooperation / collaboration

The level of cooperation or collaboration required may influence the decision as to whether organisations need to integrate, interoperate or simply share information. Cooperation at a strategic level may require the integration of planning systems and processes, while at operational levels the cooperation required may demand that organisations interoperate to share data for operational purposes.

8.5.1.2 Access to resources and budgets

Access to resources and budgets tends to increase as organisations desire to move from basic levels of information sharing to advanced levels of integration.

Costs and budgets

The costs tend to escalate as the complexity increases due to the technology capability required, high-level expertise, and level of collaboration required. Information sharing, for example, tends to be cheaper as compared to interoperability and integration as it does not require sophisticated technologies such as software, infrastructure and maintenance costs. Escalating costs in integration initiatives was found to have been one of the reasons why governments often abandon such projects. In South Africa, for example, Phase 1 of the Integrated Financial Management System project was abandoned resulting in wasteful expenditure of about R1, 2 billion. This resulted in the National Treasury instituting an investigation to probe allegations of poor management and governance.

Technology capability

Technology plays a critical role in integration, interoperability and information sharing. The technology capability, however, differs according to the requirements. Integration, for example, is more complex and requires a higher technology capability compared to interoperability where systems need to share or exchange data without necessarily integrating. Similarly, information sharing is less complex than interoperability as there are cheaper technologies that can be used for information sharing information such as repositories that do not necessarily require systems to interoperate.

Skills capability

The skills capability required to implement and maintain information sharing initiatives are often not as high compared to the skills required to implement and maintain integration systems. Such high levels of skills are, more often than not, inadequate in the public sector.

This often results in the public sector relying on private sector consultants to implement and maintain the information systems. This has also contributed to the escalation of costs associated with integration initiatives.

8.5.1.3 Organisational change

Integration, interoperability and information sharing may result in the need for changes in structures, systems or processes in those organisations participating in integration, interoperability and information sharing initiatives. The degree of change required is determined by the level of integration, interoperability or information sharing desired. Integration, for example, might require a high degree of organisational change as compared to information sharing due to the need to align systems and processes. The changes are described in detail below.

Organisational characteristics

Organisational characteristics such as the type of structure, institutionalised norms, practices, and culture and value systems play a critical role. Where bureaucracy is high or where a department deals with sensitive security issues, they may opt to share information on a need to know basis as integration may expose them to security risks. This may be true between, for example, agencies responsible for state security who may opt to integrate with agencies in the same cluster and only share information on a need to know basis with other agencies. Strong cohesiveness also makes integration easier as trust is critical when systems and processes are integrated.

Standardisation

The need for standardisation may increase as the complexity increases. As organisations move towards higher levels of interoperability and integration, technical standards and the standardisation of processes may be required. Standardisation is required for technical, process, semantic and other forms of interoperability and integration. Interoperability frameworks,

enterprise architecture frameworks, norms, security standards, and other standards and frameworks may assist in achieving this.

Business processes

The business processes or degree of similarity and standardisation may also influence the decision. Agencies with similar business processes, for example, are more likely to integrate their systems and processes compared to those that don't have similar business processes or use similar standards. Where business processes can't be standardised due to differences in business models, integration may therefore not be a viable option compared to interoperation where systems need to exchange data.

Innovation capability

Innovation capability also needs to be higher as the complexity increases. Integration often requires changes to some of the structures, processes and systems. The greater the complexity, the higher the innovation capability required to develop innovative solutions to some of the challenges that may be brought by the implementation of complex initiatives such as integration. Innovation is about challenging established norms, practices, processes and increasing efficiency and value.

8.5.1.4 Enablers of progression

The progression from information sharing to interoperability and integration is not a linear process. Progression is affected by some of the factors discussed in the previous-sub-sections. When an enabling environment is created, institutions may leapfrog some stages. From the evidence gathered in this study, the following are key enablers:

1) **Regulative mechanisms** such as policy and legislation create an enabling environment to advance from basic information sharing to interoperability or from information sharing to integration. This is important in highly regulated institutions such as the government that require policy and legislation backing to implement reforms that require resourcing

and transformation of structures, processes or systems. This is important in giving the initiatives legitimacy.

2) **Normative mechanisms** such as norms, standards and principles are also required in the progression. Basic information sharing, for example, might not require standardisation but interoperability requires standards to address issues such as systems quality, data quality, compatibility and systems interfaces.
3) **Cultural-cognitive mechanisms** such as beliefs, culture, value systems and leadership behaviour create an enabling environment for progression to more complex e-government initiatives such as integration. Creating a culture of continuous learning, improvement and innovation can help institutions prepare for changes. Leadership behaviour in leading such changes is also important especially in institutions such as the government that are bureaucratic.

Enablers such as regulation, norms and cultural-cognitive mechanisms allow organisations to better respond to isomorphic pressures from the institutional environment. Internal policies, for example, may need to be developed in response to coercive pressure form regulation and legislation. Organisations may better respond to normative pressures such as changes in industry standards and norms by adopting similar standards. Mimetic pressure such as industry best practices might require that organisations adopt new practices so as to keep abreast with such developments. Isomorphic pressure that acts on institutions during the transformation process is discussed below.

Stronger regulations, norms and cultural-cognitive mechanisms are also required to progress to full integration. Stronger regulations, for example, can help address concerns such as legitimacy. Normative mechanisms can address concerns around standardisation. Cultural-

cognitive mechanisms can help address issues such as trust, value systems and cohesion that are required to build stronger relations in preparation for the integration of processes, systems, structures and coordinated planning.

8.5.1.5 Isomorphic pressures

Isomorphic pressures (coercive, normative and mimetic) from the institutional environment also act on institutions and influence decisions taken regarding integration, interoperability and information sharing. Mimetic pressure, for example, is as a result of mimicking other institutions or following best practices. Coercive isomorphism is due to pressure from regulation which is sometimes not of the institution's making but from external forces that may include regional or international bodies in the case of governments. Normative isomorphism is as a result of pressure from industry norms and standards which require that institutions conform. The European Interoperability Framework (EIF) is an example of standards and norms that governments in Europe, for example, are pressured to conform to.

8.5.1.6 The framework

This discussion leads to my proposal that the appropriate level and achievability of integration, interoperability and information sharing can be understood using the proposed framework (Figure 11).

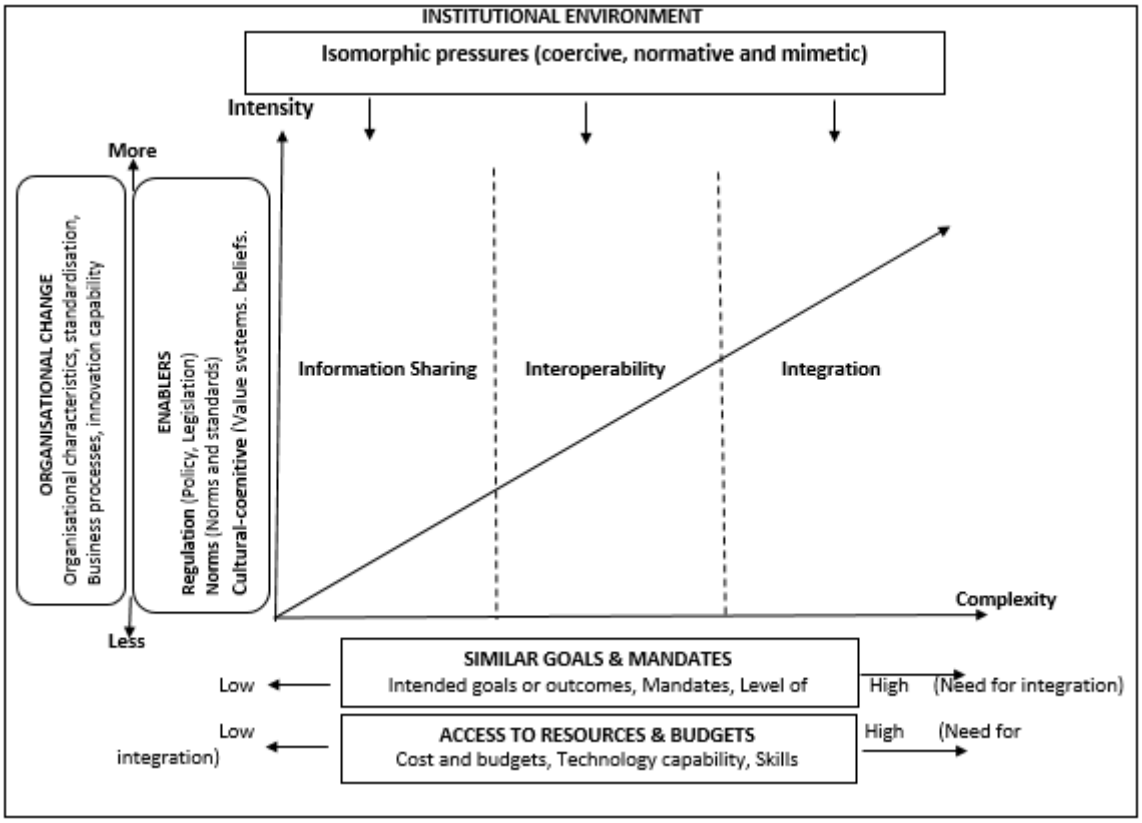

Figure 11: Integration, interoperability and information sharing complexity framework

This framework provides a theoretical basis to understand the complexity and some of the barriers to integration, interoperability and information sharing. The level of integration, interoperability and information sharing between entities that is appropriate depends on the extent to which they have similar goals and mandates and access to resources. The ability to achieve integration, interoperability and information sharing depends on enablers such as regulations, norms and cultural-cognitive elements and the capacity for change such as organisational characteristics and innovation capability. The whole process is affected by isomorphic pressures.

The intensity of organisational change programmes and key enablers such as the need to have new policies, rules, standards and shared value systems also increase as organisations move from information sharing to full integration which is more complex. The complexity also

varies within each level, for example in interoperability, process interoperability may be more complex than data interoperability. An understanding of some of these barriers and complexities will play a significant role in helping researchers to understand integration, interoperability and information sharing challenges.

For practitioners, the proposed framework can be a useful decision-making tool. It can help decision makers position their organisation. If two government agencies or departments have similar goals or mandates they might desire to achieve full integration for greater coordination in planning, operations and implementation of their programmes. Those with less similar goals, mandates or intended outcomes might opt for information sharing or interoperability due to the reduced likelihood of the need for integrated planning or coordinated implementation of programmes.

Enablers such as regulations and norms can modify the organisation and its environment to facilitate change thus increasing the engagement between departments even before full integration is achieved. In the South African context, regulations such as the Intergovernmental Relations Act have facilitated the change of structures of government through the introduction of clusters to facilitate engagement.

8.5.2 Power, Politics and Information Systems Institutionalisation Framework

The use of more than one theory in understanding complex phenomena such as the institutionalisation of new information systems in complex institutions such as government has become widely accepted in the information systems field. This is largely due to some of the shortcomings of using one theory as a lens for understanding and explaining multi-dimensional issues. Kromidha (2017) explored transitions of power in multi-actor information system projects by integrating the Actor-Network Theory and the Circuits of Power Framework. Silva

and Backhouse (2003) adopted the Circuits of Power Framework and Institutional Theory to study power in the institutionalisation of information systems.

The use of two or more theories thus provides an opportunity to extend theory by exploring phenomena from various lenses in one study. In this study, I used Institutional Theory and the Circuits of Power Framework. Concepts from both Institutional Theory and the Circuits of Power Framework were adopted in understanding phenomena such as power dynamics and the role of politics in the institutionalisation of reforms and deinstitutionalisation of institutionalised practices that constrain transformation. New Institutional Theory, for example, has been criticised for de-emphasising deinstitutionalisation of institutionalised practices in the transformation of institutions as a result of technology disruptions, social upheaval or regulatory reforms (Kholeif, Sherer & Abdel-Kader, 2008). The Circuits of Power Framework on the other hand "is not an exhaustive theory, yet it integrates several different concepts of power to account for the process of institutionalization" (Silva & Backhouse, 2003:297).

Silva (2007) argues that in addressing the theoretical and epistemological challenges presented by the study of phenomena such as power and politics in the institutionalisation of information systems, the use of meta-theories such as Institutional Theory should be complemented by a specific theoretical framework such as the Circuits of Power Framework. This study also explored the relationship between Scott's three Pillars of Institutions Framework, the Circuits of Power Framework and Tolbert and Zucker's Institutionalisation Process Framework in understanding the transformation of institutions.

I propose the Power, Politics and Information Systems Institutionalisation Framework. The proposed framework drew inspiration from the Circuits of Power Framework Clegg (1989),

Scott's Three Pillars Framework (Scott, 2014), Tolbert and Zucker's Institutionalisation Process Framework (Tolbert & Zucker, 1996) and Silva and Backhouse's Institutionalisation of Information Systems Framework (Silva & Backhouse, 2003). The proposed framework is a result of an extensive review of the literature in Chapter 2 and theory in Chapter 3, further informed by analysis conducted in this study in this study. The proposed framework is illustrated in Figure 12.

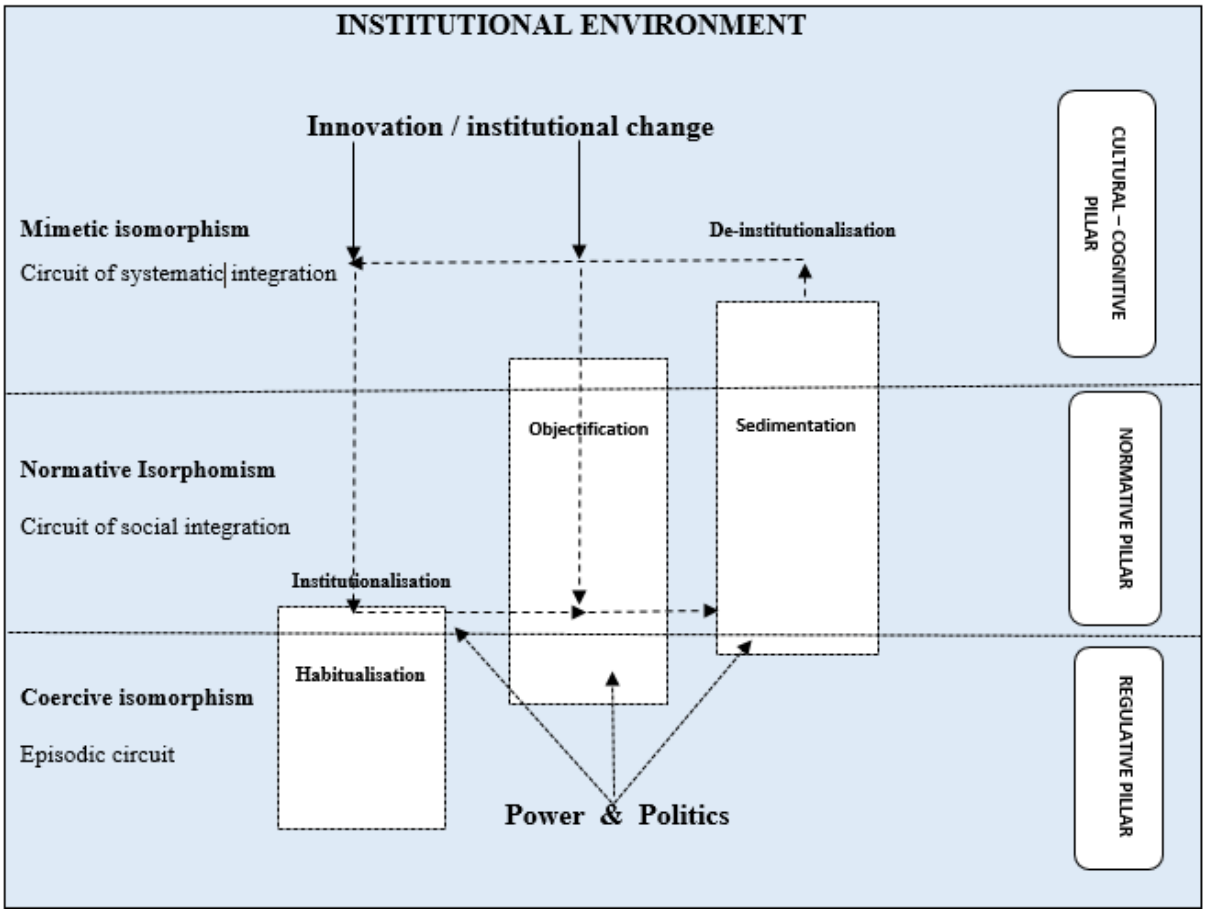

Figure 12: The Power, Politics and Information Systems institutionalisation Framework

The proposed Power, Politics and Information Systems Institutionalisation Framework models the institutionalisation of information systems innovations or changes. These are often influenced by the institutional environmental forces (coercive, normative or mimetic) such as legislation, industry norms, standards and best practices. Institutions and organisations may

adopt new innovations or information systems for various reasons that may include compliance with legislation, competitive advantage or efficiency and legitimacy.

The institutionalisation process is not linear and is influenced by institutional or organisational characteristics such as innovation capability, structures and culture. Organisations with a high innovation capability, supportive norms and culture and flexible structures may leapfrog some stages as compared to those with a low innovation capability and culture and structures that are rigid and hostile to change or innovation.

The complexity of the innovation or information system may also influence the institutionalisation process. Complex information systems or radical innovations may influence changes in processes, norms, structures and systems. In such instances, the institutionalisation of the innovation may have to go through the three stages of Habitualisation, Objectification and Sedimentation. Certain norms, practices and value systems may also need to be deinstitutionalised before the new information systems are institutionalised.

The proposed Power, Politics and Information Systems Institutionalisation Framework highlights the relationship between the circuits of power, institutional isomorphism and the institutionalisation/ deinstitutionalisation process in institutions. It highlights how the three circuits of power (episodic, social integration and systematic integration) play a complementary role in the institutionalisation/ deinstitutionalisation process.

In the episodic circuit, the use of coercive power through the regulative pillar in institutions is often necessary when institutionalising new reforms where existing norms, structure and systems are not supportive of reforms. The regulative pillar lays a solid ground for legitimacy

that is legally sanctioned and is required to implement reforms in highly regulated institutions such as government. In the circuit of social integration, normative pressure plays a leading role in the institutionalisation of reforms where power is dispositional and the emphasis is on the norms that shape behaviour and govern relationships in institutions. In the circuit of systematic integration where power is seen as being facilitative, the institutionalisation of reforms is often influenced by mimetic pressure driven by the desire to adopt new innovations, best practices and trends. Cultural-cognitive elements such as value systems, the organisational culture and other elements play a leading role at this stage.

The three pillars of institutions (regulative, normative and cultural-cognitive) also play an important role during the institutionalisation/ deinstitutionalisation process. Regulative mechanisms are used to enforce compliance with rules and laws and discipline during the habitualisation stage. Normative mechanisms such as norms and standards guide expected social behaviour during the objectification stage in institutions. Cultural-cognitive elements such as common beliefs also help foster social cohesion during the sedimentation stage.

There is evidence of links between the three circuits and the isomorphic pressures confronting institutions. Coercive pressure is closely linked to the episodic circuit. The episodic circuit considers power as being causal. It also concerns the ability of A to make B do something, which they may not otherwise have done (Clegg, 1989). This can be achieved through coercion. The circuit of social integration is linked to normative isomorphism where dispositional power influences the responses of actors. According to Silva (2007), the main elements of the circuit of social integration is that rules govern meaning and membership in organisations. Here institutionalised norms influence how actors behave in institutions. The systematic integration circuit, on the other hand, is closely associated with mimetic isomorphism where power is

facilitative. In the circuit of systemic integration, it thus takes more than the coercive pressure to facilitate change. For power to be facilitative, mimetic elements are thus required. Moreover, it is important to highlight that the circuits have no strict boundaries and contribute to the different isomorphic pressures experienced in institutions. In the circuit of systematic integration for example, normative, mimetic and to some extent coercive pressure may be experienced in facilitating the institutionalisation of innovation or changes.

Power, politics and legitimacy also play an important role in the institutionalisation and deinstitutionalisation process in complex institutions such as government. Political power, for example, can be used to influence the prioritisation of reforms aimed at promoting transformation. The resourcing of institutions is also heavily reliant on the political will of those with the political and legitimate power. Leadership also use their legitimate authority to implement coercive and normative mechanisms for promoting the institutionalisation of reforms. The various isomorphic pressures are likely going to be experienced in all the stages of the institutionalisation process. These are however experienced differently during the institutionalisation /deinstitutionalisation process as discussed next.

Coercive isomorphism is more likely to be applied during the initial stages of institutionalisation as new structures, norms and systems are often weak than at full institutionalisation where systems, norms and values are embedded in the organisation's routines. The decision to implement change from manual to digital systems in public institutions, for example, may be a result of pressure from legislation or policy directives. As digitalisation becomes embedded in public institutions, coercive pressure is less likely to be used in influencing institutions to adopt new digital systems. At the Objectification stages, normative isomorphism may be more pronounced as adopted norms, structures and value

systems become established. Mimetic isomorphism is also visible as organisations or institutions are likely to institutionalise systems and structures in their bid to mimic those that have been successful or due to pressure to follow industry best practices.

8.5.3 Multidimensional/ multidisciplinary approach

The study of e-government or information systems in public institutions requires an understanding of organisational, technological, political and social issues. This called for the adoption of a multidisciplinary lens in understanding complex phenomena in the transformation of institutions. Three disciplinary perspectives were used in this study:

(i) Information systems - The information systems perspective was used to understand organisational issues such as culture, inter-organisational relations, trust, processes, structures and other issues that impact integration, interoperability and information sharing

(ii) Political science - The political science perspective was used to understand how politics and power dynamics in institutions and the actors behind them impact their transformation.

(iii) Public administration – The public administration perspective was used to understand governance, leadership and policy issues in the digital transformation of government.

The choice of theory also reflects the multidisciplinary approach. Institutional Theory, for example, is a multidisciplinary theory with disciplinary foundations in political science, sociology and economics and has also been widely used in the information systems discipline. The Circuits of Power Framework also has its foundation in political science but has also been widely adopted in other disciplines including information systems.

Institutions have been described as social systems and institutionalisation as a social process (the sociological perspective) (Hughes, 1936; DiMaggio & Powel, 1989; Scott, 2014). Institutions have also been described as political systems and as symbols of power (power and politics perspective) (Clegg, Courpasson & Phillips, 2006). In this study, I adopted a multidimensional view of institutions as social and political systems and symbols of power. In understanding and explaining institutionalisation and other phenomena in this study, I integrated the sociological perspective and the power and politics perspective. The sociological perspective helps in understanding and explaining how behavioural systems, cognitive and normative systems influence institutionalisation. The power and politics perspective helps in understanding and explaining how power, politics and legitimacy help in institutionalising desired behaviour. Public institutions are by nature both political and social institutions. They are political institutions because politics and power dynamics influence how they are governed. They are also social institutions as they are composed of a group of people, systems and structures whose purpose is to serve society (social obligation).

8.6 Practical contributions

This study has implications for the practice of e-government and information systems in the public sector. Below I highlight the recommendations to policymakers, policy implementers and practitioners.

8.6.1 Recommendations for policymakers

Policy makers have a significant role to play in the institutionalisation of reforms as they are responsible for setting up government priorities and developing policies and legislation to support the priorities. Policy makers are also responsible for implementing mechanisms for supporting the implementation of policy reforms.

Monitoring the implementation of policy reforms

Some of the failures in the implementation of policy reforms aimed at promoting the digital transformation of government are as a result of poor monitoring of the implementation of reforms. Policy makers need to develop mechanisms for effective monitoring of the policy reforms at the same time as reforms are developed. Poor monitoring was found to have contributed to delays in the implementation of policy reforms aimed at promoting the digital transformation agenda. The South African government has established the Department of Planning, Monitoring and Evaluation to "facilitate, influence and support effective planning, monitoring and evaluation of government programmes aimed at improving service delivery, outcomes and impact on society" (Department of Planning, Monitoring & Evaluation, 2018:1) but challenges remain. Despite the establishment of the Department of Planning, Monitoring and Evaluation, and the National Evaluation Policy Framework of 2011, monitoring and evaluation remain weak due to institutional challenges such as lack of capacity, resourcing and sometimes the commitment of leadership. The existence of regulative mechanisms is not adequate in institutionalising monitoring and evaluation. The sedimentation of monitoring and evaluation requires the institutional leadership to commit to influencing a shift in culture, behaviour and value systems that are consistent with accountability and transparency. The resourcing of initiatives and activities aimed at promoting monitoring and evaluation of policy reforms and programmes is also critical in building institutional capacity.

Clarifying the roles of key role players

There is no clarity as to who is responsible for driving the digital transformation agenda in South Africa. The Integrated ICT Policy for example vaguely states that the digital transformation of government shall be the responsibility of the Department of Public Services and Administration and the Department of Telecommunications and Postal Services. This has resulted in confusion around the different roles each of the department should play. The risk of

not clarifying roles and responsibilities is that this creates a lack of accountability. Role clarity can also reduce turf wars between role players such as government departments and government agencies.

Appointment of a lead department

The Report of the Presidential Review Commission on the Reform and Transformation of the Public Service in South Africa (1998) recommended that a single agency is assigned the responsibility of leading the digital transformation agenda in government (see Section 7.2.4). These recommendations seem to have fallen by the wayside. The lead department should not only develop policies but oversee or play a role in their implementation. Evidence collected in this study suggests that there is currently no lead department that is driving the digital agenda. The responsibility was instead shared between the Department of Telecommunications and Postal Services and Department of Public Services and Administration (until the recent restructuring).

Appointment of a permanent Government Chief Information Officer

The role of ICT leadership in the digital transformation journey cannot be overemphasised. In South Africa, the lack of leadership in e-government has consequently impacted on IT governance within government (see Section 7.2.3). The successful implementation of reforms requires leadership to provide a vision and lead the development of strategies for supporting implementing of digital transformation reforms. The Government Chief Information Officer is a senior public servant who is accountable and has the legitimate power to lead digital transformation in government as well as monitoring the implementation. The appointment of a Government Chief Information Officer will also assist in bringing stability to structures such as the Government Chief Technology Officers Council whose role is to provide ICT policy advice to government.

Top leadership commitment

The successful development and implementation of policy reforms also require the commitment of top political leadership. The lack of prioritisation of digital transformation policies in South Africa was as a result of a lack of top leadership commitment in the implementation of such reforms. This has consequently impacted the funding of initiatives aimed at promoting the digital transformation agenda. The evidence clearly shows that significant developments in e-government were experienced around a period when South Africa's top political leadership was committed to the digital transformation agenda (see Section 7.2.2). This lack of commitment has impacted the implementation of policy reforms such as the National Broadband, the Cyber Security Bill and privacy legislation such as the POPI Act.

Aligning structures to policies and legislation

Some of the challenges in the implementation of reforms are due to misalignment of structures to policy and legislation. Structures are important mechanisms in the implementation of policies and therefore alignment to policy directives is important. The confusion in roles and responsibilities and delays in implementation of directives are due to misalignment between regulative mechanisms and implementing structures (see Section 7.9.1). This is worsened by delays in updating of policy and legislation to incorporate new developments. Regular update of policies and legislation aimed at promoting the digital transformation agenda should be prioritised to ensure they remain relevant. Supporting structures also need to be aligned with these new developments to ensure they remain effective.

Prioritisation and resourcing

Prioritisation was found to be a key success factor in the implementation of policies. One of the leading causes of failure in the implementation of policy reforms was due to the non-

prioritisation which affected the resourcing, and leadership support and commitment. Prioritisation of policy reforms also needs to go beyond pronouncements on actual policies and legislation but needs to be seen through policy actions as well (see Section 7.1).

8.6.2 Recommendations for policy implementers

Policy implementers are responsible for implementing government policy and national priorities through various implementing agencies such as government departments and their agencies. The Senior Management Services echelon composed of Director Generals, Deputy Director Generals, Chief Directors and Directors in government departments are responsible for overseeing the implementation of policies and national priorities.

Collaboration in the implementation of policy reforms

Collaboration is critical in the successful implementation of transversal policies and programs such as digital transformation. Karlsson et al. (2017:567) reiterated that "collaboration among governmental organisations has been regarded as essential for realizing benefits of government investments". The successful implementation of digital transformation programmes in South Africa requires the collaboration between several departments such as the Department of Public Services and Administration, Department of Telecommunications and Postal Service, Department of Communications and implementing agencies such as SITA (see Section 7.10.7). The infighting and turf wars can also be reduced by developing a framework for collaboration. The intergovernmental relations directorates in the various departments must play a major role in this regard.

Trusting relations

Fostering trusting relations is critical in the implementation of policy reforms as these require collaboration (see Section 7.4.1). Without trusting relations collaboration is a challenge. Trust can also assist in fostering social and political cohesion in institutions. Poor social and political cohesion in the development and implementation of policy reforms was as a result of trust

concerns. Trust concerns were clearly evident between policymakers, policy implementers and other role players such as citizens, private business and civil society. To build trust in institutions requires that institutions become transparent and commit to addressing corruption, poor governance and other issues that have eroded trust in public institutions and their actors. Policy implementers play an important role in building trust as they interact with the citizens and other stakeholders.

Citizen engagement and participation

Citizens are the most important beneficiaries of connected, digitally inclusive and smart governments. This has influenced the shift towards citizen-centric e-government. The successful transition towards smart government relies on citizens' participation and adoption of smart services. To leverage the benefits of smart governments, citizens need to be "smart". A smart citizen is thus a technologically savvy citizen who has access to information and knowledge which they use to make informed choices in participating in social, economic, political and other activities in a smart society. Addressing infrastructure, e-readiness and privacy and security concerns were found to be essential in developing smart citizens. Digital access, digital inclusion and digital readiness are some of the drivers of e-participation. The South Africa government needs to address the current connectivity challenges by accelerating the implementation of the National Broadband (SA Connect) strategy. This needs to be supported by e-readiness programmes for equipping citizens with e-skills to enable them to fully leverage the benefits of smart government services.

8.7 Limitations of the study

This study is a single case of South Africa, a developing country in Africa that has embraced the digital transformation agenda. The study has contributed in narrowing the gap in literature that is largely dominated by literature from developed country contexts. South Africa's contexts, although similar to other developing countries in Africa, is unique in terms of its level

of economic and political development. South Africa, for example ranks high in e-government development in Africa. South Africa alongside Botswana, Mauritius, Namibia, Equatorial Guinea and Gabon is also one of the six countries in Africa considered to be upper middle income countries. This is a limitation as some the findings may not apply in other developing country contexts. There is however an opportunity to conduct similar studies in other developing countries, especially in Africa.

The limitations of the methodology are discussed in greater detail in the methodology chapter 4 (see Section 4.10). Methodological limitations of interpretive case studies such as bias and lack of rigour were minimised in this study through:

- Use of multiple sources of evidence (triangulation) in data collection to enhance the validity of the study's findings as the multiple sources of data enhance corroboration of evidence.
- Use of theory to underpin the qualitative interpretive case study research (Yin, 2009). Institutional Theory and the Circuits of Power Framework were used to guide the research design, data collection process and analysis.
- Peer debriefing (seminars, conferences, symposiums, research supervisor and other information systems academia) were used to enhance rigour. Seven peer reviewed international and regional conference papers and a book chapter were also published.
- A systematic review of the literature to assess the extent to which the findings relate to the existing body of knowledge in e-government was also key in enhancing rigour in this study. A peer reviewed systematic review of literature paper was published in one of the regional conferences.

8.8 Suggestions for future research

Policy development and implementation remain an important topic in e-government despite the growing popularity of citizen-centric e-government where the focus is on the 'citizen'. Without taking away the importance of citizen-centric e-government research, one may argue that it all starts with the development and the implementation of policies that enhance not just government to citizen e-government (G2C) but every aspect of e-government. Good policies also enhance government to government (G2G) and government to business (G2B) practices which consequently benefits citizens through better governance, efficient operations and better service delivery from the government. Some of the research areas that need to be pursued may include:

- The monitoring and evaluation of policy implementation or the institutionalisation of reforms as evident in this study is one area that deserves closer attention. Some of the barriers to e-government integration, interoperability and information sharing were linked to poor monitoring and evaluation. Future studies can explore the role of monitoring and evaluation in the implementation of policy or institutionalisation of e-government reforms in the public sector. There is also an opportunity to introduce non-native theories such as the Theory of Change in e-government studies.

- This study also found that actors in complex institutions such as government play a critical role in the implementation of policy or institutionalisation of reforms aimed at promoting digital transformation. Understanding the roles played by internal and external actors in the transformation of complex institutions such as government, is therefore critical in the successful implementation of reforms. Opportunities exist in integrating stakeholder focused theories such as the Actor-Network Theory or

Stakeholder Theory and Institutional Theory in understanding change or transformation in institutions.

- I would also suggest more studies of transformational projects in e-government to test the proposed Power, Politics and Information Systems Institutionalisation Framework and the Integration, Interoperability and Information Sharing Complexity Framework in other contexts. This is critical in building theory in emerging disciplines such as Information systems and e-government that have often been criticised for lacking theory or not contributing to building theory.

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APPENDIX A: Interview consent form

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

WITS SCHOOL OF ECONOMIC & BUSINESS SCIENCES

NAME: MORE ICKSON MANDA
STUDENT NUMBER: 1238943
PROGRAMME: (PhD INFORMATION SYSTEMS)
RESEARCH TITLE: Towards smart governance through a multidisciplinary approach to e-government systems integration and interoperability and information sharing: a case of the Labour Market Intelligence project in South Africa"

DOCUMENT TITLE: INTERVIEW CONSENT FORM

CONSENT

I..... hereby agree to voluntarily participate in this interview as part of the research study titled "Towards smart governance through a multidisciplinary approach to e-government systems integration and interoperability and information sharing: a case of the Labour Market Intelligence project in South Africa". I understand that I am participating freely and without being forced in any way to do so. I also understand that I can withdraw from participating at any point 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 in the immediate or short term. I understand that my participation will remain confidential and my personal information will not be collected nor used in this study. I also understand that my participation will not pose any risk or loses to me and the organisation I am representing.

.....
Signature of participant **Date:**.....

CONSENT FOR AUDIO RECORDING. I hereby agree to the digital recording of my participation in the study.

.....
Signature of participant **Date:**.....

I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage.

.....
Signature of participant **Date.**.....

.....
Signature of Researcher **Date**.....

School of Economic and Business Sciences, Faculty of Commerce, Law and Management, Private Bag 3, Wits 2050, South Africa
Tel: +27 11 717 8083 | Fax: +27 11 717 8061 | Email: zinhle.kubheka@wits.ac.za | www.wits.ac.za/olm

APPENDIX B: Participant invitation letter

02 February 2017

Dear Ms/Mr.
RE: Request for an interview

My name is More Ickson Manda and I am a PhD (Information Systems) student at the University of Witwatersrand. I am writing this letter to request 60 minutes of your time to voluntarily participate in an interview as part of my PhD (Information Systems) studies. My supervisor is Professor Judy Backhouse from the Wits School of Economic and Business Sciences. I am conducting a research titled: **"**Towards smart government through a multidisciplinary approach to e-government integration, interoperability and information sharing: A case of the Labour Market intelligence project in South Africa". The purpose of the study is to understand e-government integration, interoperability institutional barriers so as to improve the integration and interoperability of e-government systems for promoting a seamless flow of data, information, knowledge and innovation across government departments using a multidisciplinary perspective.

You were selected to participate in this study because of your experience and expertise. The purpose of the interview is to help me gain insight into your personal and organisations' experience, successes and challenges in e-government integration, interoperability and information sharing. The data collected will be used for research and academic purposes only. Personal information of the participants will not be collected and used in this study; the researcher will ensure confidentiality and anonymity of the participants. As a participant you can choose not to answer certain questions or withdraw from the study and nothing will be held against you. Your participation or non-participation in this study will not pose any risk or loss to you. The interview was approved by the University of Witwatersrand Research Ethics Committee (Non-Medical), Protocol Number H15/09/14 and will adhere to the University's strict guide in conducting research.

Thank you in advance. Should you have any questions do not hesitate to contact me contact me on the following:

Phone: xxxxxxx

Email:xxxxxxxx

Supervisor's contact details: xxxxxxx

Supervisor's Phone number: xxxxxxx

Yours Faithfully

More Ickson Manda (PhD research student)

APPENDIX C: Interview guide

Interviewer: More Ickson Manda

Designation: PhD (Information systems) student

Institution: University of the Witwatersrand

INTRODUCTORY REMARKS:

Mr/ Mrs/ Ms/etc.....thank you for taking your time and agreeing to participate in this interview. The information that will be collected will be of great value to this study.

May you kindly briefly describe your role in the organisation?

SECTION A: Background to e-government interoperability, integration and information sharing in South Africa

1. How would you describe the extent of systems integration and interoperability?
2. Describe the information sharing culture and practices in government (G2G e-government)? Is information sharing formalised or at an adhoc basis?
3. May you please describe any significant examples of e-government system integration, interoperability and information sharing initiatives that you are aware of?

SECTION B: Barriers to e-government systems integration, interoperability and information sharing

4. May you please comment on the adequacy of the current e-government strategy and governance framework in addressing e-government systems interoperability and integration?
5. How sufficient is the current legal and policy framework in addressing e-government interoperability, integration and information sharing initiatives in South Africa? Do you consider it as a significant barrier? If so why?

6. Describe the extent of trust, security and privacy concerns in e-government systems interoperability, integration and information sharing in government. Would you consider trust, security and privacy concerns as a significant barrier? If so why?

7. Describe South Africa's technical capability (skills and infrastructure / technology) in driving e-government systems integration, interoperability and information sharing?

8. What other internal and external constraints are confronting e-government interoperability, integration and information sharing initiatives in government?

SECTION C: South African government response to institutional barriers to e-government integration and interoperability.

9. Describe policies and legislation (if any) that have been implemented to improve e-government integration and interoperability? How effective has been the implementation of these policies?

10. Describe (if any) standards and frameworks that have been implemented to enhance integration and interoperability? Please comment on the adequacy and effectiveness of these in addressing the integration and interoperability challenge?

11. What other institutional mechanisms (if any) has the government implemented to enhance integration and interoperability? Please comment on the effectiveness and adequacy of these mechanisms?

12. How are trust, privacy and security concerns being addressed in e-government? Comment on the effectiveness of these measures?

13. How is leadership in government supporting initiatives that have been put in place to promote integration, interoperability and information sharing?

14. What other measures should be put in place in place to promote the successful integration and interoperability of e-government systems?

Thank you very much for your time

APPENDIX D: ETHICAL CLEARANCE CERTIFICATE

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Manda

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H15/09/14**
PROJECT TITLE	Towards an integrated multidisciplinary approach to e-government systems integration, interoperability and information sharing: A case of the labour market intelligence project in south Africa
INVESTIGATOR(S)	Mr M Manda
SCHOOL/DEPARTMENT	Economic and Business Science/
DATE CONSIDERED	18 September 2015
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	01 November 2018

DATE 02 November 2015 **CHAIRPERSON** (Professor J Knight)

cc: Supervisor : Professor J Backhouse

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature **Date** 05, 11, 2015

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES