The Convergence of Information Technology Governance and Digital Technologies to Enhance Performance Capabilities in State-Owned Entities

A

Doctoral Thesis

By

Avrill Mukhithi
10358986

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Supervisor: Prof. M. Phahlane
Co-Supervisor: Dr. L. Malungana

ABSTRACT

This thesis addresses technology governance, digital technologies, and performance capabilities in the context of South African State-Owned Entities (SOEs). These entities are governed by the Companies Act No. 61 of 1973. The Act determines the mandates, functions, and funding mechanisms as well as corporate governance of SOEs. Corporate governance includes information technology (IT) governance. IT governance ensures that technology investments meant to support organizational goals and objectives are acquired and managed to deliver bottom-line results. This thesis argues that IT governance and digital technologies, when appropriately used, can enhance SOEs' performance capabilities. The King IV report stresses that IT governance should ensure IT strategies are in-sync with the business goals and objectives of the SOE. The research problem is that there is inadequate literature addressing how performance capabilities could be enhanced through sound IT governance and the appropriate use of digital technologies.

In addressing the problem, the study was underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT), the Upper Echelon Theory, and the Diffusion of Innovations (DOI). The study followed an interpretivist philosophy using an inductive approach and a case study strategy to unravel how IT governance and appropriate use of digital technologies could enhance SOEs' performance capabilities. The study's unit of analysis was limited to executive and senior management levels. Instead of surveying a broad range of employees or operational personnel, the study concentrated solely on individuals with designations such as Chief Executive Officer (CEO), Director, Chief Information Officer (CIO), Chief Financial Officer (CFO) and Managers. This delineation was intentional: these individuals possess official decision-making authority for the strategic objectives under examination, bear fiduciary responsibility for organisational goals, and serve as the principal gatekeepers for resource allocation. Thus, their perceptions, behaviours, and decisions represent the most accurate and dependable reflection of the organisational phenomena under investigation. Lastly, their perceptions, actions, and decisions serve as the most precise and reliable representation of the organisational phenomena being examined, and the single-SOE case

design facilitated the analysis of how these senior figures exerted agency within the distinct institutional and political framework of the specific SOE.

The study findings suggest that factors significant to enhancing performance capabilities include proper information technology governance and practices, strategic alignment of emerging technologies with organisational goals, and stakeholder engagement for good governance through fostering a culture of innovation and leveraging information technology capabilities. The contributions of this thesis are theoretically, practically, methodologically, and contextually. That is, the original contribution is in the conceptualised framework for IT governance and the use of digital technologies to enhance SOEs' performance capabilities.

KEYWORDS: IT, Governance, Digital Technologies, Performance, Capabilities, SOEs, Strategic alignment, UTAUT, UET and DOI.

PEER REVIEWED PUBLICATIONS FROM THE STUDY

Mukhithi, A., Phahlane, M. and Malungana, L. 2025. Synergising Digital Technologies with IT Governance: A Way to Boost State-Owned Enterprise Performance. In the proceedings of the Walter Sisulu University (WSU) *Multi-Inter-Transdisciplinary Conference on Africa's Transformation Perspectives*. 23 – 25 April, East London. South Africa.

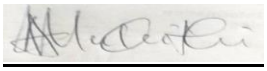
Mukhithi, A., Phahlane, M. and Malungana, L. 2025. Policy Frameworks for Emerging Economies Sustainable Smart City Development: The adoption of AI and IoT for the revolutionization of urban infrastructure development**.** *African Journal of Career Development (AJCD)*. Cape Town. South Africa.

Mukhithi, A., Phahlane, M. and Malungana, L. 2025. Diffusing student performance in using blended learning models in higher learning. Frontiers Media SA. Volume 10 – 2025. Lausanne. Switzerland.

DECLARATION

I, Avrill Mukhithi, student number 10358986, hereby declare that the thesis I am submitting for the Doctor of Information Systems degree at the University of South Africa, titled "The Convergence of Information Technology Governance and Digital Technologies to Enhance Performance Capabilities in State-Owned Entities," is entirely original with full citations to all sources used.

I declare that both the University of South Africa's School of Computing and the organisation that took part in the study provided ethical clearance for the research. I further confirm that the study was conducted entirely in compliance with Unisa's Policy for Research Ethics and that it was carried out with the utmost integrity, keeping in mind UNISA's Policy for Copyright Infringement and Plagiarism.

Signature: 

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ACRONYMS AND ABBREVIATIONS

Acronym	Name
IT	Information Technology
SOE's	State Owned Entities
ITIL	Information Technology Infrastructure Library
COBIT	Control Objective for Information and Related Technologies
ICT	Information and Communication Technology
ISO	International Organisation for Standardisation
CSIR	Council for Scientific and Industrial Research
AGSA	Auditor General of South Africa
PFMA	Public Finance Management Act
SETA's	Sector Education and Training Authorities
CGICTPF	Corporate Governance of ICT Policy Framework
ISACA	Information Systems Audit and Control Association
ESKOM	Electricity Supply Commission
ATNS	Air Traffic and Navigation System
DOI	Diffusion of Technology
UTAUT	Unified Theory of Acceptance and Use of Technology
BBBEE	Broad-Based Black Economic Empowerment
ETDs	Electronic Thesis and Dissertations
STEM	Science, Technology, Engineering and Mathematics
CSS	Corporate Shared Services
ITSM	Information Technology Service Management
PSM	Public Service Commission
SAMEA	South African Monitoring and Evaluation Association
ISMS	Information Security Management System
AI	Artificial Intelligence

IoT	Internet of Things
CFO	Chief Financial Officer
CTO	Chief Technology Officer
CEO	Chief Executive Officer

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.0. Introduction

This thesis explores the convergence of digital technologies and IT governance to enhance performance capabilities in South African State-Owned Enterprises (SOEs). Although technological advancements have made it possible for organizations to enhance their daily operations by streamlining organisational procedures, some organisations are still lagging behind in implementing the newest technologies to enhance their operations. Information and Communication Technologies (ICTs) have assumed a significant role in economic development by strengthening business activities and providing organisations and governments with a fundamental support for effective governance. This study is grounded in the principles and practices of information technology governance, digital technologies, and performance capabilities.

Previous studies have focused on information technology (IT) governance and its significant contribution to organisations for solving problems, while providing intellectual capabilities through computational tools (Mikalef, Pateli, and van de Wetering, 2021). However, the impact of emerging technologies on organisational efficiency and effectiveness and the challenges of implementing IT policies with a particular emphasis on optimising IT governance in State Owned Entities (SOEs) during digital transformation is inadequately addressed. For instance, South African SOEs apply technological methodologies similarly to the private sector, although with some shortcomings. The public sector and its entities implement governance processes to streamline information technology operations.

This introductory chapter entails the following sections: 1.1. This section provides the background to the studied field. It articulates the evolution of IT governance as a discipline focused on maintaining control and compliance over IT assets and its development into a crucial strategic area, especially in the intricate world of state-owned enterprises (SOEs). 1.2. Background to the research problem. This section presents the motivation to study the pressing challenges by examining the precise mechanisms

that can be used to coordinate the purposeful convergence of digital technologies and IT governance. The identified knowledge gaps are provided. 1.3. Motivation for a contextualized IT governance and digital technologies framework for performance capabilities. 1.4. Problem statement problematises the problem relative to these identified knowledge gaps. 1.5. Research questions. This section articulates research questions that directed the present study. 1.6. Research goal, purpose, and objectives. This section elucidates the purpose of the study. 1.7. Research argument. This section elucidates how South African State-Owned Enterprises (SOEs) face widespread performance issues that stem from a fundamental gap between governance and technology, rather than just individual governance failures or a lack of technology. 1.8. Study delineations. This section covers the scope of the study. 1.9. Significance of the study. This section articulates both theoretical and practical contributions. 1.10. Summary of the chapter. 1.11. Thesis structure. The thesis is organised into seven consecutive chapters that methodically handle the research problem.

1.1. Background to the Field of Study

This part offers a thorough examination of the fundamental concepts that support the current study, starting with an analysis of how information technology governance is articulated. In this context, governance is regarded not as a singular policy but as a dynamic process that explicitly articulates an organization's strategic goal via its IT capabilities. The assessment especially situates this within State Owned Entities (SOEs), where governance is uniquely complex by dual accountabilities to economic viability and public-sector responsibilities. Thus, the discourse differentiates between regular IT management (the operational maintenance of systems and networks) and strategic IT investments (the long-term capital allocation for digital infrastructure). This distinction is crucial because, in state-owned enterprises, investment decisions frequently undergo rigorous examination of public value, necessitating governance procedures that are both transparent and adaptable. The section subsequently categorizes IT governance operations into decision-rights structures (who makes decisions), control mechanisms (how decisions are overseen), and communication protocols (how results are conveyed). In this classification, the function of IT is redefined: instead of being a passive

resource to be managed, IT is regarded as an active contributor to governance, supplying data streams and analytical tools that facilitate real-time supervision and risk management.

1.1.1. IT Governance

Landau (2023) defines IT governance as a set of guidelines and processes that are implemented to ensure that all the IT activities of an organisation are geared towards the achievement of its business goals. These IT activities include how IT teams are structured, the procurement of IT assets, and the configuration of IT infrastructure.

A study by Tian and Chen (2022) emphasises that the main desired outcomes from implementing IT governance in any given organisation are typically to ensure business value is generated by information technology, overseeing the performance of IT managers, assess risks associated with the IT department, and establish an IT disaster recovery plan to provide transparency and accountability to IT operations. Defining IT project management standards and overseeing the financial management aspects of IT, such as capital budgeting and spending, ensures IT compliance with laws and regulations and defines standards for current IT audits to meet the IT needs of different departments of an organisation. IT governance is a subset of corporate governance, which has its own collection of processes that are designed to keep the entire corporation effective and efficient.

In South Africa, the Companies Act (No. 61 of 1973) governs State Owned Entities (SOEs). This legislation provides for the establishment of the SOE, which further determines its mandate, functions, and funding mechanisms. IT governance is one of the most critical elements of corporate governance aimed at improving IT management and further ensuring that IT investments support organisational goals and objectives by delivering bottom-line results. IT governance can assist SOEs in improving their performance by providing opportunities to enhance organisational processes, systems, and practices by ensuring that IT strategies are in sync with the goals and objectives of the organisation. There are King Reports that solely focus on corporate governance with guidelines for government structures and companies' operations in South Africa. The first King report King I, was issued in 1994, and later followed by King II in 2002, and the third King, which further incorporated

aspects of IT governance with the expectation to become more effective, was issued in 2009, and the last report King IV, was issued in 2016. Although the King IV report stresses the importance of IT governance, there is limited research on the criticality of State-Owned Entities having suitable IT investment in place for IT governance and digital technologies, which will allow them to disseminate the performance information to stakeholders.

The government institutions should understand the information technology (IT) governance procedures and policies to be adopted. The need to adopt the current ITIL framework in information technology departments, COBIT, and the information technology standards such as ISO/IEC38500, which are the latest version cannot be discarded as it easy to adapt and adopt it. It has been noted that some of South African SOEs and government departments are not following these frameworks henceforth there are different programs in different department and there is no alignment. Even though the standards are made for streamlining the processes, in South Africa service delivery continue to persist which later result in poor performance.

The importance of IT governance should be seen as one of the critical factors in the successful running of businesses and organisations (Wilkin and Chenhall, 2020).

1.1.2. State Owned Entities

Nxozi and Flowerday (2021) defines SOE's as public entities defined in the Public Finance Management Act (PFMA) which include government business enterprises, more commonly known as state-owned enterprises. These SOEs are independent entities partially or fully owned by the state to achieve the various socio-economic goals of government. They are expected to fulfil a dual commercial and developmental mandate. Most of these SOEs have a direct impact on the lives of citizens through the services and infrastructure they provide. Poor governance, mismanagement, fraud and corruption claims and a lack of financial sustainability at some of the SOEs have been in the spotlight for the past few years, attracting attention as taxpayers' money is used to sustain the failing SOEs. As this narrative contributes to the loss of public confidence in the ability of the state to govern and oversee these SOEs. Some are audited by private audit firms in accordance with the

directives provided by government using its methodology for auditing compliance and performance information. These audit firms are appointed by the boards of the SOEs (AGSA report, 2016-17).

A study conducted by Milakovich (2021) highlights that the explosive growth of technology is forcing businesses and organisations to reinvent themselves to effectively compete in the digital economy. Furthermore, despite the limited resources in terms of technology, Tanzania is a developing country that addresses issues related to technology with limited resources and infrastructure. To help close the gaps in IT governance, the government must prioritise investments in IT infrastructure and establish a stronger regulatory framework. Thus, as a result of the absence of thorough regulations and enforcement systems. The Tanzanian government is failing to acknowledge the importance of information technology for the future expansion of public organisations and effective governance. This is leading to work duplication, slowing down the digital transformation of SOEs and negatively affecting overall IT management and service delivery, government systems' vulnerability to cyberattacks, and operational efficiency. Based on these limitations, there is optimal use too in Zambia, which is witnessed and is similar to the Tanzanian study. A study by Kala (2023) states that ICT presents a technological advancement that results in technological competition. Also, the existing literature on this topic is limited and lacks a theoretical framework that adequately represents the perspective of the end user. It has become significant that, situational environment is based on an array of challenges, difficulties, and advantages that may or may not influence the acceptance of innovation (Arnold, 2022; Parks, Srinivasan and Aragon, 2022).

1.1.3. Corporate Governance

King IV Steering Point (2016) defines Good corporate governance as a requirement of an acknowledgement that an organisation doesn't operate in a vacuum but is an integral part of society and therefore has accountability towards current and future stakeholders. With the introduction of an 'apply and explain' regime, King IV asks organisations to be transparent in the application of their corporate governance practices. King IV reinforces the notion that good corporate governance is a holistic and interrelated set of arrangements to be understood and implemented in an integrated manner – good governance is not a tick-box or compliance exercise. King IV asks for mindful

application of its code and for its recommended practices to be interpreted and applied in a way that is appropriate for the organisation and the sector in which it operates. Mindful application harnesses the benefits of corporate governance in the interests of the organisation.

To assist organisations in implementing frameworks and policies, the adoption of the Information Technology infrastructure library (ITIL) framework is recommended. Therefore, companies and government institutions should embrace the presence of IT infrastructure as well as application services to facilitate the functional management of data (Wang, Zhong and Li, 2022). To support the existence of these frameworks, the British government introduced ITIL, which dates to the 1980s, and primarily focuses on guiding organisations in delivering high-quality IT services. IT frameworks such as Control Objectives for Information and Related Technologies (COBIT) and Information Technology Infrastructure Library (ITIL) will bring a significant contribution to organisations through IT governance which will be premised within information systems. The COBIT framework, created by the Information Systems Audit and Control Association (ISACA) in the mid-1990s, facilitates the synchronisation of business objectives by ensuring that information technology activities conform to and support the strategic goals of the organisation. It also offers direction for complying with government regulations, policies, and effectively managing risks associated to information technology.

1.1.4. Strategic Alignment

Strategic Alignment' as the appropriate use of information technology in the integration and development of business strategies and corporate goals. In essence, four sets of decisions by an organisation - on business strategy, IT strategy, business infrastructure and IT infrastructure - need to be coordinated or aligned (Garg et al, 2001). Proper alignment of organisational goals with IT objectives will assist in integrating Information Technology (IT) governance and Digital technologies to improve performance capabilities in SOEs. Having controls in place as a measure to mitigate any risks that may occur through implementation of IT governance frameworks as a guide to align IT investments to improve the organisational performance.

Strategic alignment the intentional and dynamic integration of key business components into a coherent and synergistic whole is essential to attaining and maintaining organizational success in today's quickly changing and fiercely competitive environment. Thus, it calls for a comprehensive strategy in which governance frameworks serve as the crucial scaffolding that directs and regulates strategic intent rather than just being administrative roadblocks. And therefore, ensures that investments in transformational digital technologies are made with a specific goal in mind. In turn, these technologies need to be used to develop and improve certain performance characteristics that provide real value, not only for their own sake. Convergence is the ultimate ideal, when strategy, governance, technology, and operations are no longer separate departments but rather a one engine that propels the company effectively toward its objectives, allowing for adaptability, resilience, and a clear competitive edge.

1.1.5. Digital Technologies and Performance capabilities

Khin and Ho (2019) emphasize that although digital technologies are a basic enabler of improved performance capabilities, their influence is neither direct nor automatic. The fundamental tools to significantly increase operational efficiency, enable data-driven strategic decision-making, and promote creative service delivery are provided by technologies including cloud computing, data analytics, and IoT platforms. However, these technology resources can only result in long-term performance capabilities if they are properly matched with organizational objectives and successfully incorporated into essential business operations. In order to achieve strategic agility and a strong competitive advantage in a dynamic environment, the business must enhance critical competencies including response time, insight quality, and service personalization.

These technologies enable transformational performance capabilities that completely alter business paradigms, going beyond simple optimization. Predictive maintenance and dynamic resource allocation are made possible by real-time data processing and the Internet of Things (IoT), shifting operations from a reactive to a proactive position. Innovation cycles are accelerated by seamless

international collaborations made possible by sophisticated collaboration tools and unified communication systems (Bag et al. 2025).

1.2. Background to the research Problem (motivation for the study)

The research problem's background is provided in this section. This covers IT governance concerns and challenges, as well as the study location and context. The foundation and motivation for the present study are provided by the identified knowledge gaps.

1.2.1. Study location and Context

The study was conducted within the context of South Africa's significant and transformative State-Owned Enterprises (SOEs). These are pivotal, government-owned entities operating in strategic sectors of the national economy such as energy (ESKOM), logistics and transportation (TRANSNET), defense (DENEL), and aerospace and technology. The empirical study location was one of the premier South African SOE headquartered in Pretoria and with several campuses and facilities throughout the country.

Unlike many SOEs that focus on direct service delivery, the selected SOE operates inside the national innovation system, serving as a major hub for multidisciplinary research, development, and innovation. Therefore, the present study location was more than just a physical place; it was a distinct organizational ecosystem inside the SOE landscape, one with a mandate to promote scientific and technology innovation for socioeconomic prosperity. By purposively selecting the SOE as a location, the study placed itself within a dynamic, knowledge-intensive SOE where the interaction of public sector mandates, cutting-edge scientific inquiry, and commercial application could be critically

examined, providing a unique lens through which to understand the challenges and opportunities confronting South Africa's strategic public institutions.

The funding models for South Africa's State-Owned Enterprises (SOEs) are directly linked to their classification, ranging from total fiscal dependency to commercial self-sufficiency. At one end are non-commercial public entities, including Constitutional Entities (such as the IEC) and various Schedule 3A National Public Entities (such as regulatory bodies and research institutions); these entities are predominantly or entirely financed through annual parliamentary appropriations and transfers from the National Revenue Fund, as they execute essential governmental functions that are not designed for profit generation. Conversely, Government Business Enterprises (GBEs) or State-Owned Companies (SOCs) are anticipated to function according to business principles and produce revenue through their commercial operations. These encompass significant strategic entities such as Eskom and Transnet (designated as Schedule 2 Major Public Entities), which, in principle, ought to be self-sustaining through operational revenues and capital markets; nonetheless, they often depend on a combination of commercial debt (frequently backed by government guarantees), direct fiscal assistance, and equity infusions due to financial turmoil, rendering them substantially dependent on the state's balance sheet despite their commercial mandate. businesses such as Financial Intermediaries and other Schedule 3B/3D entities, situated between these extremes, possess restricted borrowing capabilities and may amalgamate commercial earnings with some government transfers to achieve specified developmental goals or services. This framework indicates that the funding methodology differs markedly, with non-commercial divisions being directly financed by the budget, whereas commercial institutions are intended to be self-sustaining but sometimes necessitate considerable governmental support, usually via state guarantees.

Miles (2019) asserts that in South Africa, public entities are categorised for management purposes into Schedule 2 Major Public Entities (e.g., ESKOM, ATNS, DENEL) and Schedule 3 Other Public Entities, which are further subdivided into national, provincial, and different categories such as Sector Education and Training Authorities (SETAs) or government business enterprises, as stipulated by the Public Finance Management Act (PFMA). The categories depend on characteristics such as whether

the entity is a national government business enterprise, a national public entity, or a provincial entity, with Schedules 3A and 3C entities serving as prevalent examples.

The State-Owned Entities (SOEs) contribute to the SA economic growth through various sectors telecommunications and infrastructure development, amongst others. Moreover, the current various sectors of telecommunications, infrastructure development, and transportation amongst others benefit the country's growth. Notwithstanding that, technology is growing rapidly and plays a pivotal role in driving efficiency, innovation and competitiveness. Information and Communication Technology (ICT) allow the SOEs to operate through enhancement of quality services regarding information which is provided for improvement functions. Debande and Ottersten (2004) supported the role of ICT as an arrangement of industrialized services that convey and demonstrate information by electronic means.

In 2012, the South African government released a Corporate Governance of ICT Policy Framework (CGICTPF), which draws upon COBIT5, ISO38500, and the King IV report. The primary objective of the Framework is to enhance IT governance, which is a fundamental component of the organisation. Additionally, the Auditor General of South Africa (AGSA) observed that a considerable number of its auditees exhibited inadequate IT governance controls during the 2018-19 financial year, leading to subpar performance. Nxozi and Flowerday (2021) discovered that inadequate implementation of these controls results in excessive irregular, fruitless, and wasteful expenditure. Therefore, IT governance has become important for enhancing organisational performance through five essential capabilities: digitised administration processes, public intelligence analytics, inter-organisational system integration, online public interactive interfaces, and public information dissemination.

1.2.2. Challenges and issues observed

In South Africa, the significance of IT governance remains key facilitators of organisational performance and should be recognised (Larionova and Shelepov, 2021; Masilela and Nel, 2021; Galushi and Malatji, 2022; Soga, 2022). Government and institutions must be prepared to embrace

the present inventive transformations to incorporate IT advances that can support the organisations' daily operations. Therefore, the South African public sector and its SOEs should establish operational principles and a common set of values that guide policy to fully use the existing technology and incorporate changes offered by new technologies for more innovative service delivery management. Mophethe (2023) argues that the reformation of SOEs is crucial for the government. However, there are drawbacks associated with this reform, including inadequate skilled personnel and ethical standards that hinder efficient and effective operation. Furthermore, Tian and Chen (2022) emphasise that entities are not conducive to improving the country's economy, when issues such as ethical standards are not being addressed. Tian and Chen (2022) further argue that the State-Owned Enterprises (SOEs) might become a burden in any economy of a country, if its core principles and practices are not in line with the organization's goals, strategies, and risks; having the right resources and positioning; exhibiting quality and ongoing progress; being proactive, perceptive, and future-focused; and encouraging organizational development. These lead to the identifying knowledge gaps discussed below:

1.2.3. Research Knowledge gaps and Study Motivation

The IT governance of the South African SOEs lacks in certain areas. Since IT has also become essential to organization's activities, IT governance's efficacy and sufficiency should be assessed and enhanced. Through the development of an IT governance framework for South African state-owned enterprises (SOEs), the current study fills in the current knowledge gap. The report adds new information about IT governance in state-owned enterprises (SOEs) in South Africa.

There are challenges that are experienced due to poor network infrastructure and lack of resources which lead to barriers to implementation. As a result, negative effects cannot improve productivity, efficiency, skills transfer and other immense opportunities through its innovative platforms. Contrary to that, positive impact of IT governance can exist in SOEs for service delivery by driving citizen participation, engagement and transparency. Therefore, this is one of the most pivotal conduits in driving IT advancement as discovered by Matthews & Landsberg (2022). Additionally, alignment

of service delivery and the use of technology will result in service delivery within the South African SOEs.

1.2.3.1. Gaps in theoretical knowledge

Failing to triangulate theories inevitably results in knowledge gaps since it limits the analytical perspective to the limited and frequently singular explanatory power of a single theoretical lens. While this method reveals certain features, it inevitably casts vast areas into shadow, missing the complex interactions, contradictions, and multifaceted nature of the phenomenon. Triangulating theories bridges this gap by actively integrating various, and sometimes competing, theoretical frameworks to produce a thoroughly contextualised theoretical model that explores the subject from several diverse aspects concurrently. To improve the theoretical knowledge already available in the context of IT governance, the current work triangulates three theories. As shown in chapter 3 overview of related studies, the Upper Echelon theory, the Diffusion of Innovation (DOI) model, and the Unified theory of Acceptance and Use of Technology (UTAUT) are thought to be the best explanations for why IT governance is necessary. Poor IT governance exposes the organisation to unnecessary potential risks and system failures that can be prevented.

On the basis of the above paradigm, Tian and Chen (2022) asserts that instead of just adding viewpoints, this synthesis produces a dynamic analytical tension in which the advantages of one theory balance out the disadvantages of another, enabling a more comprehensive and reliable interpretation. Lack of such a contextualized framework poses a serious risk as it forces the empirical world's complicated and frequently chaotic reality. This leads to a skewed understanding as the case's distinctive historical legacies, institutional logics, and local circumstances are not theorized or explained, leaving a crucial knowledge gap regarding the reasons behind events in that particular setting and the ways in which different contextual factors interact to produce the observed results.

Matthews & Landsberg (2022) posit that IT governance should not only be seen as an operational enabler but an integral part of the organisation which supports, sustains and grows it by ensuring the information technology objectives that are aligned to the organisational goals and sound as

technology investments are made for good governance. Prudent steps and well-tailored IT governance should be taken with respect due to its criticality in ensuring effective and efficient SOE's operations. This has been supported by Msimanga (2021) that information technology promotes accountability in the e-government spheres and enhances citizen participation in governance decision-making processes.

Considering the above, Mailane (2021) explains that IT strategies can bring technological change that is essential to support the goals and objectives of the government as part of the National Development Plan. Appropriate IT investment is critical to achieving NDP goals and supporting sustainable development goals. Thus, there needs to be an IT strategy that mainly focuses on digital skilling, process automation, system integration, information and knowledge management. The SOE's mandate as per the Public Finance Management Act (PFMA), which is regarded as a guideline for managing the governmental funding and its parastatals. Significantly, the PFMA is seen as the guideline, policies and processes which is visible, transparent, fair, equitable and competitive as regarded by the Auditor General South Africa (AGSA) general report for (2016-17).

1.2.3.2. Gaps in practical Knowledge

For management at State-Owned Entities (SOEs), the intersection of digital technologies and information technology governance creates a crucial "know-what" gap. The theory of IT governance frameworks such as COBIT or ITIL, as well as the concepts of digital technologies like cloud computing, data analytics, and the Internet of Things, are concepts that many executives and IT managers are familiar with. They don't, however, have a clear, useful grasp of what this convergence actually means or ought to look like in their particular, rather inflexible public-sector setting. They have trouble coming up with a cohesive strategy plan that transcends divided IT initiatives and adopts an integrated digital operational style.

This lack of a clear target model knowing what a truly governed digital system should be leads to fragmented initiatives where strong governance is seen as impeding digital innovation, or, on the

other hand, where digital adoption occurs in an uncontrolled, ad hoc fashion, posing serious risks to public accountability and performance.

Moreover, a significant "know-how" gap hinders execution even when the strategic "know-what" is established. Board members and IT teams are examples of practitioners lacking the practical, hands-on skills necessary to successfully coordinate this convergence. This includes a lack of expertise in implementing automated governance controls within digital platforms, an inability to modify standard IT governance frameworks to regulate agile development cycles, and a lack of understanding of how to gauge the performance impact of governed digital investments.

Luna-Reyes, Juiz, Gutierrez-Martinez and Duhamel (2020) emphasised that the need to adopt the current ITIL framework in information technology departments, COBIT and the information technology standards such as ISO/IEC38500, which are the latest version cannot be discarded as it is easy to adapt and adopt. It has been noted that some of the South African SOEs and government departments are not following these frameworks; henceforth, there are different programs in different departments and there is no alignment. Even though the standards are made for streamlining the processes, in South Africa, service delivery continues to persist, which later results in poor performance.

The government institutions should clearly understand the information technology (IT) governance procedures and policies to be adopted. Luna-Reyes, Juiz, Gutierrez-Martinez and Duhamel (2020) emphasised that the need to adopt the current ITIL framework in information technology departments, COBIT and the information technology standards such as ISO/IEC38500, which are the latest version cannot be discarded as it is easy to adapt and adopt. Therefore, It has been noted that some of the South African SOEs and government departments are not following these frameworks; henceforth, there are different programs in different departments and there is no alignment. Even though the standards are made for streamlining the processes, in South Africa, service delivery continues to persist, which later results in poor performance.

1.2.3.3. Gaps in methodological Knowledge

Denzin and Lincoln (2018) postulate that the natural sciences serve as the foundation for positivistic research, which places an emphasis on generalization, objectivity, and the discovery of causal laws or correlations. They accomplish this by purposefully removing subjective meaning and context, turning complicated human processes into measurable quantities. The outlay of this methodological rigor is that it omits the rich, in-depth explanations of the "why" and "how" of the associations that have been found. Strong IT governance, for example, may be successfully linked to improved financial performance in State-Owned Entities (SOEs) by a positivist survey. However, positivistic surveys are unable to explore and describe how managers understood the governance policies, how they supported or opposed them, or what the contextual barriers were within the SOE's political environment. This leads to a superficial, decontextualized understanding that pinpoints a "what and how" but falls short of offering the depth required to completely grasp the subtleties and underlying mechanics of the phenomena.

On the other hand, interpretivism is predicated on the idea that human interactions, meanings, and interpretations shape social reality rather than it being a set, objective truth. Because its main goal is to investigate and characterize these highly subjective meanings within their context, it is therefore better suited for comprehending complex organizational processes as alluded by (Bryman 2016). By exploring the experiences, convictions, and motivations of the participants, interpretivism aims to comprehend diverse realities rather than a single universal reality. To provide the crucial details that positivism leaves out, an interpretivist approach would not merely record that a policy was put into place; rather, it would investigate how various practitioners understood the policy, how it altered their daily routines, and how the local organizational culture influenced its application.

This philosophical difference is evident in the decision between a case study, which is frequently interpretivist, and a survey, which is frequently positivist. A positivist study is best suited for a survey approach since it measures variables and extrapolates results to a larger population by using standardized tools to gather data from a large sample. The "what" and "how" questions are addressed (Gulati et al., 2023). However, interpretivism is particularly well-suited to a case study approach. It

offers a comprehensive, context-dependent, and extensive analysis of one or a limited number of examples in their actual surroundings. A case study reveals the intricate network of social, cultural, and historical elements that a survey would unavoidably overlook by using techniques like observations and interviews to produce the detailed description required to address "how" and "what" questions.

As mentioned in chapter 3, prior research on IT governance has made use of the Unified Theory of Acceptance and Use of Technology (UTAUT), Upper Echelon Theory and Diffusion of Innovation (DOI) model. However, rather than offering detailed descriptive information on the phenomenon under study, quantitative research primarily examines ideas to ascertain the field's applicability in certain domains. To bridge the methodological knowledge gap, the present study used a qualitative case study research approach to better understand IT governance and how combining IT governance with digital technologies can enhance performance capabilities in South African state-owned entities.

1.2.3.4. Gaps in contextual knowledge

The fundamental knowledge gap regarding the convergence of digital technologies and IT governance in South African State-Owned Entities (SOEs) is profoundly contextual rather than merely technical. The "where", “who”, and "when" of this phenomenon are crucial: As these organizations function in a post-apartheid South Africa feature distinct socio-economic imperatives such as addressing historical injustices (Broad-Based Black Economic Empowerment), intense public scrutiny, political meddling, and the persistent problem of corruption. This unique reality is not considered by applying general, internationally generated models and theories, which are frequently created in the stable, well-resourced contexts of industrialized nations. Therefore, the knowledge gap is the absence of a contextualized understanding of how these South African pressures from the need for social reparation to the legacy of previous corruption directly influence, facilitate, or impede the successful integration of digital transformation and government.

The importance of IT governance should be seen as one of the critical factors in the successful running of businesses and organisations (Wilkin and Chenhall, 2020). It has been noted that there are still critical challenges and barriers to implementing effective information technology governance strategies tailored to ensure compliance and safeguard against any emerging risks. Ma (2020) further asserts that the imperative need for aligning information technology innovation and organisational performance comes with an increased awareness of the potential impacts of Information and communication technology (ICT). The present study explores and describes identified key factors that may restructure the implementation of information technology governance with digital technologies frameworks in state-owned entities (SOE's) to meet their policy objectives, improve performance and associated obligations.

1.3. Motivation for a contextualized IT governance and digital technologies framework for performance capabilities

Existing literature does not provide a framework contextualised to the uniqueness of South Africa and its SOEs. Therefore, there is a need for a contextualized IT governance framework for digital technologies in State-owned entities (SOEs) to adequately address the complex and specific realities that these institutions operate in. SOEs are more than just big businesses; they are tools of state policy, tasked with both establishing commercial viability and advancing socioeconomic development. Standard international frameworks like COBIT or ITIL primarily target the comparatively stable, profit-driven environments of private multinational corporations. Uncritical application to SOEs results in a large "fit-gap" since it fails to take into account the considerable impact of contextual factors including political meddling, outdated procurement processes, resource limitations, and the need for widespread empowerment.

The lack of information technology objectives not being aligned to the strategic goal of the organization is not centralized for governance in the running of the business. As the emerging technologies should be used for the benefit and their impact on the organisational performance (Corporate Governance Series, 2010). However, the existence of King IV Steering Point (2016) should focus on reporting on proper implementation of the IT governance framework, which covers

both operational and strategic goals. Additionally, information technology includes an accountability framework, reporting, a charter, policies, and decision-making structures that are of the utmost importance in the efficiency and effectiveness of the organisation. Thus, having an internal control framework for information technology will ensure the organisational achievements towards its objectives and a good management of IT-related risks.

1.4. Problem Statement

IT governance ensures that digital technology investments meant to support organizational goals and objectives are acquired and managed to deliver bottom-line results. The problem is that IT governance and digital technologies are not appropriately used to enhance SOEs' performance capabilities. King IV report stresses that IT governance should ensure that IT strategies are in-sync with the business goals and objectives of the SOEs. The research problem is that there is inadequate literature addressing how performance capabilities could be enhanced through a sound IT governance and the appropriate use of digital technologies. Despite the issuing of King Report and King Code of Governance Principles in 2009 by the South African government, there is lack of governance and digital technology practices and policies in SOEs which negatively affects organisational performance and the achievement of strategic objectives. It has been noted that there are still critical challenges and barriers to implementing effective information technology governance strategies tailored to ensure compliance and safeguard against any emerging risks. Thus, there is an imperative need for aligning information technology innovation and organisational performance, which comes with an increased awareness of the potential impacts of digital technologies and capabilities. To this point, the present study explored and described critical aspects of IT governance and the use of digital technologies to enhance performance capabilities, through a contextualized framework for South African state-owned entities.

1.5. Research argument

The persistent underperformance of many State-Owned Entities (SOEs) in South Africa is a strategic problem rather than just a financial or technical one. It stems from a fundamental misalignment between their IT governance models and the transformative potential of digital technologies. The present study argues that context is key in information systems research, therefore, the agility and innovation needed in the digital economy cannot be fostered by a traditional, compliance-oriented approach to IT governance. This leads to a major capability gap, whereby investments in cutting-edge technologies are impeded by bureaucratic procedures and do not result in better public service delivery or operational performance. Therefore, the approach to long-term progress is not to pursue either improved technology or better governance separately, but rather to intentionally and strategically combine the two, in the context of South African SOE realities. The present study contend that for SOEs to overcome their operational challenges and ultimately fulfil their public mandates in a resource-constrained environment, IT governance needs to be reimagined as an enabling framework that actively coordinates and accelerates digital technology adoption and use.

1.6. Research goal, purpose, and objectives

The purpose of the study was to explore and describe IT Governance and digital technology use to enhance performance capabilities, in the South African SOEs context.

1.6.1. Study goal

The study goal was to conceptualise an IT governance and digital technologies framework to enhance performance capabilities, in the context of the studied South African State-Owned Entity.

1.6.2. Study Objectives

1. To explore and describe information technology governance practices for optimising resource allocation and utilisation of IT functions in SOEs.

2. To describe information technology governance and digital technologies strategy of SOEs to closely align with overarching objectives and priorities, in operational processes.
3. To describe how innovation can be used to leverage information technology capabilities for new business opportunities, improving service delivery, and enhancing performance capabilities.
4. To determine how performance capabilities could be enhanced by IT governance and the use of digital technologies, in the context of South African SOEs.

1.7. Research questions

The primary research question was, *How should IT governance and the use of digital technologies converge to enhance performance capabilities, in the context of the studied South African State-Owned Entity?*

The secondary research questions:

1. How is IT governance practised in SOEs for optimising resource allocation and utilisation of IT functions?
2. How does information technology governance and digital technologies strategy of SOEs closely align with overarching objectives and priorities, in operational processes?
3. How does innovation leverage information technology capabilities for new business opportunities, improving service delivery, and enhancing performance capabilities?
4. How can performance capabilities be enhanced through IT governance and the use of digital technologies, in the context of South African SOEs?

1.7. Study delineations

The study focused on a singular state-owned entity in South Africa to qualitatively investigate how IT governance and digital technologies could enhance performance capabilities, although these capabilities were inferred rather than directly assessed. The study did not analyse particular information systems or applications in depth, but rather utilized governance frameworks such as COBIT, ITIL and ISO as interpretative tools. Although the results may provide valuable perspectives for other state-owned entities, the cross-sectional approach confined to a single entity and moment in time restricts the evidence to a particular context and timeframe, without the longitudinal depth necessary to monitor change or determine causality.

1.9. Significance of the study

In Information Systems research field, context is key to unravelling and understanding the adoption, use, and impact of technologies. The present study contributes to both theoretical knowledge and practical knowledge by providing invaluable insights with respect to information technology governance, the use of digital technologies to enhance performance capabilities, and in the context of South African state-owned entities. With the context-sensitive conceptualised framework, the study may inform practice and academia by helping with decision-making process, how SOEs could improve organisational effectiveness and performance, which may ultimately contribute to the socio-economic development of the country relying on SOEs as one of the key drivers of growth and development. That is, the significance of the present study is in bridging the identified knowledge gaps.

1.10. Summary of the chapter

This chapter introduced the thesis by briefly introducing the field studied and giving the background to the research problem and the motivation for the study. The chapter discussed the purpose and the goal of the study. It provided the objectives and the research questions that drove the present study.

The chapter ended by outlining the delineations and how the study is significant to information systems research field.

1.11. Thesis structure

The rest of the thesis is arranged as follows:

Chapter Two: provides an extensive analysis of existing literature that give the present study a theoretical foundation. The chapter discusses related works in digital technologies, IT governance, organizational performance capabilities, and state-owned entities.

Chapter Three: discusses the underpinning theories and provides the conceptual research framework that guided the study.

Chapter Four: describes the research methodology followed in conducting the study. It discusses the chosen research philosophical paradigm, approach, strategy and design.

Chapter Five: analyses the empirical evidence and discusses the study findings

Chapter Six: interprets the study findings and provides the conceptualized framework

Chapter Seven: evaluates the research and articulates the thesis contributions

CHAPTER TWO: SURVEY OF SCHOLARSHIP AND THEORETICAL FOUNDATIONS

2.1 Introduction

This chapter surveys the scholarship by reviewing existing literature that gave the present study a foundation. The relevant key concepts are reviewed. The following is an outline of this chapter: 2.2. Systematic literature review of key concepts, 2.3. discusses practice frameworks such as COBIT, ITIL, ISO, and lastly, Related works are discussed.

2.2. Systematic literature review of key concepts

This chapter cites a total of 106 previous studies. A systematic literature review approach was employed in this chapter, drawing from a variety of articles found in the Google Scholar and Sabinet databases. The table below highlights the significance of strong governance frameworks and the difficulties encountered in their implementation by incorporating a wide range of journals that offer insights into IT governance, digital technology integration, and their implications for state-owned enterprises. The analysis highlights that in order for SOEs to match their technology investments with strategic goals, good IT governance is crucial. To maximize returns on IT investments and ensure that they serve the organization's overarching objective, this alignment is required. Examining successful case studies where the combination of digital technology and IT governance has enhanced SOE's performance is the goal of the literature research. Furthermore, examining current frameworks and procedures is part of this in order to provide policymakers and SOE leaders with recommendations.

2.3. PRISMA Flow Diagram

Literature search of the Sabinet Database and Scholar.google.com. Search words used included IT governance, digital technologies, public entities, performance, capabilities.

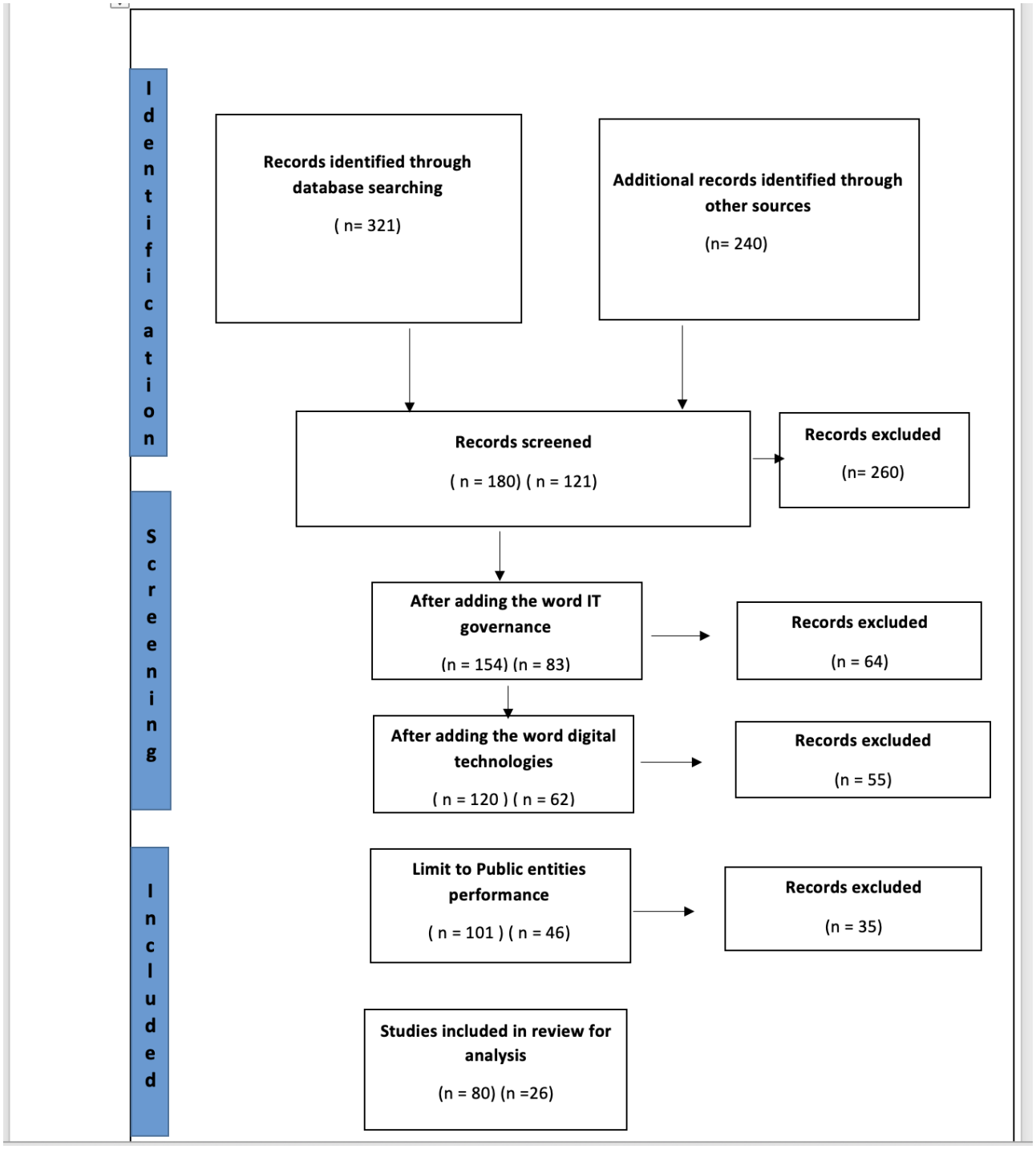


Figure 2.1: Searching literature in Sabinet database and Google Scholar.

A review of several studies were downloaded and examined per Table 2.1. Analysis of these studies is given in the following table.

Table 2.1. Review of previous studies on key concepts

Author	Methodology	Findings	Key contributions	Limitations
Wu et al. (2023)	Empirical study	Digital transformation aids in achieving high-quality development and further produces improved performance.	Highlights the importance of digital transformation in enterprise success by exploring the impact of IT for organisational performance.	Context may be limited to Chinese listed companies as it only focuses on them.
Jiapin (2023)	Conceptual analysis	Importance of IT governance structures for achieving organizational goals.	Elucidates the value of IT governance in enhancing performance.	Lack of empirical validation.
Milakovich (2021)	Literature review	Strong IT governance frameworks enhance SOE performance.	Discusses the synergy between digital technologies and governance.	May not address specific challenges faced in different regions and countries.
Dincă et al. (2019)	Quantitative study	Digital technologies improve	Identifies determinants of	Focused on Romanian SMEs,

		decision-making in businesses.	cloud computing adoption.	which does not generalize to SOEs.
Ali et al. (2021)	Survey	IT governance impacts organizational performance in the public sector.	Mediating effect of innovation on governance and performance.	Limited to Pakistani public sector organizations however gave insights on the implementation of IT governance in public sector.
Mello (2020)	Qualitative study	ICT is essential for digital inclusion and social justice.	Emphasizes the role of ICT in economic opportunities and how essential it is in the daily operation of organisations for effective governance.	Did not cover all aspects of ICT implementation in public services.
Sofyani et al. (2020)	Mixed methods	Strong IT governance enhances accountability and transparency.	Highlights the importance of governance frameworks.	Results did not fully capture the complexity of local government dynamics.
Zhen et al. (2021)	Quantitative analysis	IT governance mechanisms improve	Emphasizes the role of top	Focuses mainly on quantitative metrics, potentially

		organizational agility.	management support.	overlooking qualitative insights.
Rusman et al. (2022)	Literature review	COBIT and ITIL frameworks contribute to effective IT governance.	Provides a comparative analysis of governance frameworks.	Did not fully address practical implementation challenges.
Amedzro (2023)	Conceptual discussion	Digital technologies governance leads to improved public service delivery.	Discusses frameworks for state-owned enterprises.	Lacks empirical evidence from case studies.

2.4. Literature search settings

From all time periods, without any restrictions, using the Sabinet Database and Google Scholar, 147 documents included State-Owned Entities information technology governance. To find relevant works from 2019 to 2025 including the present year the following configuration was used. One specific question is: (Title-key) IT governance, (Title-key) digital technology, and (Title-key) the performance of public entities. Additional parameters were also used to improve the effectiveness of the research cycle, such as the year of publication (2014–2025), the document type, conference papers, and journals with book series. Following the implementation of the settings, 106 documents served as the foundation for the present chapter and were analysed further. Not to mention that organisations and the government were among the several categories. Finding relevant journals and their respective contributions to the performance of state-owned entities was a further step in finalizing the features of the chosen papers in this study.

Table 2.2. A detailed comparison table outlining advantages and disadvantages of using Sabinet and Google Scholar along with reasons for choosing each.

Feature	Sabinet Advantages	Disadvantages	Google Scholar Advantages	Disadvantages
Coverage & Specialisation	Strong in African research (SA theses, journals, and government documents).	Restricted worldwide content.	Extensive worldwide reach (all disciplines).	Lacks research particular to Africa.
Peer reviewed content	Selected, superior African journals.	Some content is protected by paywalls.	Large peer-reviewed paper index.	includes low-quality preprints and predatory journals.
Legal & Policy Research	Best for SA law, government gazettes, and policy documents.	Legal & Policy Research For international law, not ideal.	Case Law provides some case law.	African legal resources are scarce.
Search functionality	Advanced filters (topic, date, and African focus).	Increasing learning curve.	Easy, Google-style search.	Less accurate (several unrelated results).
Open access availability	None	Primarily subscription-based (with restricted free access).	Additional free full-text links	None

User friendliness	None	Training is necessary for efficient searches.	A familiar and intuitive interface.	None
Multi-Disciplinary Use	Ideal for African humanities and social sciences.	Not strong in STEM.	Covers all areas (arts, STEM, etc.)	None
Thesis & Dissertations	Strong in ETDs and SA thesis	Limited worldwide coverage	Global theses (ProQuest, institutional repos).	Less well-known are African thesis

In summary, a balanced strategy that incorporates both local relevance and a global perspective is ensured by using both. Sabinet is greatest for research with an African focus, policy, and law (but limited globally). Google Scholar is the best resource for global publications, citations, and evaluations of the research, but it lacks African depth.

2.5. Documents analysis

237 papers from the years 2014–2025 that contained all of the keywords IT governance, digital technology, and public entities performance were found using Google Scholar and several Sabinet databases. One criterion that the document must use IT governance and digital technologies to enhance performance capabilities in state-owned entities was used to choose 106 documents to make the study more accurate and feasible. For improved performance in state-owned enterprises, the publications provide a thorough understanding and explanation of how IT should be integrated with digital technologies.

2.5.1. IT governance and digital technologies

Muslih et al (2020) postulate that Information technology governance is essential to improving organizational performance in State-Owned Entities (SOEs) by ensuring that IT plans and resources

are successfully in line with the goals of the company. Furthermore, budgetary restrictions, regulatory compliance and the requirement for openness are some of the particular difficulties faced by SOEs which frequently work in fields vital to the delivery of public services and national growth. Therefore, by offering an organized framework for risk management, resource allocation, and decision-making, IT governance tackles these issues as IT Governance guarantees that technology expenditures directly improve operational efficiency, service delivery, and overall performance by coordinating IT activities with the organization's overarching objectives (Nyingi, 2019). This study focused on challenges such as IT infrastructure and the lack of policy implementation based on analyses through literature for organizational competence. A study conducted by Sharma and Purandare (2023) states that in many nations such as the UK, Thailand, Kenya, and the USA, contain an idea of IT governance which gained popularity in the public sector. As the Implementation of information technology (IT) governance principles is becoming standard among businesses and organizations, especially in the public sector.

Daiser et al., (2017) further add that strategic alignment is one of the main ways that IT governance improves organizational performance in SOEs as it can prioritize initiatives that yield the greatest return on investment thanks to IT governance which makes sure that IT strategies are firmly linked to the entity's mission and goals. For instance, IT governance assists SOEs in putting in place technologies that enhance citizen service delivery while minimizing expenses in industries like utilities, healthcare, and transportation. Thus, IT governance encourages transparency and accountability, both of which are essential for SOEs that answer to the general public. Hermanto et al. (2021) alludes that IT governance ensures that decisions pertaining to IT are made in an open and accountable way by defining clear roles, responsibilities, and performance indicators. This builds confidence among stakeholders and the general public.

Samushonga (2023) explains that the importance of this strategy in improving performance, risk management, and coordinating IT initiatives with business goals has led to organisational growth in various countries. As a result, numerous businesses and organizations are starting to embrace and apply the concepts and operations of IT governance during their daily operations. In support of the above assertion Harefa and Legowo (2017) further postulate that businesses and organizations are

increasingly adopting IT governance principles. To ensure compliance and provide value, IT governance focuses on ensuring that information technology systems and resources are managed effectively, limiting risks, and aligning with organizational goals. The rising adoption of these principles by public sector organizations aims to improve decision-making, accountability, and openness while ensuring that IT investments support public services and the larger objectives of social development. This expanding trend reflects the wider understanding of how crucial IT governance is to be upholding a sustainable and well-rounded approach to technology management (He et al, 2023). The next section will address the overview of IT governance frameworks, principles and related technologies in state owned entities.

2.5.2. Digital Technologies

Digital technologies, which comprise an extensive ecosystem of tools, systems, and platforms that process, store, and transfer information, constitute the fundamental infrastructure of the modern world. These technologies fundamentally transform analog experiences and processes into digital data, ranging from cloud computing and big data analytics to artificial intelligence (AI) and the Internet of Things (IoT). The crucial first step is digitization, which makes it possible to modify, analyze, and distribute data at previously unheard-of speeds and scales. This foundational layer connects people, machines, and businesses into a single, integrated network that functions with previously unthinkable fluidity and connection, serving as the central nervous system for contemporary corporations and societies (Evangelista et al., 2014).

Additionally, Paunov, C. and Planes-Satorra (2019) suggests that these technologies' main strength is their ability to produce significant operational intelligence and automation. Organizations may gather real-time data on every facet of their performance, from supply chain logistics to online customer behavior. This maximizes efficiency, cuts waste and anticipates issues by shifting decision-making from intuition to an evidence-based paradigm.

Ultimately, digital technologies are catalysts for significant change rather than just tools for advancement, radically altering social interactions and corporate processes. They make it possible to develop completely new goods and services, such AI-powered personal assistants, smart linked gadgets, and on-demand streaming services. By enabling the gig economy, democratizing market access, and enabling hyper-personalization at scale, they upend traditional corporate sectors. They fundamentally alter how we interact with one another, obtain information, and engage in public life. Therefore, digital technologies are a paradigm change that goes beyond merely increasing efficiency to actively redefine the limits of what is feasible for individuals, governments, and organizations alike (Ardolino et al., 2018).

2.5.3. Overview of IT governance frameworks and principles

Oladeinde, Hassan, Farayola, Akindote and Adegbite (2023) assert that as a subset of corporate governance, IT governance encompasses the organisational processes, policies and frameworks that ensure the efficient and effective utilisation of technology in enabling an organisation to achieve its goals. Five major information technology decisions constitute governance, principles, infrastructure strategies, business applications, and architecture. These decisions are significant for growth as organisations are increasingly relying on technology to steer business operations, which further makes it crucial for organisations to have robust mechanisms in place to direct and oversee proper alignment of business strategies with their technology functions. Several frameworks underpin IT governance, which elucidates that the frameworks are a set of organisational procedures and policies that act as an enabler to monitor, evaluate and measure their performance with predefined criteria, benchmarks and factors that impact the organisation (Linkov et al,.2018).

2.5.4. IT Governance and Management Theories

The importance of 5-year governance goals as per the NDP in South Africa is to improve efficiency through strengthened alignment of information, improved capability, governance, finance, and good

management (Stohl et al, 2019). Information Technology governance permits the alignment of information technology and Business strategy as it provides a formal structure for the government to produce measurable results towards achieving its objectives aligned with information technology. It is imperative to monitor the organisational performance to guide the improvement programs of the government. Organisational management is measured concerning strategic goals and key performance indicators in order to improve organisational performance (Ma, 2020). The imperative need for proper alignment of information technology innovation and performance not only impacts the business positively but also comes with an increased awareness of understanding the discipline of enterprise architecture (EA), compliance management and governance. The public sector may not be able to fulfil its policy objectives and related responsibilities if business or information technology governance principles are not taken into consideration at any given time (Mikalef et al., 2021). In order to increase control and oversight over the information technology function, information technology governance—a subset of organizational governance—should receive special attention from the government.

Ncamphalala and Vyas-Doorgapersad (2019) further emphasise that the South African government is required to take advantage of the growing role of technologies in the daily operations and functioning of urban systems which can provide smart governance and, in addition, have a knowledge-based society. Smart governance strengthens a collaboration between the government and its stakeholders through various platforms such as social media, open data and the internet.

2.5.5. KING Report

The King Committee on Corporate Governance in South Africa published the King Reports. They list some values and methods for effective government. The actual code of practice that converts these ideas into practical suggestions is the King Code that goes with it. They are widely recognized for its progressive, principles-based (as opposed to strict, rules-based) approach, which emphasizes ethical leadership, sustainability, and stakeholder inclusivity. They are regarded as the cornerstone of corporate governance in South Africa, notably in public and state-owned entities.

King I, II, III, and IV: The Evolution

Below, Van der Merwe (2020) and Rossouw (2020) describe the evolution of the codes and reports that have changed to suit shifting local and international business environments.

King I (1994)

KING I was issued shortly after Apartheid ended. In order to draw in foreign investment and conform to international norms, its main objective was to advance corporate governance in a recently democratic South Africa. Main Point of Interest: It was among the first governance laws in the world to specifically establish a stakeholder-inclusive strategy and move beyond the limited shareholder-centric model, which primarily considers profit for owners. This implies that businesses have obligations to their communities, suppliers, workers, shareholders, and the environment.

King II (2002)

Following the Enron scandal and other business scandals that brought attention to the necessity of more robust internal controls and risk management. Principal Aim: It gave integrated sustainability, internal audit, and risk management a lot more weight. It demonstrated that sustainability that is, social and environmental performance was not distinct from governance but rather essential to long-term corporate success. Requirements for reporting were further reinforced.

King III (2009)

The global financial crisis of 2008 revealed serious challenges with corporate governance all around the world. Main Point of Interest: The "apply or explain" rule was formally instituted by King III. Organisations do not have to adhere to all regulations, but if they do, they must inform their stakeholders of the reasons why the deviation is appropriate in their particular situation. The principles-based approach is strengthened by this. IT Governance: It was a trailblazer in the official

inclusion of IT governance as a core board duty. Board Responsibility: It was underlined that the board, not management, bears direct responsibility for governance.

King IV (2016): The Current Standard

A need for improved accessibility, simplification, and an emphasis on results rather than merely procedures. It promotes more insightful reporting. Businesses now have to put the concepts into practice, then describe how they did it and the results. Six(6) governance outcomes ethical culture, high performance, effective control, legitimacy, and value creation for stakeholders are the cornerstones of King IV's outcomes-based governance model. King IV is intended to be used by many industries, although earlier iterations primarily targeted listed businesses. Structure Simplified: 17 Principles with suggested procedures that facilitate implementation and reporting.

Therefore, it is for this reason this study noted that the KING IV report made recommendations regarding the compliance of the State-Owned entities (SOEs), which should have appropriate information technology infrastructures to strengthen their performance. Through this improvement of the information technology governance, the government and more SOEs are going to benefit by acknowledging and setting up adequate guidelines with best practices which will provide methodologies. Therefore, King IV Steering Point (2016) noticed that IT governance will assist SOEs identify the extension of the current distribution of information that supports the organisational processes and demands to apply it for future distribution of information.

Figure 1 illustrates the many elements of information technology governance, including the relevant frameworks and standards for each component. These components assist in ensuring that |organisation's information technology functions are aligned with strategic objectives and operate efficiently. Mulyana et al., (2021), assert that COBIT and ISO/IEC 38500:2008 as the most detailed approaches to implementing information technology governance which provide high-level standards that assist with the proper implementation of the six ISO principles.

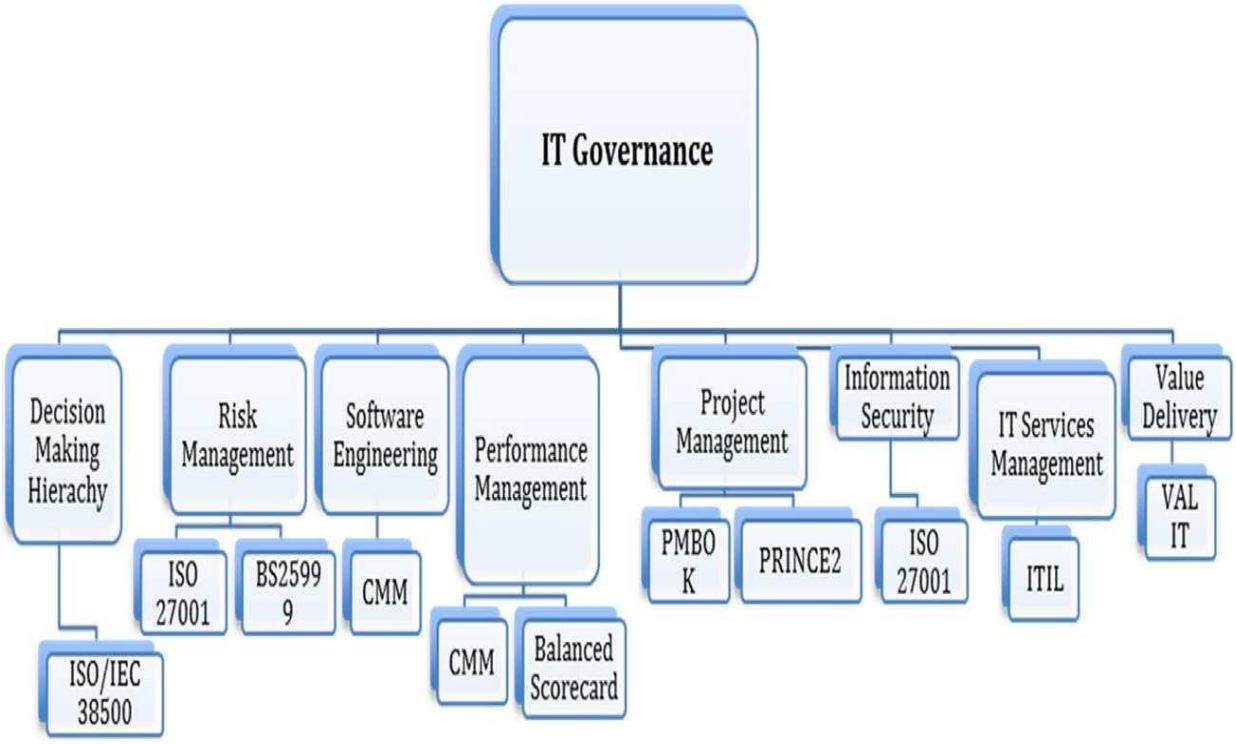


Fig.2.2. COBIT Information Technology Governance components and frameworks **Source**: (Alreemy et al.2016)

2.5.6. Auditor General of South Africa

The Auditor General of South Africa (AGSA) recommends that Information and Communication Technology guidelines and frameworks should have a full structure that allows implementation and governance, which has been noted by Nxozi and Flowerday (2021). This study seemingly stated that the roles and responsibilities of governance can be documented and approved through the information and communication technology steering committee. The results, therefore, cannot be unnoticed due to the performance capabilities. This is to ensure that information and communication technology enablement such as hardware and software are fully utilised efficiently and effectively for operations in organisations. Qassimi and Rusu (2015) further add that as an integral component to the organisation, information technology governance Key Performance Indicators (KPI's) that are clearly

defined need to be formalised and incorporated into performance contracts and the key performance indicator manual. Competent board-level committees that will provide oversight of the organisational operations for sourcing decisions and information technology investments are put in place for such factors. The board ensures that information technology decisions are effective and there is collaboration and alignment between the organisational strategic goals and information technology, which further contributes to the success of the organisation.

Mohammed, Al-Abedi, Flayyih and Mohaisen (2021) further argue that these frameworks are put in place to highlight the relationship between stakeholders and information technology managers. This puts an emphasis on the importance of monitoring and evaluation to ensure that managers act in the best interest of the organisation to achieve a balanced, fair approach and the interests of all stakeholders are considered, emphasizing the importance of good management and proper resource allocation in information technology governance.

Table 2.3. A Comparison of Strategic and Governance Frameworks (Source: Mohammed *et al*, 2021).

Corporate Governance	**Strategic Information Systems Planning**	**IT Governance**
Strategic Direction	Aligning investment in IS with business goals	Strategic Alignment
IT policies	Exploiting IT for competitive advantage	Delivery of business value through IT; exploiting opportunities and maximizing benefits
Performance Management	Directing efficient and effective management of IS Resources	Performance Management; IT resources be used Responsibly
Risk Management	Risk management plan	Risk Management; IT related risks to be managed appropriately
Policies and Procedures	Developing technology policies and architectures	Strategic Alignment

Corporate Governance of information Technology is a business issue that transcends that requires attention at the highest levels of the organisation. Table 1 of this study depicts a clear structure of information technology governance from within operational management ranks to senior management and the board, which oversees the operations of the organisation. Adopting existing frameworks and best practices such as COBIT, ITIL and ISO/IEC 3500 enables organisations to adapt to technological changes, the regulatory landscape and the business environment. Risk management is one of the important factors that could be helpful in the context of governance. A risk strategy is developed and documented at the start of the management process. A variety of organizational, business, and information technology factors should be explicitly taken into account while developing the risk strategy.

This approach further enables its information technology governance to remain relevant and responsive to the evolving technologies and organisational by setting performance metrics and establishing clear roles and responsibilities and which ensures compliance with regulatory requirements for effective information technology governance. De Haes, Van Grembergen, Joshi and Huygh (2020) add that the best information technology governance principles such as business goals alignment, value delivery, risk management, resource management, performance management, accountability and responsibility, stakeholder engagement and compliance and legal requirements provide a detailed framework to governing and managing information technology in an organisation. An increased awareness of governance in the information technology enables the assessment on areas that need improvement addressing areas where there may be practices lacking or insufficient.

2.5.7. Key components of effective IT Management

According to Joshi et al (2018) and Sirisomboonsuk et al (2018), effective information technology management is critical to ensure the information technology resources are optimally utilised to drive innovation and support business goals. Furthermore, Strategic planning, IT governance, IT service management, IT infrastructure and operations management, cyber security, and risk management are important elements that work together to create an effective strategy. These elements guarantee that

organizations adjust to the rapidly changing business environment and technological landscape, allowing them to take advantage of new opportunities and emerging technologies. In support of the above literature Paunov & Guellec (2018), further identified eight principles that are crucial for innovation policy design:

- Data access policy for innovation to improve use and transparency.
- Speedy and agile policy to appropriately support emerging technologies.
- Revisit innovation and traditional support instruments to address limitations.
- Support core technology development that prepares for future emerging technologies.
- Foster collaboration between academia and industry to promote open innovation.
- Enable entrepreneurship and competition.
- Education and training in preparing and acquiring the right skills for digital transformation.
- Set national policies on IT governance.

The purpose of information technology governance policy is to direct IT endeavours as guided by the principles of the KING IV report. It ensures that risks are mitigated, and investments are made wisely, and complies with the legislation and all relevant laws. Information technology policies must be reviewed regularly for continuous improvement and updates to exploit information technology opportunities and reflect changes in the organisations technology, strategy and regulations (Alansari and Al-Sartawi, 2021).

2.5.8. IT Governance in State Owned Entities (SOEs)

To establish a clear IT governance in SOEs, roles must be clearly defined through a descriptor manual, which has a clear delineation of who is responsible for IT decisions, implementation and monitoring. This will aid in ensuring that comprehensive IT policies that align with regulatory requirements and organisational goals are developed. The alignment of Information technology goals with organisational goals helps in prioritising IT projects that contribute directly to the organisational objectives by monitoring Key Performance Indicators (KPIs) that measure information technology's

contribution to the organisational goals (Leketi & Raborife, 2019). In addition to the above elucidation De Haes et al, (2020) adds that a comprehensive IT governance framework and implementation plan, that ensures the smooth adoption of IT governance assist in supporting the regular monitoring and assessment of progress and make the required adjustments based on perf ormance feedback to leverage technology and innovation by keeping up with the most recent technological developments that can be implemented to further improve the performance of the organization.

Joshi et al (2018) argue that maintaining strong IT internal controls is imperative as it reduces or mitigates risk, as Information Systems and technology advances expose organisations to a new range of risks, which can be a result of poorly planned and managed IT deployments. There is an overlap flanked by IT control frameworks and audit requirements, which further provides information and processes required by auditors. There continues to be a demand for managers to do more with fewer resources, which becomes a challenge for them to deliver, structure ed and effective IT planning processes are becoming more essential.

2.5.9. Performance Evaluation

Davids et al. (2015) assert that it is important to recognize the role of M&E and introduce it as a discipline in universities. Because of the lack of M&E qualifications in South African government entities such as the Public Service Commission (PSC), the South African Monitoring and Evaluation Association (SAMEA) has been equipped with the tools for monitoring government performance and improving service delivery. Economic development mainly focuses on eradicating poverty by improving standards of living, enhancing teaching, a strong economy and equal opportunities (Stem et al., 2018). By assessing IT governance's efficacy, organizations may analyse and improve IT performance and procedures continuously, while also ensuring that appropriate data protection mechanisms are in place to secure sensitive data.

2.5.10. Performance Evaluation Systems

Monitoring and Evaluation within organizations is always presented to describe distinct processes. Monitoring on itself is a routine and an ongoing function that gathers data about a program, project or policy for managing and policy making resolutions, whereas evaluation refers to the objective valuation of the conclusions, impact and efficiency of a completed project to determine the impacts to the intervention (Ba, 2021).

Generally, M&E practices form the basis for better decision making (Ba, 2021). The need for increased accountability, and the introduction of well-designed M&E systems.

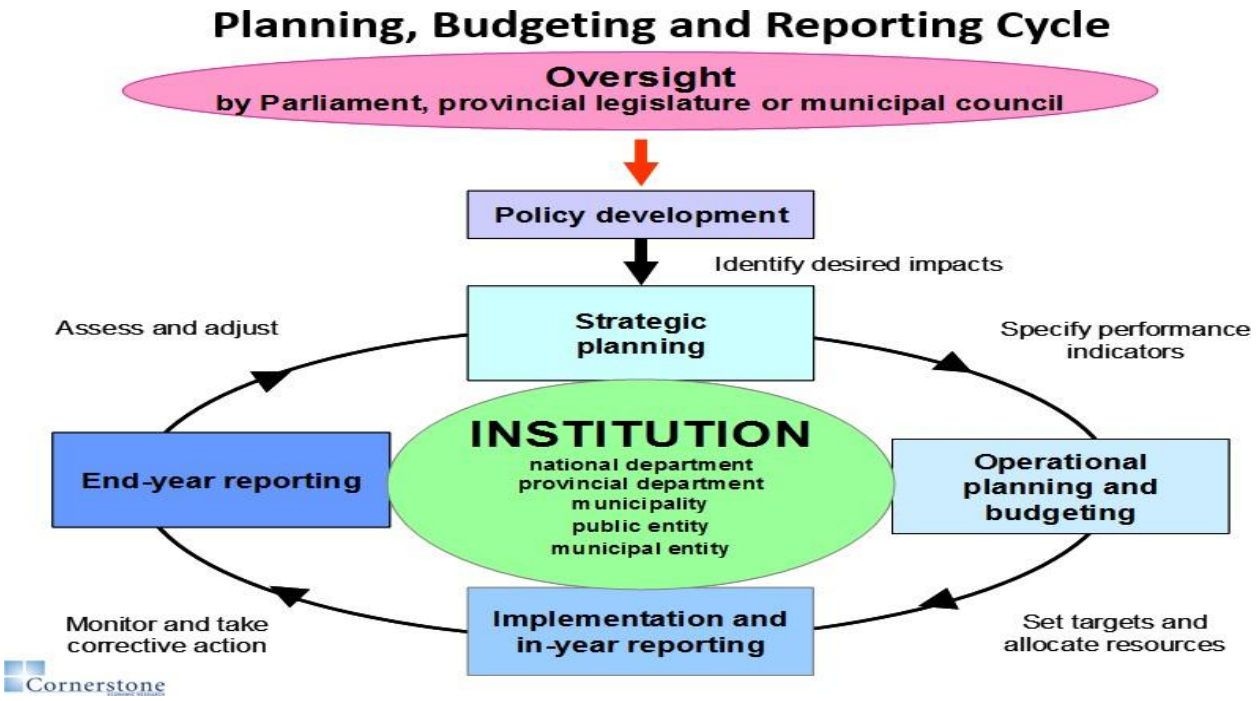


Figure 2.3: Planning, Budgeting and Reporting Cycle (Cornerstone Economic Research: 2001).

Therefore, organisations need to understand the importance of designing reporting systems that will not only focus on reporting purposes but also show accountability. According to Palmer et al. (2015), a good flow of information for organizations requires a well-designed, less time-consuming and easy-to-implement good governance system to be in place to ensure the right information is collected at the right time. In addition, organizations need to ensure that proper strategic planning is done, and the staff is well-trained and competent in the methods of performance reporting, while stakeholders are involved in strategic planning.

2.5.11. Good Governance Strategic Plan for Information Technology in SOE's

A thorough explanation of the IT strategy plan that addresses many different subjects, including technological architecture, may be found in the Information technological (IT) Master Plan. This study maintains that information technology should being used as a tool to assist a company or organization in achieving its objectives. Consequently, the organization must have a clear vision and goal before the IT Master Plan can be developed (Daiser et al, 2017). The IT master plan serves as the foundation for the organization's IT investment and deployment strategies. Therefore, companies can do more than just purchase and deploy IT to reduce the risks involved with its implementation. Thus, the development of an IT master plan can facilitate each firm organization's alignment to achieve a goal (Lubis et al, 2023).

Jiapin (2023) highlights the importance of information technology governance, which is the term used to describe the systems and practices that ensure the effective and efficient use of IT to assist a business in achieving its goals. SOEs require a strong information and communication governance structure for several reasons. Technology and information make sure that investments in technology complement the company's goals and mission, which facilitates the achievement of strategic outcomes. Moreover, Muslih et al, (2020) and Amedzro (2023) add that as cyber threats and data breaches rise, risk management becomes increasingly important. Good governance helps identify, assess, and mitigate IT-related risks, and a well-defined governance framework promotes stakeholder accountability, ensuring responsible IT resource management.

In today's rapidly evolving technology landscape, state-owned enterprises (SOEs) are increasingly realizing the critical role that digital technologies play in enhancing their performance capabilities. Among the challenges faced by SOEs as public sector organizations tasked with delivering crucial services are budgetary constraints, public responsibility, and the need for efficiency and transparency. By integrating digital technologies such as cloud computing, big data analytics, artificial intelligence (AI), and the Internet of Things (IoT), these enterprises have a revolutionary opportunity to overcome these challenges and improve their operational efficacy (Amedzro, 2023).

2.5.12. Organizational Structure and Information Technology Planning

Lubis, Ananza and Suryoputro (2020) posit that several state-owned enterprise IT governance frameworks are used as the process in the Ministerial Regulations concerning information technology issues. One of these frameworks is the strategic policy process, which establishes the function of IT in the organization. The framework maintains that planning and IT organizational framework is meant to ensure that all current procedures can be run in compliance with the guidelines and be matched with the company's future requirements.

Since SOE serve as the cornerstone for efficient operations, strategic alignment, and effective governance, organizational structure and information technology (IT) planning are essential to the success of State-Owned Entities (SOEs). It is the same reason that an SOE's organizational structure establishes the hierarchy, functions, and duties inside the company, guaranteeing transparent decision-making procedures and upholding responsibility as addressed by Apriyantopo, Aprianingsih, and Kitri (2023). The definition of organizational structure in the context of IT guarantees that major operations which are included into the entity's larger operational framework. In order for SOEs to use technology for better service delivery, cost optimization, and innovation, this integration is crucial for coordinating IT projects with the organization's strategic goals. In addition to the above assertion Muslih et al, (2020) further contends that IT planning can become disjointed in the absence of a clear organizational structure which can result in inefficient goals that are not aligned and lost growth possibilities.

The above assertion is supported by Jiapin (2023) who suggest that to ensure that technology supports strategic goals effective IT planning must be in line with the organizational structure as IT planning in hierarchical organizations usually entails formal procedures and long-term plans that correspond with the chain of command. Enterprise-wide solutions that encourage uniformity and control are frequently advantageous to these enterprises. Agile or flat businesses, on the other hand place a higher value on cooperation and flexibility which necessitates flexible IT planning that can handle sudden changes. In this context, IT systems are frequently made to give teams access to scalable platforms, decentralized tools, and real-time data to promote creativity and responsiveness. Risk management, project prioritization, and resource allocation are all impacted by the connection between organizational structure and IT planning. IT resources are used effectively and in line with the organization's aims when there is a well-aligned structure in place (Amali, Katili and Suhada, 2023).

2.5.13. Management of Information Technology Investment

An essential component of IT governance is through assessment of investment in management and the quantification of business benefits. Pratama and Pratika (2020) claim that in managing information technology investments at an organisation, several techniques should be developed by some professionals to calculate. Thus, it is anticipated that better and more accurate findings will be obtained when benefit quantification and ideal value are combined. IT expenditures come with significant operational and financial impacts. Expenses for buying, maintaining, and using are included. Mbo (2017) further argues that although benefits estimation is not always precise, IT investments provide both tangible and intangible value, in contrast to assets that lose value over time as management oversees all IT expenditures, including hardware, systems, and how well they match business needs. Furthermore, the development of standards and metrics to evaluate the performance and feasibility of IT projects is a crucial component of IT investment management. Organizations can specify these metrics with the aid of governance frameworks like COBIT or ITIL, which provide standards for assessing costs, benefits, risks, and alignment with business objectives. Organizations can classify and rank IT investments using techniques like portfolio management, differentiating between key initiatives with high value and those with lower effect

or greater risk. This methodical strategy maintains control through ongoing monitoring and performance assessments, guarantees that IT investments are justified, and contributes to long-term organizational success (Moudoubah, Yamami, Mansouri and Qbadou, 2021).

In support of the above claim Ilori, Nwosu and Naiho (2024) claim that Cooperation between IT stakeholders and business executives is a crucial component of IT investment management within governance. As all organizational levels are encouraged to actively participate in effective governance structures, which guarantee that technology expenditures are both strategically and operationally viable. Organizations may monitor the effectiveness of IT initiatives, spot problems, and reallocate resources as needed with the help of regular reviews and progress evaluations. IT investments are kept in line with changing company requirements and market conditions thanks to this cooperative and flexible approach.

2.5.14. Information Technology Service Management (ITSM)

Rusman, Nadlifatin and Subriadi (2022) highlights that organisations are becoming more and more dependent on IT they need to manage their IT assets. Information technology management needs to adhere to standards. The goal of the Information Technology Infrastructure Library (ITIL) framework is to improve the efficiency of the IT services that customers receive. By putting ITSM into practice, it is hoped that IT service management will advance and be able to resolve some of the problems that the business is now facing. This necessitates the use of Information Technology Service Management (ITSM), the best practices for efficient IT service management. The way the service is provided and supported can be used to gauge this. Under the moniker Corporate Shared Service (CSS), IT service management transforms ICT management into a shared service organizational concept and Information Security Management System (ISMS) which offers guidelines for reducing IT risks. Serrano et al (2021) adds that to get acceptable levels of information security. IT Information security focuses on creating risk values and governance documents in addition to creating, putting into practice, and maintaining systems, policies, and procedures. Implementing information security management is crucial, especially for educational institutions, as it can lower the risks associated with educational organizations' use of technology.

To reduce the risk of growing data and information threats, information security management is required. Finding both technical and non-technical problems is the goal of information security management.

2.5.15. The importance of Information Technology governance in South African state-owned entities.

Stone et al. (2015) defines information and communication technology as the use of computers and telecommunications devices to gather, store, retrieve, and distribute data for an organization's operations. In order to promote digital inclusion and close the digital divide, ICT is essential. Ensuring fair access to technology is essential for advancing social justice and economic possibilities as economies depend more and more on digital platforms. Governments and organizations are putting policies and programs in place to improve digital literacy and infrastructure because they understand how important ICT is to be reaching these objectives (Mello, 2020). According to Jere et al. (2020) the importance of the field research that looks at how businesses accept and incorporate new technologies into their daily operations is dependent on technology adoption. Therefore, information technology governance includes the procedures, incentives, and difficulties related to technology adoption, which can have a big influence on competitive advantage and organizational success. Since state-owned companies (SOEs) frequently face specific demands to modernize while balancing public accountability and service performance, it is especially important to understand how they adopt technology. Sofyani (2020) state that effective IT governance frameworks help firms maximize resources by facilitating accountability and decision-making. A number of models, including ISO standards and the COBIT framework offer recommendations for creating strong governance frameworks. Strong IT governance improves corporate performance, risk management, and compliance, according to the literature.

It is for this reason that good IT governance guarantees that proper investments and plans are directly in line with SOEs' overarching objectives. In South Africa, where SOEs are key to providing basic services and promoting economic growth, this alignment is vital. SOEs can

improve their operational effectiveness and service delivery by coordinating IT projects with strategic goals (Sutherland, 2020). Zhen et al. (2021) elucidates those significant risks to cybersecurity, data privacy, and regulatory compliance are faced by SOEs. In order to ensure that SOEs can protect sensitive data and uphold public confidence, strong IT governance frameworks aid in the identification, evaluation, and mitigation of these risks. This is especially crucial in South Africa, where problems with corruption and poor management have long reduced the efficiency of state-owned enterprises.

According to Wilkin et al. (2020) by concentrating on how businesses handle digital assets and technologies, digital governance applies the concepts of IT governance to the digital sphere. The most important aspect is that World Economic Forum (WEF) defined the use of digital governance as the set of rules, guidelines, and procedures that guarantee the efficient and responsible use of digital technologies. As businesses realize how crucial digital transformation is to be accomplishing strategic goals, interest in this field of study is growing. Scholars such as Mbo (2017) as well as Daiser et al, (2017) agree that in addition to improving operational effectiveness, good digital governance encourages creativity and adaptability to changing market conditions.

2.5.12. Digital technologies to enhance performance capabilities in State owned entities

State-owned enterprises (SOEs) are becoming more aware of the vital role that digital technologies play in improving their performance capabilities in the quickly changing technological world of today. Budgetary restrictions, public accountability, and the requirement for efficiency and openness are some of the difficulties faced by SOEs as public sector entities entrusted with providing important services. These organizations have a revolutionary chance to overcome these obstacles and enhance their operational efficacy through the integration of digital technologies, including cloud computing, big data analytics, artificial intelligence (AI), and the Internet of Things (Amedzro, 2023). In addition to the above, (Malope et al, 2021) state that SOEs can improve service delivery, optimize resource allocation, and streamline procedures with the help of digital technologies, which eventually raises citizen satisfaction. Cloud computing, for example,

provides scalable solutions that lower infrastructure costs, while big data analytics gives decision-makers access to insightful information gleaned from enormous databases. Similar to how IoT devices can enable real-time monitoring and control of public services, AI and machine learning can automate repetitive operations, freeing up human resources for more strategic endeavours. As stated in figure 1 below that information technology governance should focus on different areas such as performance measurement, risk management, stakeholders value drivers, IT value drivers as well as the strategic alignment within the information technology.

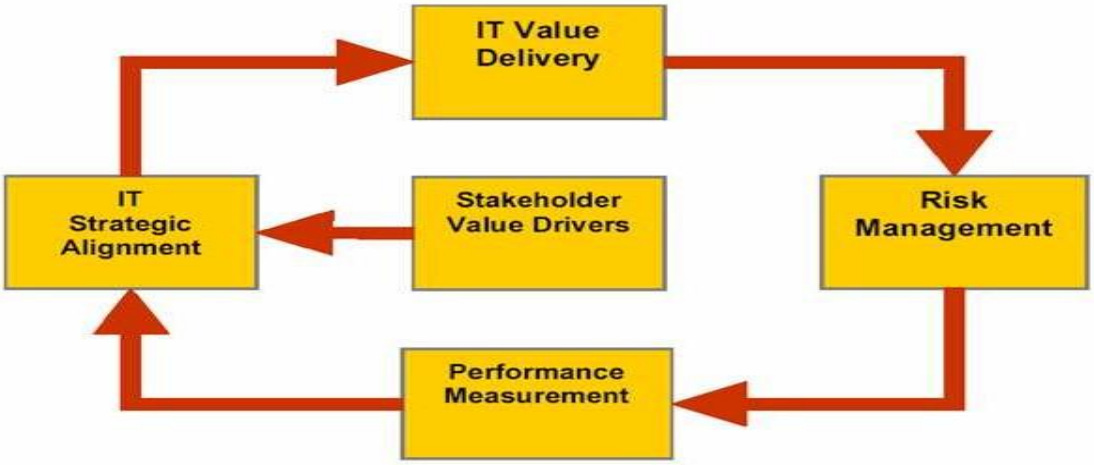


Figure 2.4. IT Governance Focus Area**. Source** (Wibowo and Yuwono, 2008)

Additionally, implementing these technology supports larger government goals including increasing accountability, encouraging transparency, and spurring innovation in the provision of public services. In addition to enhancing internal operations, SOEs can increase citizen participation and meet citizens' expectations in an increasingly digital world by utilizing digital tools (Rachmonov and Choriev, 2022). Moreover, Martinez et al. (2020) added that State-owned enterprise have a great chance to improve their performance capabilities through the incorporation of digital technologies. Understanding the motivations behind, difficulties with, and possible uses of these technologies will be crucial as SOEs negotiate the complexity of digital transformation. In addition to increasing their operational effectiveness, SOEs can better meet the demands of the communities they serve by embracing innovation and utilizing digital solutions, which will promote a more accountable and responsive public sector.

2.5.16. Corporate Governance

The concept of corporate governance has changed significantly throughout time. Early corporate governance frameworks frequently lacked formality and paid little attention to stakeholder interests or accountability. However, the necessity of strong governance structures has been brought to light by significant corporate scandals and failures, such Enron, WorldCom, and more recently, the 2008 financial crisis. The significance of moral leadership, risk control, and open financial reporting was highlighted by these incidents (Solomon, 2020). It was noted by Larcker and Tayan (2020) that there are key components of corporate governance which consist of:

- Board of Directors: At the heart of corporate governance, the board is in charge of establishing the company's strategic direction, supervising management, and making sure the business acts in the shareholders' best interests. The board's independence, diversity, and experience are frequently used to gauge its efficacy.
- Management: The functions and duties of management are outlined in corporate governance frameworks. In order for management to be held accountable to the board and shareholders, they must act openly and in accordance with the goals of the business.
- Shareholder Rights: With the ability to vote on important issues like board member elections and big business deals, shareholders are essential to corporate governance. Upholding the rights of shareholders is essential to making sure businesses continue to answer to their owners.
- Stakeholder Engagement: Employees, clients, suppliers, and the community are just a few of the stakeholders that modern corporate governance acknowledges as being important. Companies can better comprehend these groups' interests and incorporate larger societal issues into their governance procedures by interacting with them.
- Regulatory Frameworks: Corporate governance processes are governed by a number of laws, rules, and recommendations. These frameworks, which differ from one nation to the next, comprise guidelines established by international organizations, stock exchanges, and regulatory authorities. They frequently concentrate on topics including executive salaries, financial disclosures, and board duties.

2.6. Uses of COBIT, ITIL and ISO

Mangalaraj et al. (2014), COBIT (Control Objectives for Information and Related Technology), created by ISACA (Information Systems Audit and Control Association), is a framework that some businesses use to manage their IT. The British Government created the ITIL (Information Technology Infrastructure Library), a popular approach with an effective framework that has been accepted and acknowledged globally as a service management standard. The ISO 27002 is frequently used in IT operations to standardize security in enterprises, even if COBIT and ITIL are guidelines.

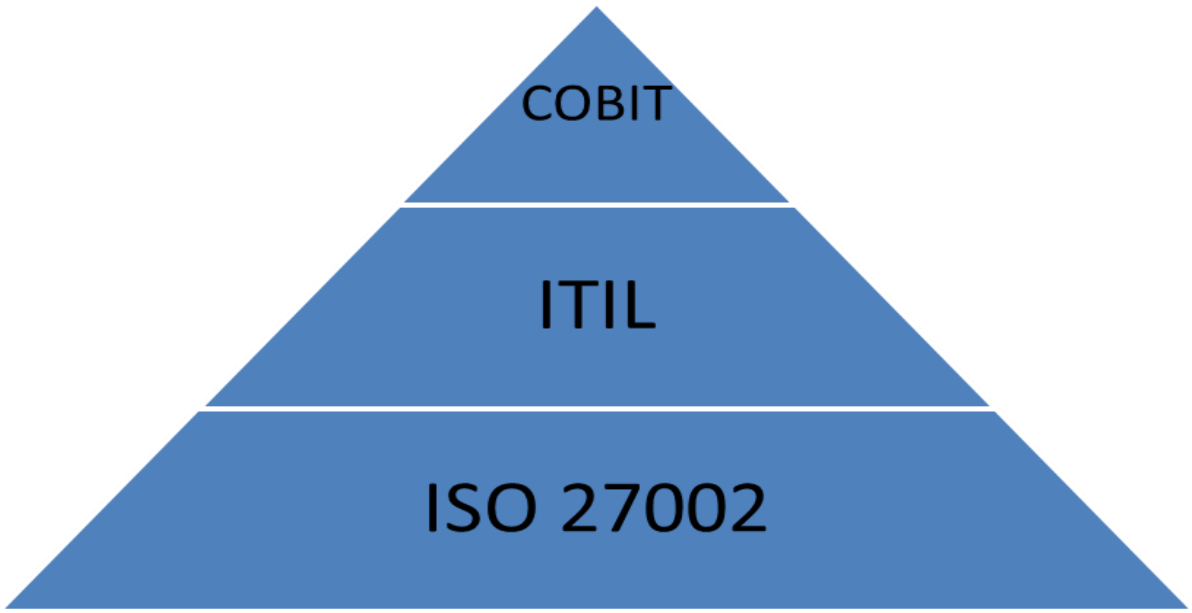


Figure 2.5. IT Governance Frameworks. **Source. (**Mangalaraj et al. 2014)

2.6.1. Control Objectives for Information and Associated Technologies

The IT Governance Institute (ITGI) and the Information Systems Audit and Control Association (ISACA) collaborated to develop the Control Objectives for Information and Associated Technologies (COBIT), as Rusman et al. (2022) stated. According to Moudoubah et al. (2021) a further support should be above the primary goal of COBIT is to promote best practices through an organized, global IT standardization process. Therefore, identifying an organization's core IT competencies and coordinating IT with the business plan, COBIT maximizes the advantages of

IT. The following areas are the main focus of COBIT: strategic alignment of the firm's business plan; IT alignment with the company's operations; resource management optimization to increase return on investment; and effective risk management to lower major risks to the organization.

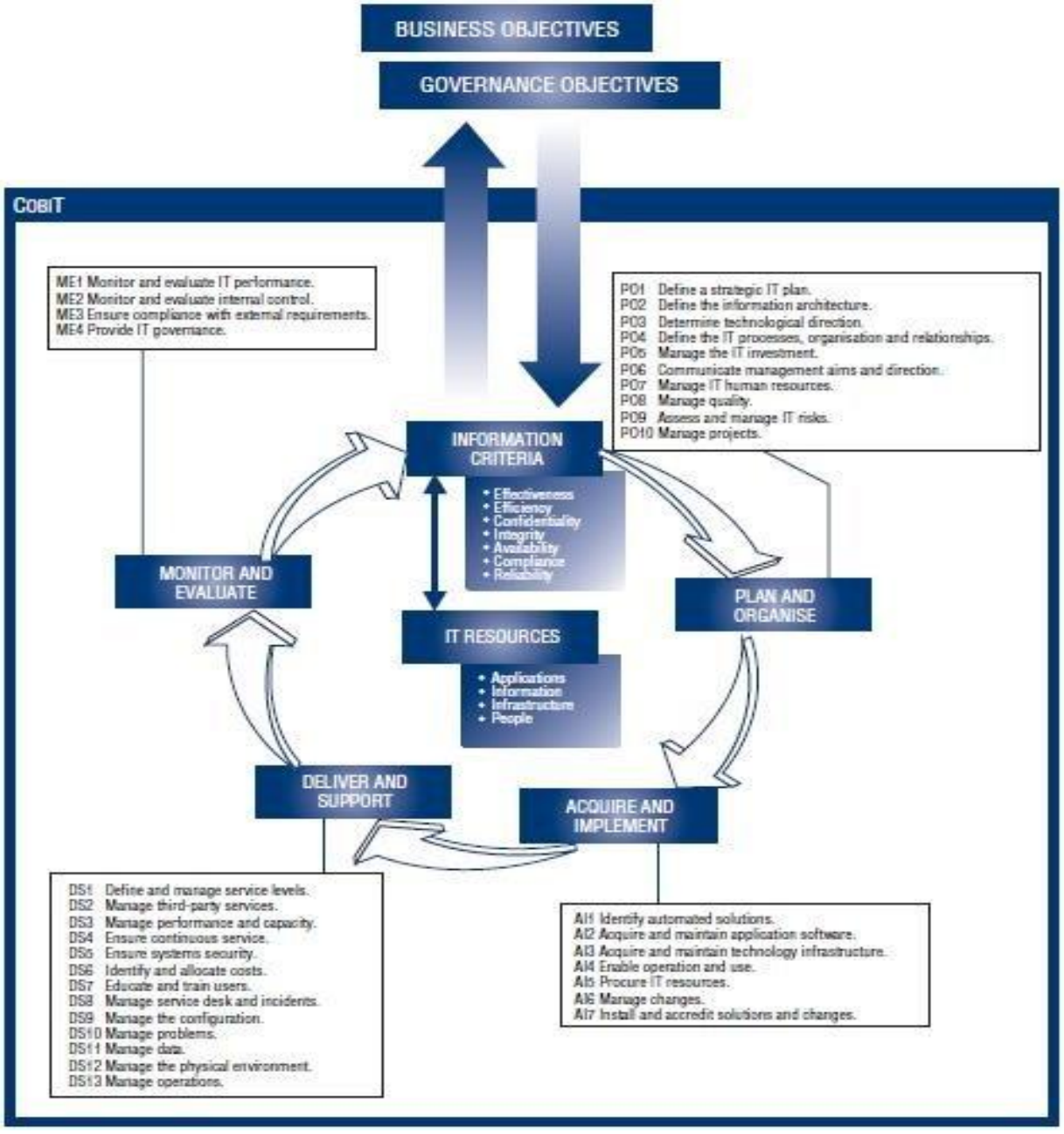


Figure 2.6. COBIT Framework **Source**: (Khther and Othman, 2013)

The COBIT framework's importance stems from its capacity to close the gap between more general business strategy and technical IT activities (Ikhsan, Widodo and Adi, 2021). COBIT assists organizations in making better decisions, performing better, and reducing the risks related to IT operations by providing a comprehensive approach to IT governance. Kesuma et al., (2022) further add that, it is especially useful in the current digital environment when companies mostly depend on technology to spur innovation and stay competitive. Organizations can create clear accountability, optimize workflows, and guarantee that IT efforts are in line with business aims thanks to COBIT's structured approach. As a result, achieving operational excellence, upholding adherence to industry rules, and cultivating stakeholder confidence all depend on this connection.

In addition, COBIT is one of the flexible tools for IT governance since it can be adjusted to different sectors and organizational sizes. It assists businesses in dealing with issues, including data privacy issues, cybersecurity dangers, and the rapid pace of technological advancement. For organizations to establish a strong IT governance framework that protects their assets and promotes long-term growth by putting COBIT into practice. It becomes important for COBIT to essentially act as a basic framework for businesses looking to maximize the use of their IT resources while preserving accountability, control and transparency in a digital world that is becoming more and more complicated (Maleh et al, 2021).

Important Components of COBIT:

Maleh et al. (2021) and Rusman et al. (2022) state that there are six fundamental ideas from the foundation of COBIT and they serve as a framework for IT governance and management, which are:

- Providing value to stakeholders.
- Comprehensive strategy for governance.
- System of dynamic government.
- Governance is not the same as management.
- Adapting to business requirements.
- Comprehensive governance framework.

Enablers: A group of enablers that facilitate the application of IT governance are identified by COBIT. These consist of:

- Processes: Organized groups of actions to accomplish goals.
- Roles and duties in organizational structures.
- Organizational values and attitudes are referred to as culture, ethics, and behaviour.
- Information: The data needed to make decisions.
- Applications, Infrastructure, and Services: IT systems and tools.
- People, Competencies, and Skills: Expertise and human resources.

In summary, companies looking to improve their IT governance and management procedures can benefit greatly from the COBIT framework. In an increasingly complex and digital environment. COBIT ensures that organizations manage risks, provide value, and connect IT with business goals by offering a thorough and organized approach (Juiz and Gómez, 2022).

2.6.2. Information Technology Infrastructure Library

The Information Technology Infrastructure Library (ITIL) is a collection of best practices on IT services. In the late 1980s, the Central Computer and Telecommunications Agency (CCTA) in Britain created ITIL. This study has realised that ITIL offers a framework for best practices that directs IT service management. For modern organizations, ITIL service strategy offers recommendations for the design, development, and implementation of service management and service strategy. Regarding the values that ought to guide the organization's service management procedures, these rules provide it more authority (Nachrowi et al. 2020).

The development activities of both internal and external suppliers, service control, and the application of control procedures throughout their life cycle are all represented by the ITIL management service. These guidelines are very helpful when creating policies to oversee and manage the ITIL service lifecycle. It is noted in this study that guidelines for the design and development of IT management services and procedures remains to be a part of the project service process (Alonso and Calderon, 2020). It is stated that Yamami et al. (2018) that activities remain

to be the process of converting strategic goals that have previously been established in a service portfolio. ITIL transition services gather the requirements of the service strategy, analyze the services project, and apply this context to service operations to lower the risk of failure and offer guidance regarding the requirements of the service strategy encoded in service design that are successfully implemented in service operations.

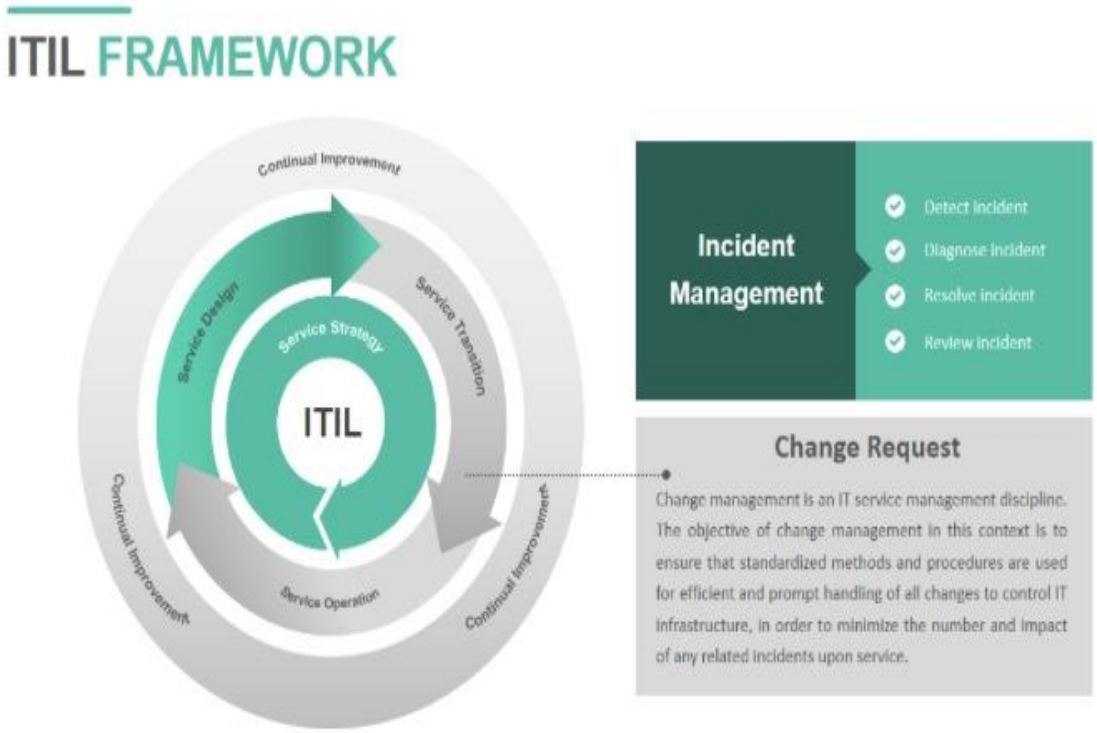


Figure 2.7. ITIL Framework **Source:** (Gërvalla, Preniqi and Kopacek, 2018)

ITIL describes the best practices for IT service management, from strategy creation to continuous service improvements. According to Moeller (2013), service strategy employs five primary processes to map out an organization's current state: business relationship management, financial management, demand management, strategy management for IT services, and service portfolio management. According to a study by Orr et al. (2016), it is also advantageous to identify the IT

services that businesses need, comprehend how these services should be delivered, define the clients, develop the offer, find strategic assets, determine the value of the service, develop a financial forecast for the services, and assess how changes in the business environment would affect the IT services. The results include a thorough explanation of the IT services provided to clients, IT planning to meet organizational goals, a financial budget, and a performance plan.

2.6.3. The connection between ITIL and the five pillars of IT governance

Due to ITIL's service value system offers the useful, operational "how-to" for accomplishing the strategic goals established by the governance framework, ITIL and the five pillars of IT governance are inextricably linked. ITIL methods directly support the five pillars: value delivery, strategic alignment, resource management, risk management, and performance measurement. Through its service value chain, ITIL guarantees value delivery, integrates risk management into every process, optimizes resources, integrates IT with business strategy, and employs measurement and reporting for ongoing development. IT governance essentially establishes the "what" and "why," while ITIL offers a tried-and-true paradigm for the "how," guaranteeing that IT operations are efficiently managed and support business objectives.

2.6.3.1. Alignment of ITIL and strategy

Al-Ashmoery et al. (2021) claim that synchronization of corporate strategy with IT is crucial as there are three components to business-IT alignment: architecture, governance, and communication. In the context of a corporate organization as discovered by Ernawati and Wang (2023) dividing the function of ITIL in IT and strategy alignment into two distinct ways in their study, they claim that ITIL makes use of IT services as a means of facilitating company maturity by meeting business strategies and goals, as well as a means of enabling and potentially launching new business initiatives.

Furthermore, this study noted that the improvement of information technology services and fostering leads to better communication between IT and business can help achieve strategic

alignment with the ITIL implementation. Moreover, ITIL is seen as a system that breaks down barriers and permits knowledge sharing among members of the organization. Notwithstanding that ITIL enhances organizational infrastructure proficiency, supports business strategy, and improves IT strategy; ITIL assist in improving the quality and availability of IT services, which results in more satisfied customers and more competitive advantages by ensuring that all organizational operations are consistent (Richter and Lantow, 2022).

2.6.3.2. Value creation and ITIL

Orr et al. (2016) assert that values in the corporate environment are connected to both design and business outcomes. Furthermore, values can be expressed in many ways, such as delivering business metrics supported by IT quality measurements, evaluating IT quality in terms of business and user outcomes, such as customer satisfaction and outcome achievement, and reaching service levels from the perspective of business outcomes. ITIL may contribute to value creation by increasing market areas, competition, and effectiveness by utilizing the Service Strategy phase and coordinating IT with business strategy.

In the context of IT services, value creation is the process of providing customers and stakeholders with significant benefits by making sure that IT solutions efficiently satisfy business needs. Additionally, value in the context of IT Service Management (ITSM) encompasses both technology and how services support business objectives, as the value generation is greatly aided by the IT Infrastructure Library (ITIL) framework, which offers organized best practices for IT service management. With its Service Value System (SVS), the most recent edition of ITIL 4 places a strong emphasis on value co-creation and makes sure that all IT activities support business goals (Tuomisto, 2022). Richter and Lantow (2022) in their study suggest that two essential elements make up the framework's definition of value: utility (if a service achieves its goal) and warranty (whether it is dependable, secure, and accessible) as ITIL also presents the Service Value Chain (SVC), which describes six essential actions that collaborate to develop, provide, and

improve services: Plan, Improve, Engage, Design & Transition, Obtain/Build, and provide & Support.

2.6.3.3. ITIL and Performance Evaluation

Moeller (2013) highlights how Information Technology and Infrastructure Library affect performance appraisal and one of the elements that make up the ITIL's Service Design phase is service capacity management. This oversees making sure that IT services are performed within the limitations specified in service level agreements, which outline the expectations and performance between IT and its clients as a framework that aids in optimizing IT performance both during the proposal stage and following implementation.

The following goals are included in the study by Baradari et al (2021) on the availability management process: Engage sufficient resources, including updates of the organization's present and future demands, ensure ongoing service oversight and direction to all sections of the organization's IT responsibilities, maintain presence by managing services and resources associated with the availability performance to reach. And at least meet and eventually surpass benchmarks, facilitate prompt diagnosis and resolution of availability-related occurrences and other associated issues, permit ongoing evaluation of the effects of any modifications to all services and resources' performance, availability, and capacity, wherever possible, proactive steps should be taken where they can be justified financially.

Businesses constantly evaluate the quality of their IT services because of how important they are to their operations. In this regard, the Information Technology Infrastructure Library (ITIL) and other best practices for IT service management have defined a few processes for managing IT services and provided a range of KPIs for evaluating each process (Baradari et al, 2021). Additionally, this enables businesses to evaluate and analyze the quality of their IT services using the KPIs. Even though it takes a lot of time and money to evaluate each Information Technology and Infrastructure Library process using the KPIs, organizations are looking for ways to invest in the most effective KPIs to improve their ITSM processes to suit their business needs. There is no

scientific research on ITSM process evaluation, even though there are some studies on process evaluation techniques in other fields. This paper suggests a novel approach to ITSM assessment that uses Information Technology Infrastructure Library KPIs based on established critical success factors (CSF) (Kirilov and Mitev, 2021).

2.6.3.4. Information Asset Management and ITIL

Identification, control, recording, reporting, auditing, and verification of business service assets are the goals of asset management, which is also in charge of maintaining and safeguarding the integrity of service assets by making sure that only approved parts and modifications are utilized. By offering precise configuration data to aid in decision-making and the resolution of issues and incidents, it complements the Information Technology Infrastructure Library processes (UCISA,2014). The study by Moeller (2013) further identifies UCISA, which provides a framework and basic concepts that form the foundation for the creation and maintenance of assets and configurations as part of the principles of service asset and configuration management. As a result, resources are managed to ensure that configuration management and asset operations are continuously monitored, corporate governance requirements, such as software asset management; Services that are cost-effective, dependable, and available are required; shift in emphasis from detecting and fixing to developing a sophisticated system through proactive and predictive methods; Set up a control level to ensure that all requirements for auditing and traceability are met on time; precise asset and configuration management for operations and the service management procedure; introduction of additional automation through cost reduction (UCISA, 2014). .

2.6.3.5. Risk Management and ITIL

Information Technology Infrastructure Library is a framework that aids in determining whether a company needs information security; it sees security as a management issue as well as an IT issue. In essence, to fulfill the following objectives (Moeller, 2013):

- Availability means the timely availability of information and its usability when needed.
- Confidentiality is the practice of allowing only authorized individuals access to information sharing.
- Information that is kept intact, correct, complete, and always protected is referred to as having integrity.
- Authenticity and nonrepudiation pertain to the reliability of all exchanges of information and transactions between companies or business associates.

Hertvik (2017) asserts that IT risk management is an ongoing procedure with a lifespan. It is noted in this study that risk can be found in the Information Technology Infrastructure Library. For the same reason, a framework's service design and continual service improvement are provided in phases. Additionally, the researcher added that the Information Technology Infrastructure Library framework and continuous service improvement practices might help with updating and adhering to the risk management plan for betterment.

2.7. International Organisation for Standardization

To have effective practices which drives efficient IT governance ISO 27002 frameworks should be in place to align the principles and guidelines aimed at enhancing an organization's information security management for organisation success. According to Rusman et al. (2022), the fundamental components of ISO 27001/27002 are based on the following principles: information security, asset management, human resource safety, physical security and the environment, operations and communications management, access control, acquisition, development, and maintenance of information systems, information security incidents; business continuity management; and compliance.

The application of the ISO 27002 standard is crucial for the establishment of efficient IT governance procedures and a thorough set of rules and principles intended to improve an organization's information security management system (ISMS) is provided by ISO 27002. Information security is a crucial part of IT governance for businesses, especially State-Owned Entities (SOEs) which frequently handle sensitive data and function in highly regulated contexts (Calder and Watkins, 2024). A study conducted by Herath, Herath, and Cullum (2023) states that organisations may make sure that their IT systems and procedures are safe, robust, and compliant with global best practices by using the ISO 27002 framework. In addition to shielding the company against online attacks and data breaches this alignment fosters stakeholder trust which guarantees business continuity and the accomplishment of organizational objectives. Rusman et al. (2022) Further assets that IT Governance is supported by the ISO 27002 framework, which offers an organized method for handling information security threats and describes safeguards that companies which they can put in place to protect their information assets, such as data availability, confidentiality, and integrity. These controls are essential for reducing risks like cyberattacks, illegal access, and data loss for SOEs, which frequently oversee key infrastructure and public services. SOEs can proactively identify vulnerabilities, evaluate risks, and put in place the necessary safeguards by incorporating ISO 27002 into their IT Governance framework. In addition to improving the organization's security posture, this proactive approach guarantees regulatory compliance, lowering the possibility of fines and harm to the company's brand.

Moreover, a culture of continuous development is fostered by the ISO 27002 framework, which is crucial for efficient IT governance. In order to handle new threats and evolving business requirements, the framework encourages firms to periodically examine and adapt their information security policies and procedures. For SOEs, this entails keeping up with changing cyber threats and technological developments in order to maintain the stability and efficacy of their IT systems. ISO 27002 helps enterprises maintain high performance, optimize their IT resources, and adapt to new challenges by promoting a culture of continuous development which must strike a balance between the requirements of providing public services and the requirements for operational security and efficiency, this flexibility is essential (Nicho, Khan and Rahman, 2017).

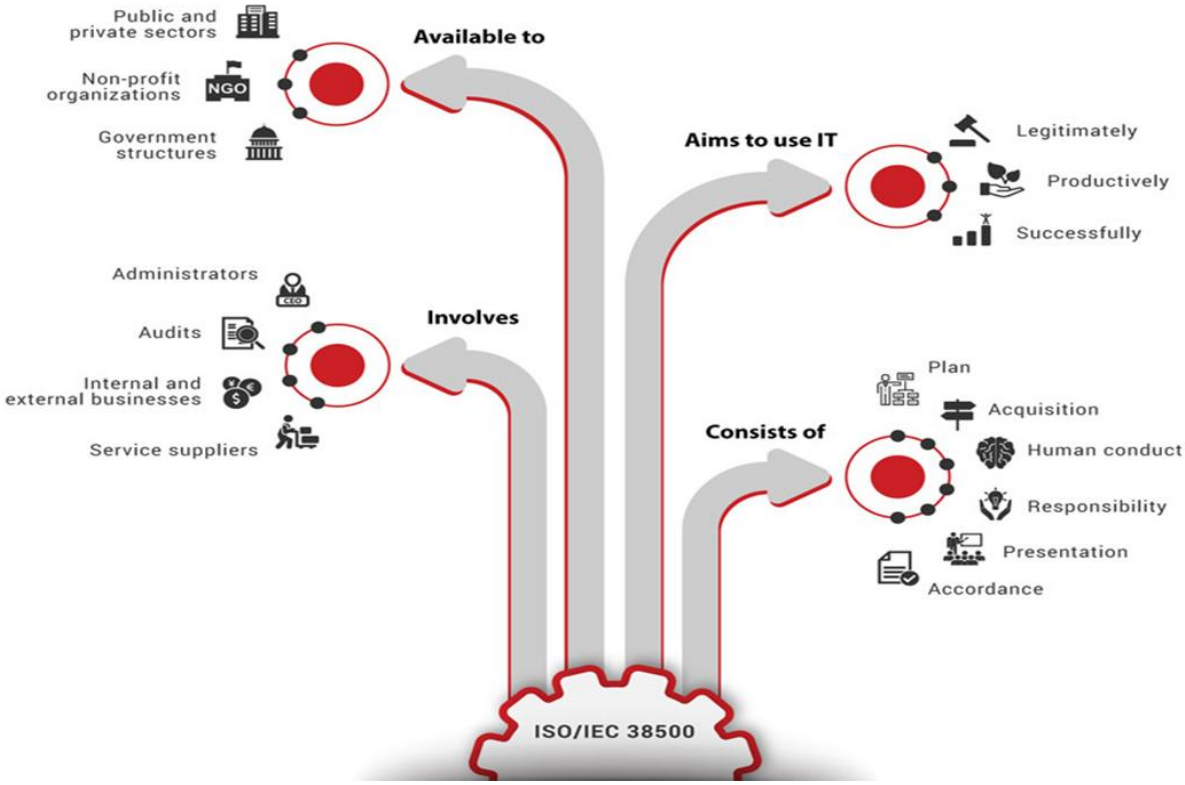


Figure 2.8. ISO/IEC 38500 Framework **Source**: (Professional Evaluation and Certification Board, 2025)

Robalino-López et al. (2019) state that ISO/IEC 38500 offers definitions, principles, and a model to help regulatory authorities understand the importance of information technology (IT). Regardless of the degree of IT use, this standard is intended to help all types of businesses evaluate, direct, and monitor IT use. This standard aims to promote the effective, efficient, and appropriate use of IT in all businesses by establishing an IT governance language, providing information and guidance to governing bodies, and incorporating management practices and decisions on the current and future use of IT.

Joseph (2025) analysed that governing bodies can use ISO/IEC 38500 to ensure that IT enhances an organization's performance. By fulfilling ISO/IEC 38500 requirements, businesses can thereby ensure effective deployment and operation of IT assets, monitor IT usage, and ensure business continuity and sustainability. Furthermore, this standard will help you acquire the knowledge and abilities needed to support businesses in developing, implementing, and constantly improving a

framework that complies with the principles and model for good IT governance set out by ISO/IEC 38500. Aguilar-Alonso and Vergara-Calderón (2020) suggests that it also enables organizations to provide their staff with the necessary skills to manage risks, encourage the use of IT-related possibilities, and stop the incorrect use of IT systems and ISO/IEC 38500 principles. This standard helps the organization understand business strategy, aligns it with IT strategy, and guides best practices for IT governance. while the need for workers with greater expertise keeps rising.

Visitsilp and Bhumpenpein (2021) noted that ISO/IEC 38500 was created to provide guidelines for information technology (IT) governance in businesses. Thus, it offers a framework that assists directors and senior executives in comprehending and carrying out their ethical, legal, and regulatory responsibilities regarding the use of IT. In support of the above Toifur et al. (2022); Azzahra et al., (2024) postulate that in terms of implementation, the standard is not prescriptive; rather, it provides a high-level framework and guiding principles to help make decisions and guarantee that IT complements and advances the overarching business plan. It is especially useful since it emphasizes accountability, performance, and the strategic alignment of IT with business goals while concentrating on the duties of the organization's leadership. The standard lists six fundamental ideas responsibility, strategy, acquisition, performance, conformity, and human behavior that support efficient IT governance.

These rules ensure that all IT-related choices are made with clarity regarding who is in charge, how IT fits with company objectives, why IT investments are made, how well IT operates, whether it complies with internal and external duties, and how it affects people. Businesses can leverage IT to promote value creation, efficiency, and transparency by adhering to these criteria (Zein, 2024).

A governance model built around three essential tasks evaluation, direction, and monitoring, is at the heart of ISO/IEC 38500. It is expected of leaders to assess how IT is being used now and, in the future, guide its use and execution per corporate objectives, and keep an eye on the effectiveness and compliance of IT projects. A proactive approach to IT governance is made possible by these duties, which guarantee risk management, prudent resource utilization, and the realization of strategic benefits (Juiz et al.2018).

Gómez et al. (2017) further suggest that to put it simply, ISO/IEC 38500 pushes businesses to view IT as a vital business asset rather than just a technical task. Organizations may improve decision-making, increase accountability, and guarantee that IT provides maximum value while avoiding harm and inefficiency by incorporating IT governance into corporate governance. Rama and Gunawan (2020) claim that for more thorough instructions on installation and operational management, the standard can be used in conjunction with other frameworks like COBIT or ITIL. Therefore, it has become relevant for this study to address all studies and industries that have adopted the ITIL and COBIT frameworks.

2.8. Recap of the present study and the literature reviewed

The present study examines the combination of digital technology and IT governance to enhance the performance of state-owned entities. The present study highlights the demand on SOEs to enhance operational effectiveness and service delivery in the quickly changing digital economy. However, a lot of SOEs have trouble implementing IT governance properly which makes it difficult for them to successfully integrate new technology. The crucial role that IT governance plays in coordinating technology investments with the organization's strategic goals. Efficient use of resources, proper risk management, and accountability are all guaranteed by effective IT governance frameworks. Given the particular difficulties that SOEs encounter such as budgetary limitations and public accountability a strong governance framework is necessary to manage these difficulties and improve service delivery.

The present study further suggests a number of digital technologies that can greatly enhance SOE's performance, including cloud computing, artificial intelligence (AI), big data analytics, and the Internet of Things (IOT). Better data collecting and analysis are made possible by these technologies, which also simplify procedures, cut expenses and ultimately improve decision-making. Cloud computing for example has some of the benefit in this study such as improvement of storage and accessibility and big data analytics can yield insights that inform strategic choices.

2.9. Findings from the survey of scholarship

The findings from the systematic literature review are that state-owned entities (SOEs) need to use digital technologies guided by a strong IT governance. The findings further confirm that many SOEs have trouble implementing IT governance effectively which makes it difficult for them to successfully incorporate new technology. Strong IT governance frameworks are crucial for matching technology investments with these businesses' strategic goals guaranteeing appropriate resource use, efficient risk management and accountability according to the literature. In order to improve operational efficiency and decision-making capacities inside SOEs the assessment highlights the revolutionary potential of digital technologies including cloud computing, artificial intelligence (AI), big data analytics and the Internet of Things (IoT). It further highlights the need for robust governance frameworks to handle the difficulties faced by SOEs such as financial limitations and the requirement for public accountability. The summarization of numerous studies shows that using digital tools enhances service delivery and streamlines processes which raises citizen satisfaction. All things considered, the literature review successfully makes a crucial connection between digital transformation and IT governance promoting an organised method of combining both components to improve SOE performance in a quickly changing digital environment.

COBIT, ITIL, and ISO frameworks each have unique advantages but also reveal significant shortcomings that compromise their independent efficacy in South African State-Owned Enterprises (SOEs). COBIT excels in strategy alignment, risk management, and auditability, offering a comprehensive process model with explicit control objectives and capability maturity levels. Nonetheless, its roots in the audit sector have cultivated a belief that it serves chiefly as a compliance instrument rather than as an operational facilitator. Moreover, whereas COBIT delineates the "what" of necessary controls, it lacks adequate clarity on the "how" of their implementation, thus necessitating supplementary frameworks such as ITIL for practical execution. In contrast, ITIL excels in IT service management by outlining daily operations such as incident and change management; nevertheless, it does not encompass the strategic governance and board-level accountability that COBIT offers. ISO standards, specifically ISO/IEC 38500 and 27002, provide internationally recognized principles for executive guidance and security;

however, their efficacy relies on a formal culture of compliance and certification, which is often lacking or undervalued in the South African public sector.

The implementation of these frameworks in South African state-owned enterprises is significantly obstructed by a confluence of systemic, leadership, and contextual deficiencies. The principal national framework for ICT governance, the Corporate Governance of ICT Policy Framework (CGICTPF), is an antiquated amalgamation derived from COBIT 5, ISO 38500, and King III, issued in 2012, and its obsolescence indicates that it fails to represent the advancements of its foundational frameworks. This results in a fundamental "framework fatigue": State-Owned Enterprises (SOEs) are mandated to utilize a derivative framework that is already obsolete and lack the internal capability to manoeuvre through the intricate, frequently disjointed, terrain of COBIT, ITIL, and ISO. Implementation issues are chiefly ascribed to insufficient leadership commitment and the failure to regard ICT governance as a strategic priority, resulting in considerable non-compliance and inadequate controls, as consistently highlighted by the Auditor-General. The frameworks are frequently regarded as overly intricate and resource-demanding, with constrained budgets, talent deficiencies, and cultural aversion to change serving as significant obstacles. This creates a conflict between strict compliance and the adaptive flexibility necessary for public sector innovation, rendering the rigid, uniform application of these worldwide standards not only challenging but also counterproductive within the South African SOE context

2.10. Summary of the chapter

This chapter surveyed the scholarship by reviewing existing literature that gave the present study a foundation. The relevant key concepts were reviewed. That is, the chapter was a Systematic literature review of key terms and concepts. It discussed practice frameworks such as COBIT, ITIL, ISO as well as related works. Theoretical frameworks underpinning the present study are described in the next chapter.

CHAPTER THREE: THEORICAL FRAMEWORKS AND THE CONCEPTUAL RESEARCH FRAMEWORK

3.1. Introduction

The preceding chapter surveyed the existing scholarship and reviewed concepts that gave foundation to the present study. This chapter synthesise, analyse, and critique theories underpinning the study and the Conceptual research framework is then given. The chapter articulates elements chosen from the theories and the literature, which guides this study and argument. The conceptual research framework informed the collection and analysis of data. These elements of the conceptual research framework are essentially as the themes and subthemes were what was studied.

In Information Systems research field, information technology (IT) implementation and governance in organizational contexts, especially in State-Owned Entities (SOEs), can be analyzed using structured theoretical frameworks such as the Unified Theory of Acceptance and Use of Technology (UTAUT), Upper Echelon Theory and Diffusion of Innovations (DOI). By providing distinct viewpoints on the ideas, procedures, and techniques that support efficient IT governance and the use of digital technologies, a theory can help organizations to better allocate resources, reduce operational risks, and match IT strategy with business goals.

3.2. Theories underpinning the study

Information systems (IS) theories offer organized frameworks for comprehending, forecasting, and elucidating how technology affects people, organizations, and society. They aid in the analysis of user adoption patterns, the reasons behind the success or failure of technologies, and how IS affects corporate procedures and decision-making.

Theories in information systems can be descriptive (describing the situation), predictive (predicting how technology will be used), or prescriptive (directing system design). They are essential for developing user-friendly solutions, boosting organizational effectiveness, and promoting digital transformation. Businesses can improve technology adoption, streamline processes, and accomplish strategic objectives by putting these beliefs into practice. Information Systems theories are essential resources for comprehending the intricate interrelationships among technology, people, and organizations; they influence both scholarly study and practical applications. The underpinning theories are discussed next.

3.2.1. Diffusion of Innovation Model

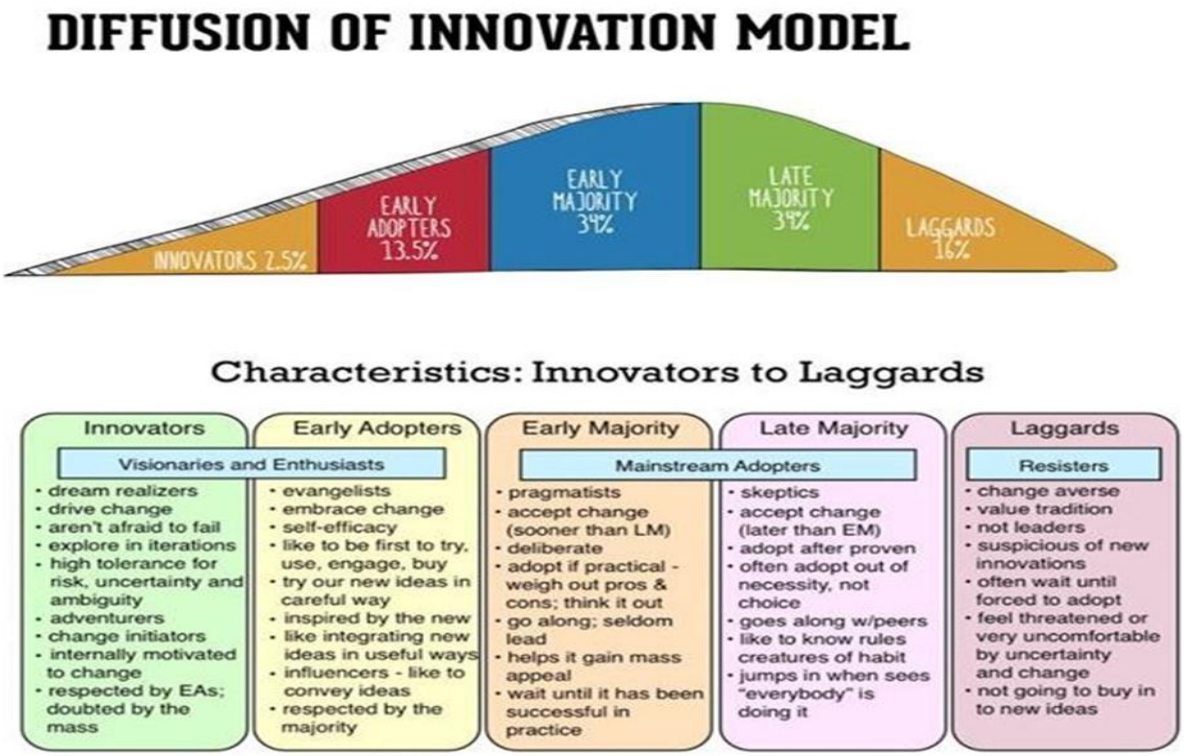


Figure 3.1. Diffusion of Innovation Model (DOI) **Source:** (Mathur and Verma, 2014).

Mathur and Verma (2014) posit that Diffusion of Innovations (DOI) theory, which was created by Everett Rogers in 1962, provides a fundamental framework for understanding how, why, and how quickly novel concepts, innovations, or methods proliferate over time within social systems.

Alam et al. (2018) elucidate that DOI is essential as it aids in the understanding and management of the adoption process of new practices or technology by organizations and policymakers. Adopter categories and innovation qualities (such as relative advantage, compatibility, and complexity) can be analyzed by stakeholders to create focused tactics that will overcome resistance and accelerate diffusion. In public health, for instance, DOI directs immunization campaigns by customizing messaging for various adopter groups. It helps businesses launch new products by making sure early adopters are enlisted first to generate momentum. Proactive solutions are made possible by the theory's identification of adoption hurdles such perceived complexity and lack of observability.

Everett Rogers' (1995) Diffusion of Innovation theory, which Alkhalil, Sahandi, and John (2017) support and explains how new technology progressively seeps into social institutions. Along with adoption-influencing factors like relative advantage, compatibility, trialability, complexity, and observability, five adopter categories are identified: innovators, early adopters, early majority, late majority, and laggards. As a result, this concept helps companies plan how to implement and roll out new technology.

Dai et al. (2021) highlighted that the five adopter categories at the core of the Diffusion of Innovation model vary in terms of their quickness and willingness to embrace new technologies. Because they are daring and willing to take chances, innovators are the first to adopt a new idea. Furthermore, the early adopters, who are well-respected opinion leaders and have a significant impact on others, come next. The late majority, who are more skeptical and adopt until after a majority has embraced the innovation, follow the early majority, who embrace new ideas shortly before the public. The last to embrace are the laggards, who frequently oppose change and stick to tried-and-true techniques.

In support of the above, Amini, and Bakri (2015) further state that the rate of invention diffusion is influenced by several factors. Among these are the innovation's relative advantage (how much better it is than what it replaces), compatibility with current values and practices, complexity (how simple it is to use and comprehend), trialability (how simple it is to test or experiment with), and observability (how obvious the benefits are to others). As it is also strongly influenced by the social system's features, the time it takes for acceptance, and the way knowledge about the invention is disseminated. As stated by (Alam et al. 2018), adoption is a process that involves knowledge, persuasion, decision-making, implementation, and confirmation, according to the Diffusion of Innovation model. Organizations and change agents can more effectively customize methods to encourage innovation, remove obstacles, and facilitate broad adoption by having a deeper grasp of this process. The model emphasizes the significance of both the invention and the environment in which it is presented.

3.2.2. Unified Theory of Acceptance and Use of Technology

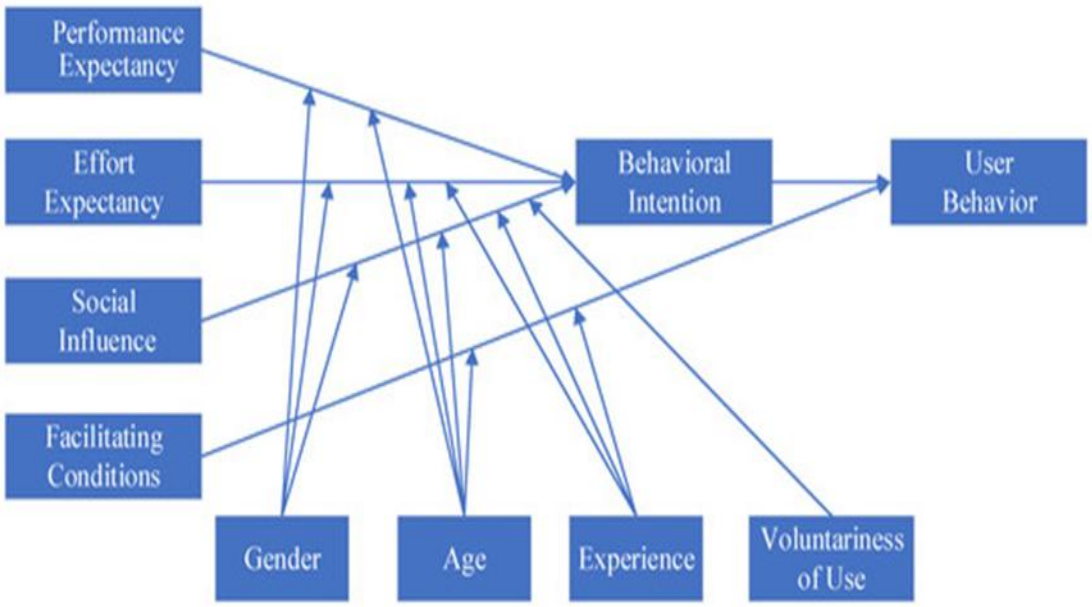


Figure 3.2. Unified Theory of Acceptance and Use of Technology **Source:** (Momani, 2020).

Venkatesh et al. (2003) created the Unified Theory of Acceptance and Use of Technology (UTAUT) as a comprehensive model to describe how users accept and embrace new technology. Using a variety of elements to create a cohesive framework, UTAUT builds on previous theories such as the Technology Acceptance Model (TAM). The four main factors identified by the model are social influence (the effect of other people's opinions), performance expectancy (the perceived usefulness of the technology), effort expectancy (the perceived ease of usage), and enabling conditions (the resources and assistance that are readily available). Furthermore, UTAUT considers moderating variables that affect these determinants, such as age, gender, experience, and voluntariness of usage.

Venkatesh (2016) suggests that to forecast technology adoption, UTAUT incorporates components from several IS theories, such as TAM and DOI. Thus, performance expectancy, effort expectancy, social influence, and conducive conditions are the four main factors that are identified. This model

is expanded for consumer situations by UTAUT2, which incorporates elements such as price value, habit, and hedonic drive.

Dwivedi et al (2019) adds that UTAUT provides a more comprehensive understanding of technology adoption, which unifies disparate ideas from past theories into a unified, empirically supported paradigm. Since UTAUT takes organizational and social circumstances into account, it is particularly beneficial for real-world applications, in contrast to models that only consider perceived usefulness or ease of use. UTAUT, for instance, can explain why workers may oppose the use of new software in the workplace as a result of peer skepticism (social influence), a lack of IT assistance (facilitating conditions), or the software's complexity (effort expectancy).

Momani (2020) noted that integration of elements are from eight earlier theories, including the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the Innovation Diffusion Theory (IDT), to provide a more thorough framework for understanding technology uptake. Therefore, the factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions have become the four main determinants of technology acceptance identified by UTAUT, in addition to four moderating factors like gender, age, experience, and voluntariness of use that impact the relationship between these factors and user behavior (Williams et al. 2015).

Performance expectancy, according to Dwivedi et al (2019), is the degree to which a person thinks that utilizing technology would improve their performance at work. This construct is frequently the best indicator of technology adoption and is comparable to perceived usefulness in TAM. Additionally, Venkatesh et al. (2015) support that they are like perceived ease of use in TAM, as effort expectancy gauges how simple a technology is thought to be to use. Regardless of a system's possible advantages, consumers are less likely to accept it if they find it difficult to use. Strzelecki (2024) explains that the degree to which users believe that significant others, like peers or superiors, think they should utilize the technology is captured by social influence. Therefore, this element is especially important in corporate environments where acceptance may be influenced by peer pressure or managerial support. In this study, the degree to which a person believes that there

is organizational and technological infrastructure such as training, IT support, and resource availability to enable technology use is measured by the facilitating conditions.

Nair et al. (2015) elucidate that moderating elements that modify how the basic determinants affect behavior are also incorporated into UTAUT. Furthermore, Age and gender frequently mitigate the effects of performance and effort expectancy; for example, older women may place greater emphasis on usability, whereas younger males may prefer performance benefits. Gümüşoğlu and Akay (2017) emphasise that as users gain more familiarity with the system, their reliance on effort expectancy gradually decreases. As the extent of social influence is determined by the voluntary nature of use, in situations where adoption is optional, social pressure may exert a greater influence than in forced contexts. The concept has been widely used to improve technology adoption in a variety of fields, such as business, education, and healthcare. Because of its comprehensive approach, it is a useful tool for practitioners and researchers who want to better understand and enhance user interaction with emerging technologies.

3.2.3. Upper Echelon theory

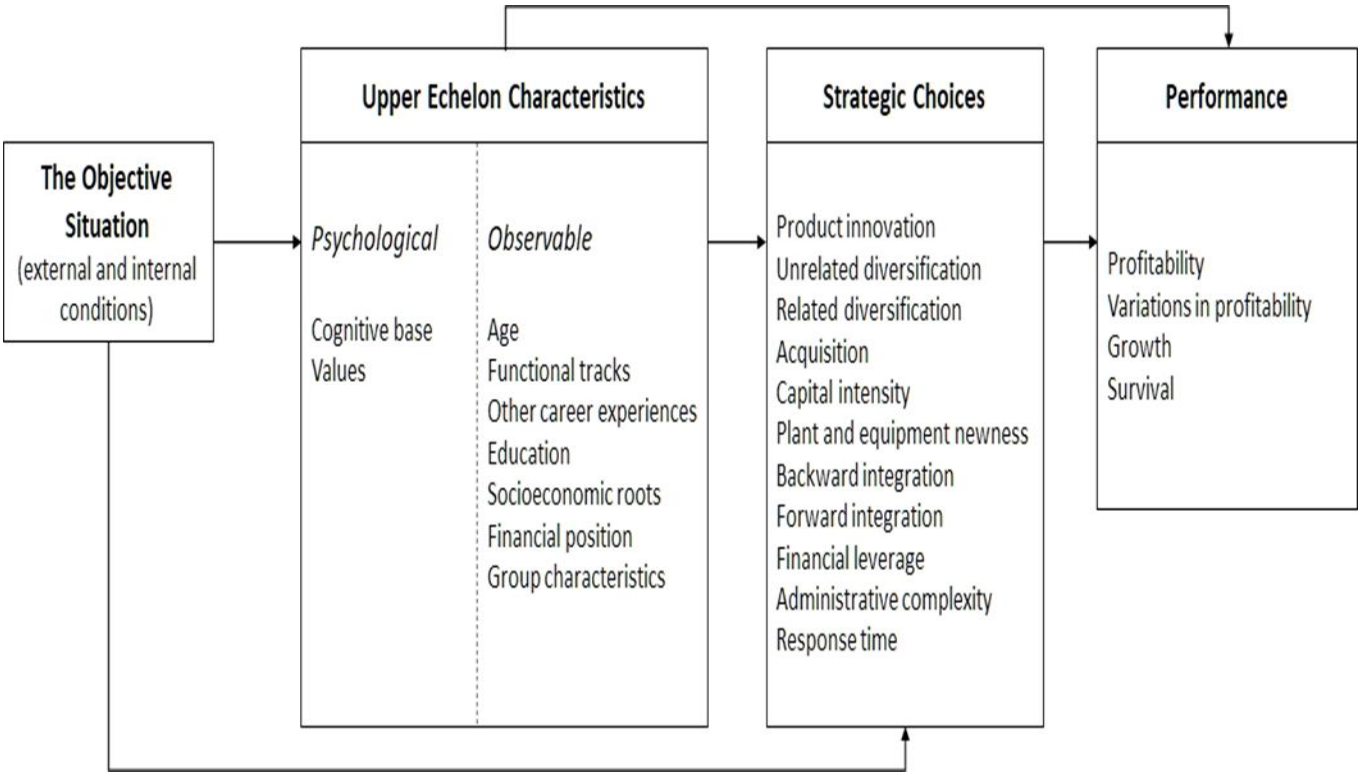


Figure 3.3. Upper Echelon theory Conceptual Model **Source**: (Plöckinger et al. 2016)

The management framework known as Upper Echelon Theory (UET) was created in 1984 by Donald Hambrick and Phyllis Mason, which asserts that the psychological profiles and background traits of top executives have a major impact on organizational outcomes, such as performance and strategic decisions.Yamak et al (2014) and Liu (2023) state that according to the theory, the experiences, values, personalities, and cognitive foundations of senior leaders influence how they perceive the world and make decisions, which in turn impacts the organization. UET stresses that executives behave according to their own "field of vision," which is filtered by their education, work history, socioeconomic background, and other demographic characteristics. This contrasts with traditional theories that concentrate on external influences or logical decision-making models. The theory is especially pertinent to comprehending corporate governance, organizational behavior, and strategic leadership in intricate commercial settings.

Carpenter (2004) suggests that fundamentally, UET contends that observable management traits like age, tenure, education, functional background, and socioeconomic origins have an impact on organizational outcomes like innovation, strategic change, risk-taking, and overall success. These factors act as stand-ins for more profound psychological characteristics that are frequently challenging to quantify precisely. A CEO with a background in finance, for instance, would place greater emphasis on risk minimization and cost control, whereas a younger CEO might be more willing to take chances and pursue ambitious growth initiatives.

According to conducted studies such as Bromiley and Rau (2016); Kokot et al. (2021); McCants (2024) the bounded rationality of executive-level decision-making is emphasized by the theory. Furthermore, executives can't process all information objectively in complicated and uncertain circumstances. Thus, they consequently use their cognitive models, which are influenced by their personal biases, professional paths, and life experiences to filter information and make strategic decisions. These filters have an impact on the problems that are identified, their interpretation, and the solutions that are taken into consideration.

Scholars have investigated the impact of top management team (TMT), and the idea has been extended throughout time by including differences in age, educational attainment, and functional competence, on strategic decision-making which is addressed by Đerđa (2017). Abatecola and Cristofaro (2020) assert that a diversified TMT can offer a wider variety of viewpoints and concepts, potentially boosting creativity and flexibility. But if not handled properly, it can also result in disagreements or delayed decision-making. Another important element in determining strategic directions is the relationship between the Chief Executive Officer and the larger executive team.

Yamak et al. (2014) and Perkins and Shortland (2024) provided a better understanding of Echelons theory which contains some drawbacks despite its rewards. As a result, critics contend that the intricacy of human behavior is oversimplified when demographic indicators are used as stand-ins for psychological features. Furthermore, the theory frequently fails to take into consideration outside variables that can significantly affect organizational outcomes apart from managerial

characteristics, such as market conditions or regulatory settings. However, UET continues to be a fundamental theory in organizational behavior and strategic management, providing important insights into how leadership affects an organization's course.

3.2.4. Benefits and drawbacks of Upper Echelon Theory, DOI, and UTAUT

The table below provides a comparative analysis of three main theoretical frameworks utilised in management and information systems research. The Unified Theory of Acceptance and Use of Technology (UTAUT), the Diffusion of Innovations (DOI) theory, and the Upper Echelon Theory (UET). By providing a succinct summary of each's ability to explain organisational outcomes, the adoption of new ideas, and individual technology acceptance, the following table methodically outlines the main advantages and inherent disadvantages of each, emphasising both their special uses and limitations for scholars and practitioners.

Table 3.1. Outlining the benefits and drawbacks of Upper Echelon Theory, DOI, and UTAUT

Theory	Advantages	Disadvantages
UTAUT (Unified Theory of Acceptance and Use of Technology)	• Comprehensive incorporates over eight models • Incorporates moderators (experience, gender, and age). • Adaptable to different industries	• Western prejudice; cultural adjustment may be necessary • A static perspective on adoption procedures
DOI (Diffusion of Innovations)	• Wide-ranging relevance (tech, policies, behaviours) • Determines adopter groups to target • Useful design insights, such as trialability and compatibility	• Frequently retrospective as opposed to predictive • Adoption is oversimplified as linear, and • Individual psychology is ignored.
Upper Echelon Theory	• Describes the strategic impact of leadership • Draws attention to how diversity affects teams • Beneficial for succession planning and governance	• Demographics are used as cognitive indicators • Places too much emphasis on executive influence • CEO effects are difficult to separate.

3.3. Conceptual research framework

Following a discussion of the three theories underpinning the study in the previous section, the conceptual research framework that served as the study's guide is provided below. The conceptual research framework gives a high-level overview of components that comprise IT governance, digital capabilities, and performance capabilities as a social activity system. Figure 3.4 below.

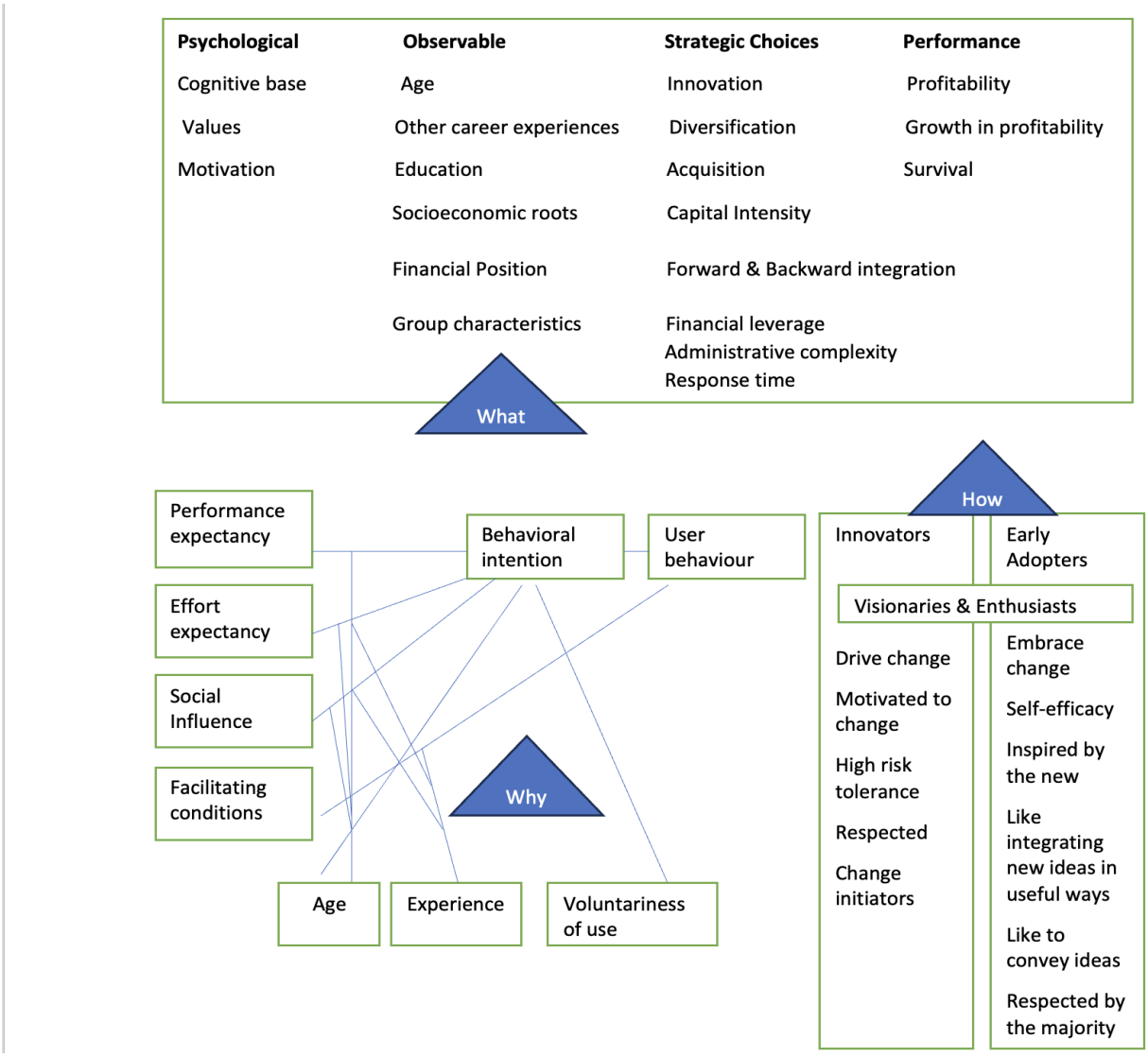


Figure 3.4. Conceptual research framework illustrating the studied social activity system

Three key areas IT governance, Digital Technologies, and Performance Capabilities are combined in this conceptual research framework to create a synergistic social activity system in which each component is dynamically interconnected and guided by a particular anchoring theory. By elucidating the rate, patterns, and perceived features (such as relative advantage and complexity) that govern their acceptance inside the company, the Diffusion of Innovation (DOI) Theory provides the fundamental "push" for digital technologies. The Unified Theory of Acceptance and Use of Technology (UTAUT), which describes the "mediating pull" by simulating how performance expectations, facilitating conditions, and social influences within the governance structure either facilitate or impede effective technological implementation, then directly shapes the integration of these technologies.

The Upper Echelon Theory, which holds that the final "orchestration" and realization of performance gains are filtered through the strategic choices, experiences, and cognitive bases of the organization's top management, which is in charge of aligning the governed digital portfolio with the entity's distinct strategic objectives, explains how this governed adoption ultimately aims to improve Performance Capabilities. Therefore, Upper Echelon Theory explains the function of strategic leadership in transforming that use into concrete performance capabilities, DOI explains the technological innovation, and UTAUT explains the organizational and governance mechanics of its use.

3.4. Summary of the chapter

State-Owned Enterprises (SOEs) cannot attain transparency, accountability, and performance optimization in their information technology use without effective IT governance framework. A thorough grasp of the structural and behavioral aspects of IT governance and the use of digital technologies can be obtained by triangulating theoretical lenses like Diffusion of Innovation theory (DOI), Upper echelon theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT).

Upper Echelon Theory asserts that organizational outputs, such as governance goals and digital strategy, predominantly mirror the values, cognitive biases, and experiences of senior leaders. This thesis elucidates that in the realm of state-owned entities, IT governance is not merely a rational or technical endeavor but is influenced by the interpretive perspectives of boards and top management. If executives regard IT governance mainly as a compliance obligation, strategic alignment will be compromised; but, if they consider digital transformation a competitive need, they will advocate for agile governance frameworks. The idea emphasizes that demographic characteristics, including age, educational background, and career history, affect leaders' prioritization of risk against innovation, thereby influencing the actual or symbolic implementation of governance frameworks like as COBIT or ITIL. Nonetheless, its constraint in state-owned enterprises lies in political appointments and frequent leadership changes, which can disrupt strategic continuity, splinter governance agendas, and undermine long-term digital plans.

The Diffusion of Innovations (DOI) Theory offers a framework for comprehending the dissemination or stagnation of new digital technologies inside the intricate, hierarchical structures of State-Owned Entities (SOEs). The rate and extent of adoption, as per DOI, are contingent upon perceived features like relative advantage, compatibility with current procedures, complexity, trialability, and observability. In South African state-owned entities, innovations frequently fail to disseminate due to their apparent incompatibility with inflexible bureaucratic processes or the lack of convincing demonstration of their respective advantages amid financial limitations. The idea underscores the significance of communication channels and social systems, indicating that adoption is not uniform; early adopters within a State-Owned Entity (SOE) may advocate for technology, yet their impact is diminished if middle management opposes or if formal hierarchies inhibit peer-to-peer information exchange. The lack of committed change agents and insufficient user training exacerbates the issue, hindering the S-curve of adoption and frequently resulting in innovations remaining in pilot phases without attaining critical mass within the business.

The Unified Theory of Acceptance and Use of Technology (UTAUT) provide a detailed framework to elucidate how various organizational members, from frontline employees to department leaders, embrace, utilize, or oppose digital technology under different enabling contexts. The model delineates four primary determinants: performance expectancy (perceived job advantages), effort expectancy (ease of utilization), social influence (peer and managerial pressure), and facilitating conditions (technical infrastructure and support), all moderated by gender, age, experience, and voluntariness of use. In SOE environments, resistance frequently arises when performance anticipation is diminished due to legacy systems rendering new tools superfluous, or when effort expectancy is elevated due to insufficient digital literacy within an elderly workforce. Social influence can be paradoxical: although authoritative directives may ensure initial adherence, authentic acceptance diminishes without strong supporting conditions such as dependable internet, assistance services, and intuitive interfaces. Significantly, UTAUT indicates that voluntariness is frequently lacking in state-owned entities (SOEs) due to coercive policy frameworks, which may lead to cosmetic compliance instead of genuine engagement, eventually compromising the transformative potential that governance changes aim to achieve.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

The previous chapter discussed the theories underpinning the study and provided the conceptual research framework. This chapter outlines the research methodology followed in conducting the present study. The chapter describes how the research philosophy, strategy and approach were applied as well as data collection methods, analysis, and targeted population.

4.2. Epistemology and Ontology

Ontological realism, critical realism highlights the significance of epistemological relativism (Yucel, 2018). It recognises that our understanding of this reality is constantly incomplete, context-dependent, and influenced by theoretical frameworks (epistemology), even if it maintains that there is a mind-independent reality (ontology). It has been noted that by adopting this viewpoint, scholars can critically assess conflicting theories of social phenomena while remaining dedicated to identifying the true mechanisms behind them (Albert, 2020). Critical realism would look for the most likely causal mechanisms, considering both empirical data and theoretical coherence, even when various theories may explain lack in terms of personal decisions or institutional inequity.

4.2.1. Epistemology

The core notion of epistemology is that knowledge is jointly created through conversation, engagement, and life experiences. This approach emphasizes qualitative techniques, such as in-depth interviews, ethnographic observations, and case studies, to reveal the underlying meanings, motives, and social practices that drive IT governance rather than depending on objective, detached assessment as positivism does. It could be investigating how managers, staff members, and IT specialists understand and implement governance policies in their day-to-day work would be one way to examine how IT governance frameworks impact decision-making. The objective is to offer

deep, situation-specific insights that highlight the complexity of organizational and human behavior, not to generalize findings. through accepting subjectivity and other points of view (Yucel, 2018).

4.2.2. Ontology

Naz, Gulab and Aslam (2022) asserts that Ontology is based on the idea that reality is a subjective, socially produced phenomenon rather than an objective, constructed thing. According to this viewpoint, there are several realities that are influenced by personal experiences, cultural settings, and shared meanings among groups. In distinction from positivism, which looks for universal truths. This indicates that in IT governance and digital technologies, elements such as resource allocation, decision-making procedures, and innovation are impacted by situational dynamics, organisational culture, and human interpretations rather than being governed by unchangeable laws. Depending on leadership styles, staff attitudes, and past experiences, what one organisation considers to be "effective" IT governance may differ greatly from another.

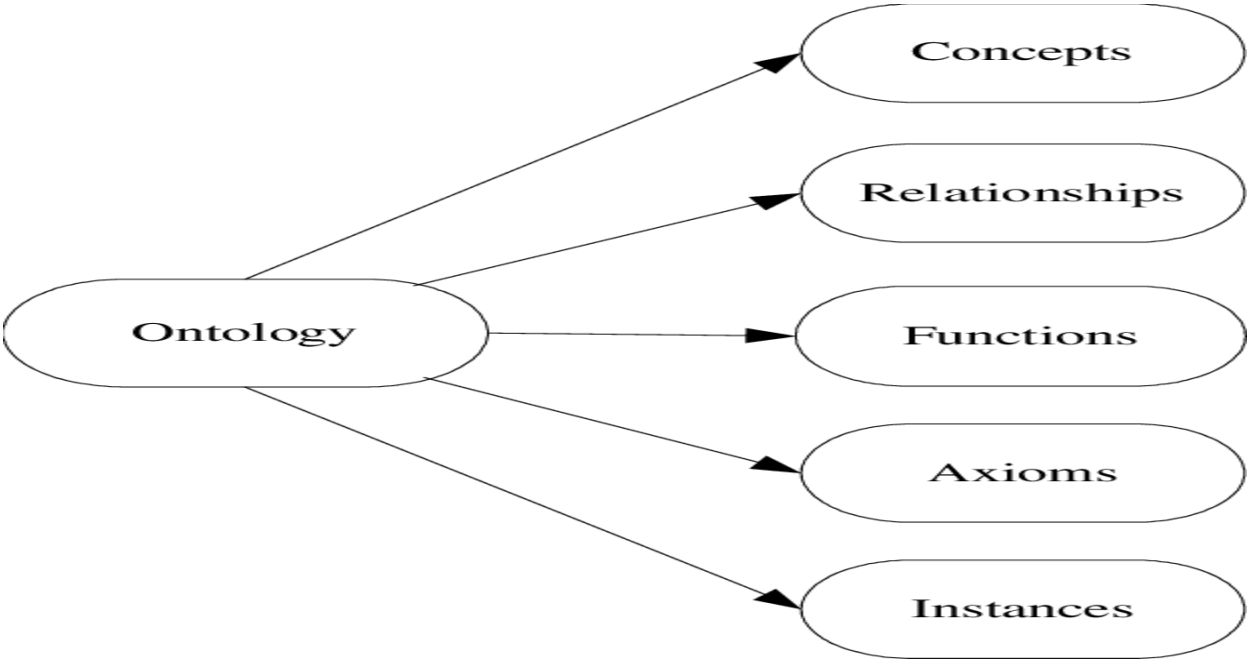


Figure 4.1. Main components of an ontology. **Source:** (Gómez-Pérez, 1999)

4.3. Research Philosophy

The interpretive research philosophy, which underpins this work, is consistent with the subjective character of qualitative investigation and the investigation of human experiences. According to interpretivism, knowledge is obtained by understanding the meanings people ascribe to their experiences, and reality is socially created (Saunders et al., 2012).

The use of in-depth interviews in this study made the interpretive technique especially appropriate because it allows a comprehensive analysis of the viewpoints, convictions, and life experiences of the participants instead of depending only on surface-level data. The present study was able to explore the subjective meanings and subtle understandings that the study participants ascribed to their experiences using an interpretive method. This approach made it possible to conduct a thorough, contextually grounded analysis that captured the richness and nuance of the participants' perspectives. Additionally, Lin (2025) highlights the importance of personal narratives and social circumstances, the interpretive framework supported the goals of the study and offered a more comprehensive understanding of the phenomena being studied; therefore, the technique not only improved the trustworthiness of the findings' but also ensured that participant voices were at the center of the study conclusion (Tan, 2018).). The present study was able to provide a comprehensive picture of how these components work together to improve performance capacities in SOEs by giving priority to the lived experiences of the participants. This helped advance theory and practice in this developing area.

A research philosophy, according to Bryman (2012) and Naz, Gulab and Aslam (2022) is a collection of ideas about the nature of the reality under investigation. Furthermore, positivism and constructionism are two main ontological frameworks that can guide the study process. The actuality occurs independently of the subject of the study and individually, according to positivist philosophy (Maretha, 2023). This implies that the meaning of the occurrences, including the focus, remains consistent during preparation.

The present study supports constructivist ideas, which state that discussion and mutual understanding produce meaning. The interview procedure itself was a meaningful-making exercise in which the study interactions with the participants influenced their responses. This dynamic

emphasizes how crucial context is to qualitative research, since results are not just facts; they are intricately woven into the social and experiential lives of participants (Lim, 2025,). Ultimately, Yin (2009) discovered that research philosophy supports the use of qualitative techniques and affirms the importance of interview data in examining complex, individualised phenomena. Eventually, it highlights the limitations of the study, stating that the results are interpretive rather than conclusive, and it encourages readers to interact with the insights while considering the circumstances in which they were generated.

The selected research philosophy for the present study has significant implications for assessing the reliability of the study. The study used Creswell and Guetterman's paradigm (2019) of credibility, transferability, dependability, and confirmability instead of conventional validity criteria. This approach aligns with the study's emphasis on comprehending how perceptions, lived experiences, and organisational dynamics influence how digital technologies and IT governance work together to improve performance capabilities. Furthermore, philosophy influences the formulation of constraints as inherent qualities of research that embrace complexity and diverse truths, rather than as shortcomings (Tan, 2018). Ultimately, this method yields valuable results; however, they are not generalisable because of their depth of understanding. The present study's ontological stance accepts relativism, recognising that the social phenomena they are studying may have several equally legitimate interpretations. The interview data, where various individuals may provide differing viewpoints on comparable situations, make this very clear (Vu, 2021). These disparities are seen as important insights into the complexity of human experience, rather than as inconsistencies that need to be reconciled.

4.3.1. Positivism

Maretha (2023) defines positivism as a research paradigm that is rooted in the belief that knowledge ought to be founded on quantifiable, objective, and observable facts. By focusing on actual data, hypothesis testing, and the application of quantitative techniques to identify general rules controlling social phenomena, it is consistent with the natural sciences. By assuming that reality is external, unchanging, and unaffected by the observer, positivists seek to eradicate

prejudice through surveys, controlled experiments, and statistical analysis. This paradigm, which frequently looks for causal linkages to forecast and explain human behavior, values objectivity, generalisability, and reproducibility.

Saunders et al., (2019) further adds that since positivism ignores cultural backgrounds, subjective experiences, and the role of interpretation, critics contend that it oversimplifies complicated social realities. Notwithstanding these drawbacks, positivism continues to have sway in disciplines that value organised, data-driven methods, such as psychology, economics, and public health. Its emphasis on methodical investigation and accuracy still influences scientific study, especially when it comes to investigations that call for quantifiable results and extensive comparisons. However, to overcome positivism's shortcomings in expressing the complexity and depth of human experiences, alternative perspectives have evolved, such as interpretivism or critical theory.

4.3.2. Interpretivism

According to the interpretivism research paradigm, social reality is the result of human interpretation and interaction rather than an objective fixed entity. The present study followed the interpretivism paradigm. Denzin and Lincoln (2018) posit that interpretivism paradigm is particularly well suited when examining intricate social phenomena where human behaviour cannot be boiled down to only numerical data and places a strong emphasis on comprehending people's subjective interpretations and experiences concerning their social surroundings. In contrast to positivism, which looks for objective facts, interpretivism recognises that reality is shaped by human views and is socially produced (Bryman, 2016). Considering the present study's emphasis on information technology governance, a interpretivist methodology was thought to be suitable to capture the intricacy of participants' views and the diverse interpretations (Gulati et al., 2023). To ensure a deep, contextually grounded understanding of the phenomenon being studied, data-gathering techniques, including in-depth interviews, were used to delve into the participants' viewpoints. The emphasis of the paradigm on depth rather than generalisability matched the present study's objective of revealing the underlying motives, beliefs, and social dynamics.

The table below provides clarity on Interpretivism and Positivism.

Table 4.1. Positivism and Interpretivism Summary Grid. **Source:** Tamminen and Poucher (2020)

Positivism	Interpretivism
Relationship between society and the individual	
Society shapes the individual - *'Society consists of 'social facts' which exercise coercive control over individuals'* People's actions can generally be explained by the social norms they have been exposed to through their socialisation.	Individuals have consciousness and are not just puppets who react to external social forces as Positivists believe. Individuals are intricate and complex and different people experience and understand the same 'objective reality' in different ways
General focus of social research	
The point of research is to uncover the laws that govern human behaviour, just as scientists have discovered the laws that govern the physical world. Prefer quantitative methods which allow for the researcher to remain detached from the respondents.	The point of research is to gain in-depth insight into the lives of respondents, to gain an empathetic understanding of why they act in the way that they do. Prefer qualitative methods which allow for close interaction with respondents.
Preferred research methods	
Quantitative Require research to be valid, reliable and representativeness	**Qualitative** Prepared to sacrifice reliability and representativeness for greater validity

The present study was able to capture the complex ways in which digital technologies and IT governance interact to influence organizational performance using these interpretive criteria. In addition to validating the lived experiences of the participants, this method provided policymakers and SOE leaders navigating digital transformation with useful insights. Interpretive research was therefore crucial in identifying the institutional and human factors that affect how well technology and governance are integrated in public sector organizations.

Interpretivism's core principle is that knowledge depends on context, which means that to understand the subtleties of participants' experiences, researchers must fully immerse themselves in their worldviews (Sanhueza et al., 2008). To conduct a more thorough investigation of motives, beliefs, and cultural influences, Saunders and Bezzina (2015) postulate that social science should

place more emphasis on empathy than causal explanations. Furthermore, when examining new and developing topics like digital governance, interpretive research acknowledges the researcher's role as an active participant in knowledge formation. The present study produced contextually grounded, theoretically and practically applicable conclusions by reflexively engaging with participants' narratives. For SOEs, which frequently operate under certain political and economic limitations that impact their digital transformation journeys, this is especially beneficial. In the end, the interpretive method guarantees that the results are not just descriptive but also profoundly analytical, providing practical suggestions for improving IT governance and developing digital capabilities in SOEs.

4.4. Research Approach

Tisdell, Merriam and Stuckey-Peyrot (2025) stated that any research approach is the general strategy or structure that directs the planning, execution, and interpretation of a study. Therefore, this study's research objectives established the techniques for data collection and analysis, thus directing the course of the study. Also, whether the objective of the study is to test preexisting ideas, investigate novel phenomena, or identify workable answers to real-world issues will determine the methodology. This has been supported by Ganesha and Aithal (2022) that deductive, inductive, and abductive are the three primary methodologies that researchers usually use; each has unique traits and uses.

A deductive approach is a top-down, theory-driven methodology in which the researcher starts with a broad theory or hypothesis and then uses empirical observation to test it. This strategy is frequently employed in quantitative research to support or refute predetermined hypotheses using organised techniques, such as surveys or experiments. For example, using psychological theories and collecting statistical data, a study could examine whether increased screen time lowers sleep quality. Since the deductive method is methodical and disciplined, it is perfect for research projects that aim to confirm pre-existing knowledge rather than develop novel theories (Creswell,2009).

On the other hand, the inductive approach follows an exploratory bottom-up methodology, beginning with particular findings and progressively expanding on them to create more comprehensive ideas or generalizations (Creswell and Inoue, 2023) In the present study, a qualitative method was used for data collection, as this method is often used to identify patterns and themes using focus groups, open-ended interviews, and case studies. A descriptive report that summarises and interprets interviews and observations is the foundation of qualitative research. An inductive method was determined to be the most appropriate since it permits themes and frameworks to naturally arise from interviews, papers, or case studies, as the intersection of digital technologies and IT governance in SOEs is a developing field. Armour and Williams (2022) emphasize that qualitative research frequently involves careful participant observation and interviews to gather more information regarding participants' comprehension of the subject being studied. "Qualitative methods are methods that examine various philosophical hypotheses," according to (Creswell, 2009).

In contrast, Daniel (2018) asserts that the abductive method focuses on determining the most likely explanation for an unexpected observation by combining aspects of induction and deduction. When starting with an unfinished or unexpected discovery, researchers employ this method to find the optimal interpretation by weighing fresh information against preexisting ideas. In disciplines where professionals must make well-informed decisions based on the evidence at hand, such as medicine, criminal investigations, and commercial problem solving, this approach is frequently used. Abductive reasoning could be used, for example, by a physician who identifies a rare disease by examining symptoms, excluding potential causes, and determining the most likely explanation (Bryman, 2016).

Creswell (2018) claims that a quantitative research technique is a methodical empirical examination that uses numerical data and statistical analysis to look at links, patterns, and cause-and-effect dynamics within a population or phenomenon. Quantitative research places more emphasis on measurement, generalisability, and objectivity than qualitative research, which is more concerned with subjective interpretations. Variables are operationalised to enable accurate measurement in this strategy, which usually involves structured data collection techniques such as surveys, experiments, or secondary data analysis (Yin, 2009).

Table 4.2: Qualitative and quantitative methods' distinctions. **Source**: (Thomas, 2010)

Orientation	Quantitative	Qualitative
Assumption about the world	A single reality, i.e., can be measured by an instrument.	Multiple realities
Research purpose	Establish relationships between measured variables	Understanding a social situation from participants' perspectives
Research methods and processes	procedures are established before study begins; - a hypothesis is formulated before research can begin; - deductive in nature	flexible, changing strategies; - design emerges as data are collected; - a hypothesis is not needed to begin research; - Inductive in nature.
Researcher's role	The researcher is ideally an objective observer who neither participates in nor influences what is being studied.	The researcher participates and becomes immersed in the Research/social setting.
Generalisability	Universal context-free Generalizations	Detailed context-based generalizations

4.5. Research strategy

Saunders et al. (2023) define a research strategy as "the common strategy of in what way the researcher answers the research questions" It can include several approaches, as it has to do with how the researcher intends to conduct the work. It is selected based on research objectives and questions. It can include approaches such as case study research, surveys, action research, grounded theory, ethnography or experimental research. The present study employed a case study strategy as the most feasible and suitable considering the resources of the research project. A case study strategy entails a thorough, multidimensional examination of one intricate occurrence or a limited number of examples (a multiple-case study) in the setting of actual life. This approach, which aims to provide "how" and "why" answers to current occurrences over which the researcher has little to no control, is especially useful when it is difficult to distinguish the borders between the phenomenon being studied and its context (Creswell, 2009).

To gain a comprehensive, contextualized understanding of a complicated real-world event, this study used a qualitative, single instrumental case study methodology. Since it thoroughly examined a single, constrained system a particular South African State-Owned Entity to examine the complex interactions between IT governance, digital technologies, and performance capabilities within its real-world setting, the study is categorized as a case study. This study is an explanatory case study since its main goal was to clarify the underlying "how" and "why" of controlling digital convergence for performance outcomes rather than just describing them. The research produced the rich, nuanced insights required to explain the causal mechanisms and contextual forces that generic, survey-based research would probably overlook by concentrating on a single, crucial case.

4.5. Research Design

In this present study, a qualitative research design was used to explore and describe lived experiences, perceptions, and meanings associated with the phenomenon being studied. Furthermore, the study employs adaptable exploratory methodologies to provide a comprehensive understanding of intricate social realities, and qualitative research was deemed suitable. This is used to find patterns, themes, and contextual insights that quantitative approaches could miss. The study gave participants' opinions priority and used their narratives. Creswell (2009) posits that a research design is a blueprint that outlines the procedures for collecting and analysing data. These concepts include findings about strategies that would be used to understand the issue under investigation.

Furthermore, a good investigation strategy involves thorough planning, stating the problem or identifying a gap and filling it by motivating your reasons for selecting the problem, obtaining data from previously published works that are comparable to the phenomenon being studied, recognising the significance of the phenomenon for the audience, and determining the necessity of the planned study. Mertler (2024) further added that research design is a planned framework for action that serves to establish a connection between the execution of the research strategy and the research questions. The techniques the researcher will use to carry out the research should be

specified in the research plan. It should also explicitly outline the strategy for collecting and analysing data.

Overall, the qualitative methodology offered a strong foundation for delving into the intricacies of the research question, giving the viewpoints of the participants, the context, and the depth of the study top priority to produce insightful findings.

4.5.1. Sample Population

The sample population of this study was made up of senior management professionals. The analysis unit encompassed top executives, the Chief Information Officer (CIOs), and the Chief Executive Officer (CEO's) of a singular SOE due to having significant decision-making responsibilities; therefore, their opinions represent those of the organisation. At least 10 years of leadership experience was one of the selection criteria, ensuring a thorough understanding of strategic management techniques. The focus of the study on senior management was intended to collect professional points of view on organizational performance, corporate governance, and leadership issues. The findings were applicable to top-tier company strategy and governance due to this focused approach.

A sample population often just referred to as a sample is a carefully chosen subset of people, things, or occurrences drawn for statistical analysis or research purposes from a larger target population. Sampling is used primarily to conclude the entire population without looking at every individual, which is frequently impractical due to logistic, financial, or time limitations. To ensure that the sample fairly represents the larger population and enable reliable and generalisable results, researchers employ a variety of sampling approaches (Saunders et al., 2019).

The senior management was chosen as the sample group due to their knowledge of business strategy, innovation at work, and successful leadership. The focus of the study on this group was intended to produce results that could inform organizational growth plans, executive training programs, and policy recommendations for senior management. Their advice was especially

helpful in determining how leaders handle challenging business situations and promote sustained success.

4.5.2. Unit of analysis

A single state-owned enterprise (SOE), viewed as a comprehensive, intricate organizational structure, serves as the main analytical unit for this study. This means that the main instance under examination is the SOE itself, with its distinctive mix of internal policies, corporate governance structures, strategic leadership, and performance indicators.

4.5.3. Data Analysis

Flick (2015) defines data analysis as a methodical process of examining, converting and analysing data to gain valuable insights, identify patterns, and inform decision-making. To help organizations make data-driven decisions, statistical, mathematical and computational tools are applied to structured and unstructured data. Data analysis may be diagnostic, descriptive, predictive, or prescriptive. As further defined by Creswell & Creswell (2018), data analysis is "the process of making sense out of data," which involves arranging, analysing and meaningfully presenting findings. This study used a detailed qualitative analysis of the interview data to investigate the points of view, experiences, and meanings of the participants on the research question. Following a methodical but adaptable methodology, the analysis made sure that emerging themes from the study's objectives stayed rooted in the participants' own words, while also being in line with the goals of the study. On average, one (1) hour was spent conducting semi-structured interviews with top management. With permission, all interviews were recorded to ensure accuracy. To ensure confidentiality, identifiable information was removed from the transcripts.

The main method of data analysis used in this study was thematic analysis. The methodical flexibility of this qualitative methodology in finding, evaluating, and summarizing patterns (themes) in the rich, textual data collected from in-depth interviews and organizational

documentation led to its selection. The procedure comprised a thorough cycle of getting acquainted with the data, looking for and analyzing possible themes, and then identifying and labeling the central themes that encapsulate the experiences and perspectives of the participants.

Empirical research in all academic fields is based on data analysis, which allows researchers to turn unstructured data into insightful knowledge. According to Creswell and Creswell (2017), data analysis is 'the process of making sense out of the data', which includes arranging, analysing, and combining information to answer research questions. With the proliferation of large datasets and sophisticated analytical tools, the importance of thorough data analysis has increased dramatically in modern research paradigms. Prosdocimi et al. (2009) state that ontology and validity are two basic research ideas that influence how knowledge is created and assessed. Furthermore, ontology is concerned with the nature of reality and preconceptions about what exists, while validity emphasises the precision, credibility, and trustworthiness of the study findings. Their link is especially significant in qualitative and quantitative research, where differing ontological perspectives influence how validity is assessed. Marn and Wolgemuth (2021) define an ontology as a structured framework that explicitly defines and organizes the essential components, relationships, and processes of the data. The ontology provides a systematic means of describing and streamlining analytical workflows across domains by mapping how raw data convert into insights (by steps such as cleaning, modelling, and interpretation). Gregar (2023) further adds that the validity and reliability of the study findings are directly impacted by appropriate data analysis methods. To preserve scientific rigor, the analytical process usually involves several steps, including data preparation, exploratory analysis, statistical modelling, and interpretation. Each step requires careful methodological attention.

4.5.4. Data Collection Techniques

The primary technique used to collect data for this study was the use of open-ended questionnaires. Interview questions served as a guide for the semi-structured interviews at the SOE. Without any word restrictions, participants were urged to provide comprehensive responses. Subsequently, all responses were transcribed, and the questions were neutrally worded to prevent leading answers

and guarantee credibility. The questionnaire, which consisted of only general exploratory questions that allowed participants to share their opinions, experiences, and views in their own words, was carefully crafted to produce rich and thorough responses. The interview included both closed and open questions to ensure that the responses were thorough and clear and was created to collect extensive data relevant to the study's goals. Gregar (2023) describes data collection techniques as a process of compiling information from multiple sources for analysis and conclusion. Thus, the type of data required (qualitative or quantitative), the available resources and the objectives of the study all influence the selection of the technique.

In-depth interviews served as the main technique for collecting data for this qualitative study to obtain comprehensive and substantial insights into the experiences, viewpoints, and actions of the participants. Therefore, the structured framework of the interviews included both preplanned open-ended questions and the freedom to use impromptu follow-up probes to explore more emergent topics. While guaranteeing that important study issues were covered methodically, this strategy allowed in-depth interaction with participants.

With its wide-ranging and exploratory questions, the interview guide was designed thoughtfully to complement research goals in IT governance. Depending on the availability and preference of the participants, each interview was conducted in person and the teams met and lasted approximately 60 minutes. The interviews were recorded with the participants' permission to guarantee accuracy, and notes were taken to document any follow-up questions.

4.5.5. Data collection method used for this study

For this study, the researcher used a qualitative technique to assist in identifying challenges and provide strategies for the phenomenon being studied. In addition, primary data were gathered through structured interviews and supported by secondary data gathered through the analysis of pertinent documents and literature. In a structured interview, every participant is asked the same set of pre-prepared questions, and all questions have been prepared in advance (Daniel, 2018). The study used closed-ended and open-ended interview questions.

According to Saunders et al. (2019), structured interviews involve detailed questions that urge participants to go into more detail. Since the study looks at information technology frameworks, it is best to create the interview schedule using broad topics that are significant and relevant to the research. This promoted the discovery of other significant study factors. A questionnaire was created for this study using the constructs of the research model. Two parts were created, including open-ended and closed-ended questions.

Creswell (2009) confirms that:

- Questions are prepared before the interview for the researcher and participants to fully comprehend the study and questions.
- Since structured interviews can be completed quickly, several interviews can be completed in a short period of time.
- It is possible to obtain a high-quality sample, resulting in conclusions that are both illustrative and comprehensive for a large population.
- Reliability is easy to test because structured interview questions are easy to measure.

4.5.6. Research validity, dependability, and qualitative rigor

A qualitative study's methodological integrity and reliability are referred to as its qualitative rigor. In qualitative research, credibility is established using different frameworks than in quantitative studies, where validity and reliability are tested quantitatively. Along with confirmability/ neutrality and transferability/applicability to various contexts, important criteria are validity/ precision of findings and dependability/consistency (Tazik and Maniati, 2024).

4.5.6.1. Research validity

Gulati et al., (2023) define validity in qualitative research as the degree to which a study faithfully captures the phenomenon it purports to analyze, guaranteeing that the results are reliable,

significant, and representative of the experiences of the participants. In contrast to quantitative research, where validity is frequently evaluated using statistical metrics, qualitative validity emphasizes the reliability, precision, and interpretive rigor of the study. Validity in qualitative research is reconceptualized as trustworthiness, frequently decomposed into essential characteristics like dependability, credibility, transferability, and confirmability, all of which work together to guarantee the precision and rigor of the results.

Through methodological and theoretical triangulation, research validity is thoroughly addressed in this study to ensure that the results are a reliable depiction of the phenomenon under investigation. A thorough, verifiable grasp of IT governance and digital technologies for performance enhancement is provided by the thoughtful application of a qualitative case study design, which enables the gathering of rich, contextual data through in-depth interviews and document analysis. This improves credibility (internal validity).

4.5.6.1.1. Credibility

Credibility, which is comparable to internal validity in quantitative research, guarantees that the results are credible and fairly reflect the opinions of the participants. Credibility is increased by strategies including triangulation (using different data sources, methodologies, or researchers), member checking (confirming interpretations with participants), and sustained involvement (spending enough time in the field) (Miller et al., 2022). This present study used triangulation to ensure credibility, which is similar to internal validity. Specifically, it collected data from multiple sources, conducted in-depth interviews with managers and senior managers to obtain multiple perspectives on the same phenomenon.

4.5.6.1.2. Transferability

(Vu, 2021) defines Transferability, like external validity, as the extent to which results can be used in different situations. Rather than extrapolating findings, qualitative researchers give readers in-depth explanations of the context, participants, and procedures so they can judge how applicable the findings are in different contexts. Although transferability, like external validity, is naturally constrained in a single case study, this study gives readers and future researchers enough information to evaluate the findings' possible applicability to their own contexts by providing thick, detailed descriptions of the organisational context, the roles of the participants, and the IT governance and digital technologies processes examined.

4.5.6.1.3. Confirmability

Reflects objectivity, ensures that the facts, not the researcher's prejudice, shape the conclusions. Reflexivity (researchers admitting their impact) and keeping an audit trail to show how findings were reached are two strategies (Johnson et al., 2020). When qualitative research lacks robust validity, it runs the risk of being written off as subjective or anecdotal. By methodically putting these guidelines into practice, researchers improve the rigor of their work and make sure that their interpretations are sound and significant to audiences in both academia and industry (Singh et al., 2021). Confirmability, which reflects objectivity, was sought by keeping a reflexive journal to guard against researcher biases and by making sure that the results were firmly based on participant data rather than the researcher's assumptions. This showed that respondents, not the researcher, shaped the results.

4.5.6.2. Qualitative rigor

Coleman (2022) asserts that the rigor and clarity with which qualitative researchers identify, examine, and report non-numerical data is known as qualitative precision. To guarantee that findings are precise, consistent, and supported by evidence, it entails the use of well-structured

techniques, concepts that are clearly expressed, and thorough descriptions. The depth of interpretation, logical coherence in coding, and the avoidance of ambiguous or unsupported statements are the main objectives of qualitative precision as opposed to quantitative research, where precision is quantified in numerical terms. Researchers accomplish this through meticulously recording their analytical procedure, substantiating themes with direct quotations or examples, and upholding transparency in the process of drawing results. Qualitative studies gain credibility by emphasizing accuracy, which gives readers confidence in the dependability and validity of the information they provide (Mosbah, 2024).

4.5.6.3. Dependability

The consistency and dependability of the results across time and under various circumstances are referred to as dependability in qualitative research. Qualitative dependability is concerned with making sure that the research process is rational, well-documented, and methodologically sound so that another researcher could follow the same procedures and arrive at similar conclusions (Armour and Williams, 2022). This contrasts with quantitative research, where reliability is frequently assessed through statistical tests. Daniel (2018) further adds that this principle is strongly related to auditability, which is the ability of the study's procedures, data collection, and analysis to be openly and methodically documented so that others can follow the reasoning behind the conclusions.

To provide a transparent and logical research path that could be audited, dependability was built by keeping a thorough audit trail that documented all methodological decisions, from the rationale behind purposive sampling to the development of the interview guide.

Researchers use techniques like audit trails, which carefully record choices made during coding, theme development, and interpretation, to create reliability. Discussing results with other researchers, or peer debriefing, also aids in confirming that interpretations are based on the facts rather than subjective opinion. Furthermore, by guaranteeing consistency in results, stepwise replication in which several researchers examine the same data separately can improve reliability.

Qualitative researchers show that their findings are a reliable representation of the facts rather than being arbitrary by upholding strict methodological standards (Forero et al,. 2018)

1. Dependability key characteristics

- **Auditability**: A trustworthy study offers a transparent audit trail that records all methodological choices, data gathering procedures, and analytical stages. This makes it possible for other researchers to use the same methods and evaluate whether the results make sense.
- **Data Stability**: Dependability guarantees that interpretations are consistent with the data gathered at every stage, even when qualitative data may change over time (for example, in longitudinal research).
- **Researcher Consistency**: When several researchers are working together, methods such as intercoder reliability tests (in the context of thematic analysis) can assist in keeping coding and theme development consistent.

By ensuring that the study's conclusions are solid and well-supported, even in the absence of numerical replication, dependability raises the credibility of qualitative research. This is especially significant in disciplines such as psychology, education, and the social sciences, where contextual elements and subjective experiences greatly influence the results of the study (Noble and Smith, 2025)

4.5.7. Research Ethics

This present study used a case study as its research strategy, which gave a realistic portrayal. Therefore, maintaining secrecy regarding the study's participants and the data they submitted was crucial. Below is an explanation of the research ethics followed in this study:

4.5.7.1. Informed consent

Ethical issues included informed consent, privacy protection, and making sure that participants would not suffer any bodily, psychological, or social harm as a result of the study. ensuring that every participant's rights, dignity, and protection were maintained during the study. informed consent, which requires that participants are fully and comprehensibly advised about the study's purpose, procedures, potential risks, and benefits, and voluntarily agree to partake without any form of coercion. Alongside this is the crucial responsibility of privacy protection, which entails protecting participants' identities and the information they submit using safeguards such confidentiality agreements, secure data storage, and anonymization to avoid unwanted access or disclosure. Furthermore, researchers must follow institutional or disciplinary ethical rules, declare any potential conflicts of interest, and keep their techniques transparent. Without these ethical guidelines, even the strongest evidence can be questioned, compromising the validity of the entire study (Suri, 2020).

4.5.7.2. Right to Privacy and Confidentiality

he confidentiality of the study has been upheld; participants were kept anonymous during the whole investigation, and no personal information was revealed during any of the observations or interviews.

To respect the rights and dignity of each participant, ethical issues were a central priority in this study. The present study complied with accepted ethical standards, including those established by the institution's ethics committee. A detailed consent letter explaining the study goal, methods, advantages, and participantion rights was given to each person before their participation. The letter made it clear that participation was voluntary and that individuals could withdraw at any time.

All information collected was anonymised to preserve participant privacy. Access to the collected data was limited to the present study only. An ethics committee conducted a formal ethical review

of the project prior to data collection. The results were stated truthfully and properly, without excluding any contradictory or unfavorable findings.

4.5.7.3. Protection from Harm

To avoid any unanticipated harm, participants were questioned about any circumstances that the researcher might not have known about but that could increase the risk of harm, such as pre-existing psychological problems.

4.5.8. Justification for the choice of the research methodology

The rationale behind the careful selection of each research method for this study was its distinct fit with the research goal and objectives, which were to comprehend the dynamics of decision-making within the SOE management and leadership. The rich, complex experiences and strategic justifications of managers and senior managers were not sufficiently drawn by a fixed-response survey, so a qualitative, semi-structured interviewing method was selected over quantitative surveys. Rather than utilizing random sampling, which would have probably included non-decision-making staff and diluted the findings, purposeful sampling was used to explicitly target these important decision-makers, guaranteeing data relevance.

Additionally, since the research purpose was to explore and describe the status of decision-making rather than its history across time, a cross-sectional approach was used rather than a longitudinal one to provide a timely snapshot of current organizational tactics and challenges. The validity and relevance of the results to the study problem are maximized by this well-coordinated methodological design, which ensures that each step directly contributes to producing comprehensive, context-specific insights from the most knowledgeable sources.

4.5.9. Sampling method

Purposive sampling was used in the present study to particularly target those with the official titles of "manager" or "senior manager" to consciously find and recruit those who were essential to the organization's strategic decision-making. Potential participants were selected based on their decision making in the organisation consisting of 50% managers and 50% senior managers. To ensure consistency in data collection and flexibility for high-level participants, semi-structured one-on-one interviews were conducted virtually over a focused two-month period using a secure video-conferencing platform. Each interview, lasting roughly 45 to 60 minutes, was audio-recorded and verbatim transcribed for thematic analysis.

4.6. Chapter Summary

To explore and describe how IT governance and digital technologies intersect in State-Owned Entities (SOEs), the study was conducted as an interpretive qualitative study, with in-depth interviews serving as the data collection technique. The methodology supports the study purpose of comprehending intricate social processes through participants' subjective interpretations and lived experiences. In contrast to quantitative methods that aim for quantifiable generalizations, this methodology enables a detailed analysis of how organizational actors view, apply, and modify governance frameworks in the context of digital transformation. Since the present study specifically examine the difficulties, tactics, and socio-technical factors influencing IT governance, use of digital technologies, and performance improvement in SOEs, an interpretive philosophy is especially appropriate since it captures context-rich insights that positivistic surveys or experiments could miss.

The data analysis procedure was also described in the chapter, emphasizing the method used. This chapter laid the groundwork for the presentation and discussion of findings in subsequent chapters by establishing the study's credibility and dependability.

CHAPTER 5: DATA ANALYSIS AND DISCUSSION OF FINDINGS

5.1. Introduction

The previous chapter described the research methodology followed in conducting the present study. This chapter analysis data and discusses study findings. And this is done per study objectives; that is, per themes and subthemes. The findings from the analysis of data are discussed below. The outcome of the interviews are presented and discussed in order of precedence. Using a semi-structured interviewing technique worked well for gathering both extensive narratives on IT governance and the use of digital technologies.

To ensure clarity and a logical flow, the interview guide was thoughtfully divided into the following subject sections: IT Governance Practices, Digital Technology Integration, Performance Enhancement, Barriers and Enablers, and Future Outlook. Participants having first-hand knowledge of digital initiatives and IT governance were chosen using purposive sampling. Semi-structured interviews were conducted electronically (via MS Teams), and to maintain data integrity, every recording was meticulously transcribed.

5.2. Data Analysis Ontology

The present study was grounded on an ontological framework with five basic elements, namely Concepts, Relationships, Functions, Axioms, and Instances to methodically structure the exploration and description of IT Governance and digital technologies in State-Owned Entities (SOEs). This framework established a solid foundation for understanding the underlying nature of governance and digital convergence, enabling clarity and coherence in describing essential concepts and their relationships.

5.3. Interview Analysis

The collected data were analyzed using a flexible approach, drawing on insights from the recorded MS Teams interviews, and employing the ontological framework to ensure a structured yet flexible study of participants' opinions, experience and views. Given the qualitative nature of the study, the primary aim was to gain in-depth insights from participants. To ensure accuracy, all interviews were transcribed word by word. The ontological framework approach facilitated this by organizing data into themes and subthemes.

Interviews also provided a comprehensive perspective on departmental collaboration and the integration of governance. Themes emanating from the present study were: information technology guidelines and practices, the impact emerging technologies on SOEs', demand for modern IT procedures, strategy alignment and lastly, the role of stakeholders in creating and fostering a culture of innovation while leveraging information technology capabilities.

The data analysis and discussion of findings are articulated following a theme and subthemes, which is followed by excerpt from the data. This is then followed by a brief discussion of the finding.

5.4. Theme 1: Information technology guidelines and practices

Theme one focuses on comprehending key information technology (IT) guidelines and practices by examining established frameworks and standards as they manifest at the SOE to ensure that IT operations are efficient, secure, and compliant. This includes analyzing regulations such as ITIL for service management, ISO/IEC 27001 for information security, and COBIT to assist organisations in controlling and managing their IT activities successfully.

5.4.1. Sub-theme: Proper procedures support

Table 5.4.1: Responses with reference to data

Ontology element	Description
Concepts	Policy, procedures, Functionality, Risk, Compliance
Relationships	Stakeholder Influence on IT Governance Priorities
Functions	Regulations, IT strategy/Frameworks, Policies
Axioms	National Digital Policies
Instances	Executive

"It is quite critical as IT policies and procedures have become the bedrock of processing and efficiencies. There must be a structured approach to ensure that people use the deployed technologies appropriately within companies. They help ensure that technology use does not expose the company to unnecessary risks. Policies balance functionality and productivity with cost-effectiveness, highlighting the need to achieve economies of scale. Proper procedures support effective service management and service delivery".

The extract suggests that formal procedures and governance structures are not only administrative tasks but essential strategies that profoundly influence the connection between technology investment and organisational performance. Viewed through this perspective, well defined decision-making frameworks fulfill a dual role: they function as a disciplinary tool that mitigates financial waste and operational risk, while also serving as a supportive structure that directs technological potential towards quantifiable competitive advantage. This indicates that accountability and compliance are not external obligations but inherent outcomes of procedural clarity when rules are clear, they eliminate ambiguity, enhance workflows, and strengthen data integrity, thus converting governance from a reactive measure into a proactive catalyst for sustainable growth. The theory asserts that organized procedures transition from mere operational requirements to strategic assets, suggesting that an organization's enduring resilience depends more on the strictness of the regulations governing technology use than on the technology itself.

5.4.2. Subtheme: Opportunities and problems

Table 5.4.2: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions, and strategy alignment
Relationships	Employees in the organization
Functions	Compliance, processes, and agility
Axioms	Organisational functions
Instances	Senior management

"*The need for alignment with the mandate of the SOE, using the CSIR as an example, the mission to advance South Africans' lives through science, technology, and innovation. Internally, multiple clusters work towards this mandate, and the ICT function must enable all clusters with suitable business applications. Practical examples included support functions like the finance team and tools such as timesheet applications and customer relationship management (CRM) systems. Robust policies enable the business to achieve its mandate but can sometimes reduce agility due to the rigorous compliance they require*".

The focus on explicitly articulated objectives demonstrates a fundamental governance principle: that strategic coherence serves not merely as a motivating instrument but primarily as a cognitive and operational guide that harmonizes disparate efforts towards a singular goal. When objectives are firmly linked to an organization's fundamental mandate, they not only define direction but also regulate resource allocation, prevent mission drift, and convert abstract vision into quantifiable benchmarks for accountability. This alignment is not just hierarchical but also systemic; by harmonizing individual, departmental, and organizational objectives, the organization effectively mitigates the friction of conflicting priorities, ensuring that every action aligns with the overarching goal. Ultimately, this clarity not only improves internal efficiency but also conveys outward credibility, indicating to stakeholders that the organization functions with purpose and dependability, thus strengthening its legitimacy and long-term viability.

5.4.3. Subtheme: Impact of emerging Technologies on IT policies

Table 5.4.3: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions, emerging technologies
Relationships	Employees in the organization
Functions	Processes
Axioms	Decision making
Instances	Senior management/ Executive

"*AI is a significant emerging technology and 'everything and nothing' if not applied purposefully. And over-reliance on AI that diminishes human intellectual capacity, AI must complement, not replace, thinking. Other emerging technologies, such as cloud computing, are noting increased expectations for speed and cost-effectiveness within organisations. Employees often compare internal IT services to their external personal experiences, expecting the same level of convenience and pricing. Storage costs, as an example: consumers can buy large-capacity external hard drives affordably, but enterprise solutions like SharePoint storage are significantly more expensive. These external market realities influence internal IT expectations and policies*".

The participant's statement characterises future technologies, particularly artificial intelligence, not as simple enhancements but as transformative agents that fundamentally disrupt existing IT regulatory frameworks. Through the implementation of automation, predictive analytics, and dynamic security protocols, AI not only improves existing systems but also fundamentally alters the operational logic of traditional frameworks, necessitating that policymakers address new conflicts between innovation and ethical limitations. This indicates a pivotal transformation: governance must transition from static, rule-based frameworks to an adaptive, proactive approach that predicts privacy violations, algorithmic bias, and accountability deficiencies before they materialise. The participant emphasizes that AI's genuine regulatory influence is not primarily derived from its technical abilities, but rather from its potential to reveal the inadequacy of

inflexible oversight systems, necessitating a reevaluation of the implementation of trust, control, and compliance in a digitally mediated context.

5.4.4. Subtheme: Stakeholder engagement in developing IT guidelines

Table 5.4.4: Responses with reference to data

Ontology element	**Description**
Concepts	IT guidelines
Relationships	Stakeholders and the organisation
Functions	Effective processes
Axioms	Stakeholder engagement
Instances	Senior management/ Executive

"Stakeholder consultation is essential for the adoption of governance documents and materials. While ICT may drive initiatives, governance tools like policies are for the benefit of the entire organisation, not ICT alone. Engagement ensures a higher level of adoption and smooth integration of requirements into practice. It provides visibility on how the business will use the technology, ensuring that IT solutions are fit for purpose".

Analysed from a governance perspective, the focus on stakeholder involvement uncovers a crucial understanding: effective IT regulations are not merely technical artifacts but socially created accords that obtain their legitimacy from the actors they regulate. By intentionally integrating IT teams, leadership, end-users, and compliance experts, organizations do not simply collect opinion; they engage in a nuanced act of co-optation, converting prospective dissenters into active co-architects of policy. This participatory logic fulfills two strategic objectives: it reveals operational conflicts and ethical dilemmas early in the design process, while concurrently instilling a feeling of procedural justice that fosters voluntary compliance instead of coercive enforcement. The argument posits that authentic inclusion prioritizes pragmatic risk management over democratic idealism, as stakeholders' involvement in governance frameworks enhances transparency,

diminishes resistance, and inspire resultant policies with an authority unattainable through top-down mandates alone.

5.4.5. Subtheme: Incorporating Cybersecurity into IT Guidelines

Table 5.4.5: Responses with reference to data

Ontology element	Description
Concepts	IT guidelines, cybersecurity
Relationships	Organisation
Functions	Effective processes
Axioms	High level decision makers
Instances	Senior management/ Executive

"Cybersecurity measures are a standard requirement within their policies and technology framework. The threat landscape is always evolving, so countermeasures are non-negotiable. Policies must describe these controls at a high level, with associated standards addressing: Email security, Web security, Endpoint (antivirus) security, and Network security".

The participants emphasis on integrating cybersecurity into IT guidelines indicates a paradigm shift from reactive measures to fundamental governance, positioning security as an integral component of IT policies, risk frameworks, and everyday operations. This viewpoint reconceptualizes cybersecurity as an inherent organisational practice instead of merely a technical protection, suggesting that threats like ransomware and data breaches are not isolated incidents but systemic weaknesses that necessitate proactive, integrated countermeasures such as routine evaluations, employee training, and well-practiced incident response protocols. Furthermore, by aligning these initiatives with global benchmarks and optimal industry practices, organisations execute a dual strategy: they externally convey trustworthiness and dependability to stakeholders, while simultaneously constructing a robust framework capable of withstanding and adjusting to a changing threat environment. Ultimately, the assertion posits that emphasizing cybersecurity

within IT governance transcends merely preventing dire outcomes, it is about embedding a culture of vigilance, wherein trust, continuity, and regulatory adherence emerge as inherent results of a security-centric approach rather than expensive considerations.

Theme 2: The impact of emerging technologies on SOEs' demand for modern IT procedures and Strategy alignment

5.4.6. Subtheme: Alignment of IT Strategy with SOE Goals

Table 5.4.6: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"For our organisation, the alignment is strong. We launched a strategy development process called Project Synapse, resulting in an ICT strategy aligned to the broader organisational strategy. This strategy has been implemented over the last 2.5 years and is due for review to ensure it reflects environmental changes".

The participants response emphasizes that synchronizing IT strategy with an SOE's primary goal is not just a recommended practice but an essential requirement for ensuring that technological investments yield concrete organisational benefits, whether assessed in terms of service provision, operational effectiveness, or public responsibility. This alignment serves as a remedial strategy against isolated, self-interested IT projects, urging decision-makers to assess each technological initiative in light of the SOE's fundamental mission and mandate. Integrating IT planning into the

overarching strategic framework allows organisations to not only enhance resource utilization but also to create a coherent narrative that connects digital investments to tangible results, thus reinforcing stakeholder trust and justifying public expenditures. Ultimately, the assertion posits that strategic coherence hinges less on technical alignment and more on the governance rigor that compels an ongoing, critical examination of whether technology benefits the organisation or simply sustains its strategic objectives.

5.4.7. Subtheme: Successful accomplishment of proper alignment of IT Strategy with SOE Goals.

Table 5.4.7: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"*It is critical for an SOE's strategy to connect with its IT strategy. We launched a strategy development process called Project Synapse, resulting in an ICT strategy aligned to the broader organisational strategy*".

The above response emphasize that close coordination between executive management and IT leadership is essential to achieving strategic alignment, giving priority to projects that improve sustainability, governance, and citizen-centric services. To accomplish the SOE's goal and adjust to changing public sector demands, this synergy makes sure that technology serves as an enabler rather than merely an operational instrument.

5.4.8. Subtheme: Incorporating Stakeholder Input in the IT Strategy

Table 5.4.8: Responses with reference to data

Ontology element	Description
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs
Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"*Stakeholder engagement was built into the strategy development process through extensive consultations across divisions and clusters. This ensured alignment with the business areas' needs and priorities*".

The importance of stakeholder input in developing a strong and inclusive IT strategy is emphasized by the participant. Further, underlines that involving a wide variety of stakeholders, such as end users, IT teams, leadership, and outside partners, guarantees that the plan considers operational difficulties, strategic priorities, and real-world demands. Organizations may increase buy-in, decrease resistance to change, and cultivate a feeling of ownership by implementing feedback via workshops, consultations, and iterative reviews.

5.4.9. Subtheme: SOE's current IT strategy supports its strategic priorities

Table 5.4.9: Responses with reference to data

Ontology element	Description
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs
Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"Strategy development was to have engagement with all of the business areas. So, from a divisional point of view. Our structure is a divisional manager. Then we have an executive, and then we have various clusters under a divisional manager, and each cluster then has what we call an executive cluster manager that's responsible for IT strategic alignment."

IT strategy is strongly aligned with overarching strategic goals. The finding emphasizes that the IT initiatives enable digital transformation, increase operational efficiency, and improve data-driven decision-making, all of which are essential for accomplishing long-term organizational goals. By streamlining processes, cutting down on duplications, and enhancing resource use, these programs increase operational efficiency.

5.4.10. Subtheme: Link between Organisational Goals and Employee KPIs

Table 5.4.10: Responses with reference to data

Ontology element	**Description**
Concepts	Organisational goals, Key performance indicators (KPIs)
Relationships	Link employees KPIs with organisational goals
Functions	Employees' KPI, performance scorecard
Axioms	Reporting and accountability
Instances	Executive

"Yes, organisational goals cascade down to individual performance targets, even if not on a 1 on 1 basis. This ensures alignment from the top level down to operational staff".

The finding underlines how crucial it is to connect staff KPIs with organizational goals to ensure responsibility, alignment, and performance. A clear link between individual KPIs and overarching business goals guarantees that staff members comprehend their part in accomplishing strategic

goals, which in turn promotes motivation and a sense of purpose. observed that workers prioritize tasks that directly contribute to the success of the organisation, this alignment increases productivity. Clear KPIs that are linked to organizational objectives enhance performance reviews' transparency and provide more useful improvements. In the absence of this connection, workers would operate in silos, which could result in ineffective and misplaced efforts. For coherent and quantifiable success, a close relationship between corporate goals and KPIs is essential.

5.4.11. Subtheme: Departmental communication

Table 5.4.11: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy coordination
Relationships	Departmental communication
Functions	Staff processes
Axioms	IT strategy coordination
Instances	Senior management and the IT team

"We emphasize the importance of effective departmental communication, which ensures that all teams understand priorities, breaks down silos, and promotes collaboration, it is crucial to coordinate the IT strategy with the SOE's overall objectives. Effective communication reduces effort duplication, speeds up decision-making, and supports business needs in IT initiatives".

Regular cross-departmental meetings integrated digital platforms for real-time information, and transparency led by leadership to ensure consistent messaging are all ways to improve communication. Coordination can be improved by establishing a culture of open communication and organized reporting procedures, which guarantee that IT expenditures directly support the strategic goals of the SOE.

Theme 3: Role of stakeholders in creating IT guidelines and fostering a culture of innovation by leveraging information technology capabilities

5.4.12. Subtheme: Regular IT Strategy Evaluations

Table 5.4.12: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy
Relationships	IT section/ CIO and IT managers
Functions	IT team
Axioms	IT strategy evaluations
Instances	Executive and IT team

"*Regular reviews keep the strategy relevant and practical in a changing environment. At this organisation, we reflect annually during performance planning and management. We use the PESTEL model to consider political, economic, legal, and other external factors. Any needed changes are submitted for executive approval".*

To ensure consistency with changing business goals, technical improvements, and security requirements, the participant underlined the significance of routine IT strategy evaluations and emphasized that by identifying out-of-date systems, maximizing IT investments, and utilizing emerging technology, regular audits help firms remain competitive. By keeping IT infrastructure strong and current, periodic evaluations reduce risks such as operational disruptions and cybersecurity concerns. Frequent assessments promote flexibility, which enables companies to better respond to consumer needs and market shifts. IT strategies may diverge from corporate objectives, resulting in inefficiencies and resource waste. In general, continuous assessments of IT strategies are essential to preserving effectiveness, security, and creativity in a digital environment that is evolving quickly.

5.4.13. Subtheme: Fostering a Culture of Innovation

Table 5.4.13: Responses with reference to data

Ontology element	Description
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Innovative new ideas
Instances	Senior management

"*By nature, technology drives innovation; its application to real business needs is key. Using SharePoint to enable real-time collaborative document editing, replacing outdated shared files. IT Governance Committee meetings invite divisional operations managers to discuss challenges and solutions, promoting innovative ideas".*

The finding transforms an innovative culture from a mere desirable quality to an essential foundation for enduring sustainability and growth, indicating that innovation does not arise spontaneously but requires systematic nurturing through intentional leadership actions and institutional support. When managers proactively acknowledge creativity, promote thoughtful experimentation, and accept the unavoidable setbacks that come with risk-taking, they fulfill an essential signaling role: they convey to employees that innovative concepts are not just accepted but eagerly pursued, thus dismantling the psychological obstacles of fear and complacency that frequently hinder initiative in structured environments. This leadership stance converts innovation from a theoretical concept into a practical implementation, integrating it into everyday tasks and decision-making, while fostering a feedback mechanism where successful trials affirm the strategy and failures serve as educational experiences instead of punitive measures. The assertion suggests that a progressive culture hinges not on occasional innovations but on embedding a mindset of perpetual adaptation, where the organization's ability to transform is intertwined with its leadership's readiness to empower, trust, and allocate resources to the inherent creativity of its employees.

5.4.14. Subtheme: Leadership's role in encouraging Innovation

Table 5.4.14: Responses with reference to data

Ontology element	Description
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Culture of innovation
Instances	Senior management

"Executive support is critical for credibility and buy-in. Frequent communication and progress updates are shared with leadership. Training is essential to reduce resistance to new technologies; however, CSIR acknowledges it needs to improve here. We use a weekly "Did You Know?" bulletin to share tech tips and provide info during staff induction to raise awareness. During the induction programme, staff are briefed on IT capabilities. There are plans to create "Training" where IT staff will engage directly with the CSIR community, gathering specific training needs and addressing them practically".

Encouraging an innovative culture is essential to the flexibility and expansion of the organisation. The importance of leadership is dedication to foster an atmosphere that values innovation, takes calculated risks, and views setbacks as teaching moments. The value of open communication and teamwork it allows cross-functional teams to freely experiment and exchange a variety of ideas.

5.4.15. Subtheme: Supporting Staff in Proposing Creative IT Ideas

Table 5.4.15: Responses with reference to data

Ontology element	Description
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Creative IT ideas/culture of innovation
Instances	Senior management

"Our organisation has a vibrant user community, with staff proactively suggesting improvements. IT is expected to lead these conversations as business units focus on their core work. New ideas are discussed in the New Request Fulfilment Forum, where staff can bring proposals for review and support. A Portfolio Management Team oversees IT project management and balances resources. A Business Relationship Management function continuously engages with business areas to understand needs, feeding this back to ICT".

The finding shows the significance of actively encouraging employees to suggest innovative IT concepts to spur innovation and digital transformation is important. Giving employees training or mentorship can enable them to polish and confidently present their ideas. The view is that to unleash the creative potential of their IT teams, organisations need to establish a safe, encouraging, and action-oriented atmosphere.

5.4.16. Subtheme: Supporting Staff in Proposing Creative IT Ideas

Table 5.4.16: Responses with reference to data

Ontology element	**Description**
Concepts	IT projects
Relationships	Organisational staff and Senior management
Functions	Organisational programs
Axioms	IT projects impact
Instances	Senior management and Executive

"*The Portfolio Management Team tracks and oversees all IT projects. Progress and feedback are reported through, IT Governance Committee, the IT Management Team, and the Capital Investment Governance Committee for high-value projects, for example, the R90+ million network upgrade. These channels ensure accountability and alignment with company goals".*

The finding shows that the impact of new IT projects on service delivery and performance is thoroughly assessed using defined processes that gauge scalability, efficiency gains, and alignment with corporate goals. Agile retrospectives and IT governance committees are used to evaluate progress and make incremental modifications. Adaptive feedback mechanisms and ongoing evaluation guarantee that IT projects improve service quality while preserving operational excellence. Examples of IT improving Performance include electronic signing, which became critical during COVID-19 and continues to streamline processes. Process automation is replacing manual forms with digital workflows for better efficiency and oversight. Using SharePoint to enhance collaboration through real-time document sharing and editing.

5.4.17. Subtheme: Incorporating IT into business operations

Table 5.4.17: Responses with reference to data

Ontology element	**Description**
Concepts	Incorporating IT
Relationships	IT team
Functions	Organisational processes
Axioms	Business operations
Instances	IT team

"*There are several ways that IT integration can improve corporate performance, including increasing organisational efficiency through automating operations to increase productivity."*

The finding shows that tools for real-time collaboration are thought to be essential for enhancing agility and teamwork in the organisation to gain a competitive edge, increase productivity, and innovate by strategically integrating IT into operations. SOE's may greatly increase productivity, lower human error, and speed up workflows by automating repetitive and routine tasks. This increases overall quickness, optimizes resource allocation, reduces operating expenses, and frees up staff to concentrate on higher-value tasks. Additionally, real-time data processing, improved decision-making, and easier departmental coordination are all made possible by IT-driven

automation. Businesses can thus get a competitive edge in a market that is becoming increasingly digital, as well as increased operational excellence and scalability.

5.4.18. Subtheme: Improvements to IT Governance Procedures

Table 5.4.18: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance procedures
Relationships	Senior management
Functions	Organisational processes and procedures
Axioms	IT governance improvements
Instances	Senior management and Executive

"*Everything can be improved; while our organisational has a highly regulated environment with a proud clean audit status, the rigorous governance processes sometimes slow down operations. Suggested reviewing processes to balance efficiency and compliance".*

The finding stresses the importance of efficient processes to streamline decision-making, risk management, and compliance. Clearer role definitions within IT governance bodies to reduce overlaps and improve accountability.

5.4.19. Subtheme: Tools to enhance Digital Integration and IT Governance

Table 5.4.19: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance and digital integration
Relationships	Senior management
Functions	Organisational tools
Axioms	IT functions and processes
Instances	Senior management and Executive

"A CRM product integrated with contracting and financial systems to track contracts, services, invoices, and spending. A platform to help staff understand how to integrate AI into existing functions, as AI offers great potential".

The finding shows that to improve digital integration and strengthen IT governance within the company; cutting-edge tools such as CRM products and technologies are crucial. Participants emphasized automated compliance technologies for IT governance, which allow for real-time policy enforcement and risk monitoring. By using these tools, digital and governance processes can be made more transparent and efficient.

5.4.20. Subtheme: Observations on Digital Technology and IT Governance in SOEs

Table 5.4.20: Responses with reference to data

Ontology element	**Description**
Concepts	Digital technology, IT governance
Relationships	Senior management
Functions	IT systems
Axioms	IT functions and processes
Instances	Senior management and Executive

"*I envision a future where government entities collaborate more efficiently, bulk licensing for Microsoft licenses instead of buying independently. Centralised identity management (leveraging Home Affairs databases) could streamline employee onboarding. More integrated, end-to-end processes across government could improve security and efficiency. Tackle risks like phishing campaigns with more unified approaches".*

The finding highlights the necessity for SOEs to collaborate in exchanging insights and best practices on digital technologies and IT governance to boost efficiency and innovation. Collaborative digital transformation amongst SOEs can improve national economic resilience, cut down on redundancies, and improve service delivery.

5.4.2 Theme 1: Analyse information technology guidelines and practices

5.7.2.1. Sub-theme: Proper procedures support

Table 5.4.2.1: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, procedures, Functionality, Risk, Compliance
Relationships	Stakeholder Influence on IT Governance Priorities
Functions	Regulations, IT strategy/Frameworks, Policies
Axioms	National Digital Policies
Instances	Executive

"Critically important given the complex legislative environment (PFMA, King principles, POPIA). A robust framework is necessary to ensure compliance and proper risk management".

The finding underlines how crucial it is to examine information technology (IT) policies and procedures, especially considering the intricate legal framework that governs the South African government and SOE's. To ensure accountability, data security, and ethical management, strict IT governance is necessary for compliance with frameworks like the Protection of Personal Information Act (POPIA), the Public Finance Management Act (PFMA), and the King's principles on corporate governance.

5.4.2.2. Subtheme: Opportunities and problems

Table 5.4.2.2: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions, and strategy alignment
Relationships	Employees in the organisation
Functions	Compliance, processes, and agility

Axioms	Organisational functions
Instances	Senior management

"Gaps in digital transformation and automation within government entities compared to the private sector. Cybersecurity remains a big risk area due to limited funding and resources".

The finding draws attention to the substantial gaps in automation and digital transformation within government organizations, pointing out inefficiencies brought on by antiquated systems, disjointed procedures, and a dearth of integrated digital solutions. The main obstacles are the sluggish adoption of cutting-edge technologies, insufficient finance, and poor skill development.

5.4.2.3. Subtheme: Impact of emerging Technologies on IT policies

Table 5.4.2.3: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions, emerging technologies
Relationships	Employees in the organisation
Functions	Processes
Axioms	Decision making
Instances	Senior management/ Executive

"Emerging technologies will increase the need for modern aligned IT practices to address automation and cybersecurity challenges".

The finding shows that industries are changing at an unprecedented pace thanks to emerging technologies like blockchain, artificial intelligence, and the Internet of Things (IoT). However, the complexity, security threats, and scalability issues brought forth by their quick adoption also necessitate the use of contemporary, coordinated IT procedures. Agile approaches, strong cybersecurity frameworks must be given top priority by organizations to ensure smooth integration and operational effectiveness.

5.4.2.4. Subtheme: Stakeholder engagement in developing IT guidelines

Table 5.4.2.4: Responses with reference to data

Ontology element	**Description**
Concepts	IT guidelines
Relationships	Stakeholders and the organisation
Functions	Effective processes
Axioms	Stakeholder engagement
Instances	Senior management/ Executive

"Users need to be involved to ensure buy-in and usability. Many staff are highly knowledgeable, so early engagement is key to avoid resistance".

The finding shows that to create effective IT guidelines, stakeholder participation is essential since end users offer insightful information about the demands, difficulties, and expectations of the actual world. Including stakeholders such as staff members, clients, and IT departments guarantees that policies are useful, easy to use, and consistent with corporate goals.

5.4.2.5. Subtheme: Incorporating Cybersecurity into IT Guidelines

Table 5.4.2.5: Responses with reference to data

Ontology element	**Description**
Concepts	IT guidelines, cybersecurity
Relationships	Organisation
Functions	Effective processes
Axioms	High-level decision makers
Instances	Senior management/ Executive

"Cybersecurity should be embedded throughout policies, incident response, and continuity planning. It must form the backbone of IT governance".

The finding shows that to provide strong security against changing threats, cybersecurity must be completely incorporated into all organizational policies, incident response procedures, and business continuity plans. Cybersecurity ought to be viewed as a fundamental component of IT governance, impacting decision-making at all levels, rather than as an afterthought. Organizations may proactively reduce risks by integrating security into their policies, and they can respond quickly and effectively to risks by having clear incident response plans. Integrating cybersecurity into continuity planning, activities are protected during interruptions, reducing downtime and monetary losses. A proactive, comprehensive approach to cybersecurity is essential for contemporary IT governance since it increases resilience, fosters stakeholder confidence, and complies with legal requirements

Theme 2: The impact emerging technologies have on SOEs' demand for modern IT procedures and Strategy alignment

5.4.2.6. Subtheme: Alignment of IT Strategy with SOE Goals

Table 5.4.2.6: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"ICT must be linked to the overall strategy. An ICT governance framework helps ensure alignment, supported by budget/resource planning and continuous monitoring".

Finding highlights that to promote efficiency and creativity, ICT needs to be tightly matched with the organization's overarching strategy. Instead of functioning independently, technology ought to

assist in facilitating fundamental business goals, such as data-driven decision-making, process automation, or digital transformation. Organizations may guarantee resource optimization and smooth operations by combining ICT with strategic goals.

5.4.2.7. Subtheme: Why is this alignment critical?

Table 5.4.2.7: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"Without alignment, value is lost, processes become slower, and manual inefficiencies remain. ICT underpins key performance indicators (KPIs)".

Finding shows that without a suitable alignment between ICT and business objectives, organisations run the danger of considerable value destruction, slow processes, and ongoing manual inefficiencies, as all participants emphasized. It emphasizes how misaligned or compartmentalized IT systems impede data-driven decision-making, diminish efficiency, and produce bottlenecks. ICT is important in enabling key performance indicators (KPIs), such as revenue growth, service delivery, and operational efficiency, rather than merely serving as a support role.

5.4.2.8. Subtheme: Incorporating Stakeholder Input in the IT Strategy

Table 5.4.2.8: Responses with reference to data

Ontology element	**Description**

Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs
Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"Stakeholders are consulted through regular business planning cycles. Direct sessions identify shortcomings and set KPIs to address gaps, with ongoing measurement and feedback".

The finding shows that to ensure alignment with changing needs, stakeholder engagement should be constant and systematic, incorporated into regular business planning cycles. The value is derived from in-person consultations where executives, end users, and IT teams work together to pinpoint gaps, hone goals, and set quantifiable KPIs. Stakeholder consultation plays a significant role in steering the organization in the right direction in terms of addressing the organisational goals.

5.4.2.9. Subtheme: SOE's current IT strategy supports its strategic priorities

Table 5.4.2.9: Responses with reference to data

Ontology element	**Description**
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs
Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"ICT function's journey focuses on seamless integration and effective back-office support. Performance is tracked quarterly, with annual evaluations, cascading down to individual KPIs".

The finding shows that IT strategy is strongly aligned with its overarching strategic goals, according to the participants' comments. emphasized that the IT initiatives enable digital transformation, increase operational efficiency, and improve data-driven decision-making, all of which are essential for accomplishing long-term organizational goals.

5.4.2.10. Subtheme: Link between Organisational Goals and Employee KPIs

Table 5.4.2.10: Responses with reference to data

Ontology element	**Description**
Concepts	Organisational goals, Key performance indicators (KPIs)
Relationships	Link employees KPIs with organisational goals
Functions	Employees' KPI, performance scorecard
Axioms	Reporting and accountability
Instances	Executive

"Organisational goals are strategically filtered down to individual performance goals. This approach ensures strategic alignment and coherence at all organizational levels".

The finding shows that alignment at all organisational levels demonstrates how organisational goals cascade into individual performance targets. The procedure guarantees that the goals established for operational personnel are informed and shaped by more general strategic objectives. Cohesion is promoted by this alignment, which guarantees that each person's contributions complement the organisation's overall goals and objectives. The organisation can stay focused, encourage accountability, and improve overall effectiveness in accomplishing its goals by tying high-level goals to daily performance measurements.

5.4.2.11. Subtheme: Departmental communication

Table 5.4.2.11: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy coordination
Relationships	Departmental communication
Functions	Staff processes
Axioms	IT strategy coordination
Instances	Senior management and the IT team

"Departmental communication ensures buy-in. The need for frequent, clear communication through emails, meetings, and formal evaluations to keep everyone aligned with goals".

The finding shows that departmental communication is crucial as it promotes alignment with company objectives and buy-in. Through a variety of platforms, including meetings, emails, and official assessments, leadership makes sure that staff members are informed, involved, and constantly in line with strategic goals. Regular and transparent communication improves accountability and teamwork by reiterating priorities, setting clear expectations, and offering avenues for feedback.

Theme 3: Role of stakeholders in creating IT guidelines and fostering a culture of innovation by leveraging information technology capabilities.

5.4.2.12. Sub-theme: Regular IT Strategy Evaluations

Table 5.4.2.12: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy
Relationships	IT section/ CIO and IT managers
Functions	IT team
Axioms	IT strategy evaluations

Instances	Executive and IT team

"Evaluations are done quarterly, with a formal annual review to confirm alignment with the strategy. KPIs are then adjusted for the next financial cycle".

Finding shows that there is a systematic approach to performance management that includes quarterly assessments and a formal annual review to guarantee continued alignment with corporate objectives. Frequent evaluations enable prompt modifications, guaranteeing that team and individual efforts stay concentrated on strategic aims. After that, Key Performance Indicators (KPIs) are adjusted for the subsequent fiscal cycle, allowing the company to adjust to evolving objectives or operational requirements. By continuing this cycle of review, the business encourages accountability, adaptability, and continual development in the pursuit of its long-term goals.

5.4.2.13. Subtheme: Fostering a Culture of Innovation

Table 5.4.2.13: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Innovative new ideas
Instances	Senior management

"Use of digital collaboration tools (e.g., Microsoft Teams) supports real-time idea sharing and cross-functional collaboration. Cloud technologies and e-learning platforms enable upskilling. AI offers significant new opportunities when applied responsibly".

The finding highlights how crucial it is to have an innovative culture within the company where originality and forward-thinking are welcomed. This entails fostering an atmosphere where

workers are encouraged to try new things, take measured chances, and come up with innovative ideas without worrying about failing.

5.4.2.14. Subtheme: Leadership role in encouraging Innovation

Table 5.4.2.14: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Culture of innovation
Instances	Senior management

An Output Portfolio Workshops that bring together Finance, Supply Chain, and ICT for joint brainstorming. The need for IT to help automate forms, processes, and reporting (e.g., dashboards). The main challenge is having sufficient ICT resources to implement these ideas.

The finding shows that teamwork to produce new ideas and innovative solutions, and collaborative brainstorming, is a major factor in developing an innovative culture. Through organized brainstorming sessions that bring together a variety of viewpoints, staff members are inspired to think creatively, question presumptions, and investigate new ideas.

5.4.2.15. Subtheme: Supporting Staff in Proposing Creative IT Ideas

Table 5.4.2.15: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Creative IT ideas/culture of innovation
Instances	Senior management

"As a science council, collaboration and learning are core values. Leadership aims to foster a culture that drives excellence and efficiency. Staff are encouraged to engage, share ideas, and work together to improve"

Finding shows that by promoting cooperative idea exchange throughout teams and hierarchies, organizations can unlock a variety of viewpoints and innovative solutions. Structured brainstorming sessions that are backed by psychological safety, open communication, and well-defined goals facilitate the dismantling of silos and the emergence of innovative ideas. To ensure that ideas are recorded, assessed, and, where practical, put into practice, leadership is essential in hosting these meetings.

5.4.2.16. Subtheme: Evaluating the impact of IT projects

Table 5.4.2.16: Responses with reference to data

Ontology element	**Description**
Concepts	IT projects
Relationships	Organisational staff and Senior management
Functions	Organisational programs
Axioms	IT projects impact
Instances	Senior management and Executive

"Project impact should be evaluated by involving actual business users. where the loudest voices get attention, rather than a structured, value-based evaluation. He recommended creating a body representing business needs to assess proposals, measure outcomes, and hold requesters accountable for promised benefits".

The finding shows the value of collaborative brainstorming as a major factor in promoting an innovative culture. Facilitating conversations is a critical function of leadership, which ensures an inclusive and transparent workplace where all staff members are encouraged to participate.

5.4.2.17. Sub-theme: Incorporating IT into business operations

Table 5.4.2.17: Responses with reference to data

Ontology element	**Description**
Concepts	Incorporating IT
Relationships	IT team
Functions	Organisational processes
Axioms	Business operations
Instances	IT team

"Currently, projects follow formal project management with implementation tracking and close-out meetings to assess outcomes. A need for better systems to formally measure impact on service delivery and performance".

The finding shows that currently, projects follow official project management procedures, such as close-out meetings to assess results and organized implementation tracking. Although these procedures ensure accountability and goal alignment, stronger processes are needed to properly assess how IT projects affect service delivery and organizational performance. Deeper insights into how technology investments result in observable improvements like increased customer satisfaction, cost savings, or efficiency gains may be obtained by putting key performance indicators (KPIs), and post-implementation assessments into practice. Enhancing these assessment tools would help businesses measure return on investment, improve tactics, and guarantee ongoing alignment with corporate objectives, all of which would contribute to the long-term benefits of IT initiatives.

5.4.2.18. Subtheme: Improvements to IT Governance Procedures

Table 5.4.2.18: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance procedures
Relationships	Senior management
Functions	Organisational processes and procedures

Axioms	IT governance improvements
Instances	Senior management and Executive

Address unintegrated and manual systems, particularly in procurement. Tighten software usage and licensing controls. Improve infrastructure maintenance despite funding constraints.

Finding shows that there are several crucial operational issues that impede efficiency and transparency, such as manual and disjointed procurement methods. To cut expenses and guarantee compliance, the necessity to strengthen software usage and licensing restrictions. Budgeting for an improved infrastructure would assist in the efficiency and effectiveness of the processes and organizational performance.

5.4.2.19. Subtheme: Tools to enhance Digital Integration and IT Governance

Table 5.4.2.19: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance and digital integration
Relationships	Senior management
Functions	Organisational tools
Axioms	IT functions and processes
Instances	Senior management and Executive

"More understanding and proper use of AI, balanced with safeguards. Leverage new tools that can unlock efficiency and innovation".

The finding shows that there is a need for greater comprehension and responsible use of AI technologies, as they support a deliberate and well-rounded approach to AI adoption. While acknowledging AI's potential to spur creativity and efficiency, AI tools need to be leveraged to its fullest potential.

5.4.2.20. Subtheme: Observations on Digital Technology and IT Governance in SOEs

Table 5.4.2.20: Responses with reference to data

Ontology element	Description
Concepts	Digital technology, IT governance
Relationships	Senior management
Functions	IT systems
Axioms	IT functions and processes
Instances	Senior management and Executive

"Digital tools enhance accountability and transparency. A more streamlined, standardized approach across departments to avoid duplication and better align with national objectives. The high cost of commercial software like Microsoft, and Africa developing its own affordable solutions. Government bodies like SITA explore more cost-effective ICT solutions".

5.4.3. Theme 1: Analyse information technology guidelines and practices

5.4.3.1. Sub-theme: Proper procedures support

Table 5.4.3.1: Responses with reference to data

Ontology element	Description
Concepts	Policy, procedures, Functionality, Risk, Compliance
Relationships	Stakeholder Influence on IT Governance Priorities
Functions	Regulations, IT strategy/Frameworks, Policies
Axioms	National Digital Policies
Instances	Executive

"IT policies in SOEs are crucial but must be practical and tailored to each organization rather than generic, overly theoretical documents. Over-regulation often hampers effectiveness. Policies should focus on enabling efficiency and effectiveness rather than merely policing compliance. SOEs generally operate with limited resources; hence, policies must guide staff toward lean and executable processes".

Finding shows that IT policies at State-Owned Entities (SOEs) allow effectiveness, structure, and flexibility to be balanced. Excessive regulation and rigid or general regulations frequently hinder innovation and operational effectiveness while ignoring the requirements of any organization. Rather, rules ought to be realistic, flexible, and customized to the unique operational, cultural, and technological circumstances of the SOE. A focus on practical execution and quantifiable results guarantees that IT governance boosts productivity rather than becoming a bureaucratic roadblock.

5.4.3.2. Subtheme: Opportunities and problems

Table 5.4.3.2: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions and strategy alignment
Relationships	Employees in the organisation
Functions	Compliance, processes, and agility
Axioms	Organisational functions
Instances	Senior management

"Many SOEs lag in adopting modern technologies, partly due to rigid regulatory requirements. Compliance should deliver tangible benefits rather than exist for ticking boxes. Overly strict compliance enforced by external audits often increases costs without adding value. SOEs should develop an appetite for risk to remain competitive and relevant".

Finding shows that rigid regulatory frameworks that put compliance ahead of innovation are a major reason why many State-Owned Entities (SOEs) find it difficult to keep up with technological

improvements. Regulations shouldn't be viewed as pointless checklists; instead, they should be created to increase competitiveness, efficiency, and security.

5.4.3.3. Subtheme: Impact of emerging Technologies on IT policies

Table 5.4.3.3: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions, emerging technologies
Relationships	Employees in the organisation
Functions	Processes
Axioms	Decision making
Instances	Senior management/ Executive

"Emerging technologies present significant opportunities for SOEs to modernize IT procedures. New technologies should be used to streamline processes, making them lighter and more agile. Implementing new technologies should coincide with reviewing and updating old business processes to ensure alignment".

Finding shows that automation, cloud computing, and artificial intelligence (AI) present SOEs with a significant chance to update outdated IT procedures and boost operational effectiveness. However, because of strict regulatory frameworks, risk-averse cultures, or outdated systems, many SOEs are still slow to implement these technologies. SOEs should adopt a more proactive strategy, giving pilot projects, agile implementation, and collaborations with IT suppliers top priority if they want to fully benefit from these developments. SOEs can enhance service delivery, cut expenses, and maintain their competitiveness by deliberately implementing new technologies.

5.4.3.4. Subtheme: Stakeholder engagement in developing IT guidelines

Table 5.4.3.4: Responses with reference to data

Ontology element	**Description**
Concepts	IT guidelines
Relationships	Stakeholders and the organization

Functions	Effective processes
Axioms	Stakeholder engagement
Instances	Senior management/ Executive

"Stakeholder engagement is crucial in developing IT guidelines. Engaging management helps them understand the risks and benefits, ensuring buy-in and smoother implementation. Stakeholders, being accountable for the risks, must be involved to make informed decisions".

The above assertion highlights that, to obtain leadership buy-in and ensure alignment with organizational goals, the finding suggests that the importance of stakeholder engagement should be considered while defining IT standards in SOEs. IT teams may better convey the risks and strategic advantages of suggested policies by actively incorporating management in the process. This promotes a deeper comprehension of cybersecurity issues, operational efficiency, and potential for digital transformation. Bridging the divide between technical and non-technical decision-makers, this cooperative approach helps avoid resistance to change and ensures that IT policies are not just compliant but also useful and value-driven. Broad stakeholder involvement results in IT governance frameworks that are better informed, more widely accepted.

5.4.3.5. Subtheme: Incorporating Cybersecurity into IT Guidelines

Table 5.4.3.5: Responses with reference to data

Ontology element	**Description**
Concepts	IT guidelines, cybersecurity
Relationships	Organisation
Functions	Effective processes
Axioms	High-level decision makers
Instances	Senior management/ Executive

"Cybersecurity should not stand as a separate compliance requirement but should be embedded into standard workflows and best practices. Security considerations should be part of design, administration, and operations rather than isolated in a standalone policy. Integrating cybersecurity into daily operations ensures that it becomes a natural part of the organization's culture and practices".

Instead of being viewed as a separate compliance need, cybersecurity needs to be smoothly incorporated into daily operations based on the participants response. Organizations get stronger protection with less opposition when security measures are integrated into staff routines, standard workflows. This strategy minimizes interruptions while lowering vulnerabilities by ensuring that cybersecurity becomes an inherent component of procedures, including software development, data administration, and dealings with third-party vendors.

Theme 2: The impact emerging technologies have on SOEs' demand for modern IT procedures and Strategy alignment.

5.4.3.6. Subtheme: Alignment of IT Strategy with SOE Goals

Table 5.4.3.6: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"In most SOEs, the IT department operates lower down the hierarchy, resulting in a reactive rather than proactive strategy. There is a need for IT to be elevated to the executive level, similar to

finance, so that the IT strategy becomes integral to the organizational strategy. External consultants often provide generic strategies that become difficult to implement due to a lack of representation at the decision-making level".

Positioning IT department's lower in the organizational hierarchy of many state-owned enterprises (SOEs) frequently restricts its strategic influence. Due to this institutional arrangement, IT is more often reduced to a support role than a catalyst for innovation, resulting in a reactive strategy where IT only addresses urgent operational requirements rather than proactively influencing corporate strategy. IT projects are usually deprioritized when they do not have a seat at the leadership table, which leads to obsolete systems, ineffective procedures, and lost chances for digital transformation.

5.4.3.7. Subtheme: Why is this alignment critical?

Table 5.4.3.7: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"Given that technology is the foundation of contemporary businesses, facilitating efficiency, innovation, and competitive advantage, alignment between IT and business strategy is essential. Organizations lose out on opportunities to take advantage of digital transformation, data-driven decision-making, and automation, all of which are critical factors in resilience and growth when IT functions in isolation or as just a support function".

Technology expenditures that directly support company objectives, including enhancing service delivery and streamlining processes, are certain by a proactive IT strategy. Without this alignment,

SOEs run the danger of falling behind more agile competitors, incurring more operating expenses, and having to contend with outdated technologies that limit scalability. Effective use of emerging technologies, agility, and future readiness are all enhanced when IT is incorporated into strategic decision-making.

5.4.3.8. Subtheme: Incorporating Stakeholder Input in the IT Strategy

Table 5.4.3.8: Responses with reference to data

Ontology element	**Description**
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs
Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"Elevating IT to the executive level ensures better collaboration with other departments and stakeholders. This alignment facilitates effective teamwork in defining a strategy that supports the SOE's main objectives and priorities".

The findings highlight that cross-functional cooperation and strategy alignment are improved throughout the company when the IT department is promoted to the executive level. Businesses can make sure that IT projects are strongly linked to overall corporate objectives by incorporating IT leadership into high-level decision-making.

5.4.3.9. Subtheme: SOE's current IT strategy supports its strategic priorities

Table 5.4.3.9: Responses with reference to data

Ontology element	**Description**
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs

Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"The current IT strategy generally supports the company's strategic priorities. Critical KPI should be for the executive to make available the necessary funding. While strategies are well-defined, a lack of adequate budgeting often hampers implementation, resulting in strategies not becoming true enablers for the business".

Although the company's present IT strategy is in line with its larger strategic aims, obtaining adequate funding and management backing is essential to its efficacy. They underlined that to guarantee effective resource allocation, which would support innovation, digital transformation, and long-term competitiveness, IT investments must be given top priority. The prompt and adequate availability of funds to support IT efforts should be a key performance indicator (KPI) for leadership, since underinvestment can result in operational inefficiencies, security flaws, and lost development prospects.

5.4.3.10. Subtheme: Link between Organisational Goals and Employee KPIs

Table 5.4.3.10: Responses with reference to data

Ontology element	**Description**
Concepts	Organisational goals, Key performance indicators (KPI's)
Relationships	Link employees KPI's with organisational goals
Functions	Employees' KPI, performance scorecard
Axioms	Reporting and accountability
Instances	Executive

"*To ensure alignment, accountability, and quantifiable progress at all organisational levels, the relationship between individual Key Performance Indicators (KPIs) and organisational goals is crucial. Employee KPIs provide a clear road map for how team and individual contributions propel organizational performance when they are directly derived from overarching business objectives".*

From an interpretvist stance, organizations create a cohesive workforce where each employee is aware of their involvement in accomplishing the larger vision by cascading high-level goals into departmental and individual KPIs. By following this approach, better performance monitoring, focused resource allocation, and quick modifications when priorities change will also be made possible by this alignment. This allows employees to also contribute to the organisational performance.

5.4.3.11. Subtheme: Departmental communication

Table 5.4.3.11: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy coordination
Relationships	Departmental communication
Functions	Staff processes
Axioms	IT strategy coordination
Instances	Senior management and IT team

"IT staff often work in isolation and fail to communicate their contributions effectively. Improved communication, showing stakeholders what is being done and why, would help the business understand IT's impact and enable better prioritization of limited resources".

Without explicitly communicating their value to stakeholders, IT staff frequently work in technical silos, concentrating on system maintenance and troubleshooting. Misunderstandings, a lack of

respect for the importance of IT, and misplaced objectives can result from this lack of visibility. Proactive communication techniques that convert technical accomplishments into observable business results, like frequent updates, dashboards, and business-friendly reports, are necessary for IT teams to close this gap.

Theme 3: Role of stakeholders in creating IT guidelines and fostering a culture of innovation by leveraging information technology capabilities.

5.4.3.12. Sub-theme: Regular IT Strategy Evaluations

Table 5.4.3.12: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy
Relationships	IT section/ CIO and IT managers
Functions	IT team
Axioms	IT strategy evaluations
Instances	Executive and IT team

"IT operates in a dynamic environment; therefore, strategies cannot remain static. annual reviews of the IT strategy during the business planning process to ensure alignment with evolving technologies and organizational changes".

Since technology is constantly changing, IT strategies must also be flexible and agile rather than static or old-fashioned. As part of the larger business planning cycle, IT plans should be reviewed annually to ensure ongoing alignment with business objectives. To make sure that IT investments stay impactful and relevant, these evaluations enable organisations to evaluate new technology, changing cybersecurity threats, changing market needs, and internal operational changes. Leadership may proactively modify objectives, distribute resources efficiently, and seize innovation possibilities by including IT strategy talks into routine business planning.

5.4.3.13. Subtheme: Fostering a Culture of Innovation

Table 5.4.3.13: Responses with reference to data

Ontology element	Description
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Innovative new ideas
Instances	Senior management

"IT should focus on providing core services and capabilities, giving business units the freedom to innovate within their domains. IT should avoid dictating specialized tools outside its expertise and instead maintain stable core systems".

To guarantee operational stability and effectiveness, IT should place a high priority on providing fundamental services that are scalable, safe, and dependable, such as enterprise systems, cybersecurity, and infrastructure. IT empowers business units to create independently within their areas by securing these fundamental competencies, using technology as an enabler rather than a constraint.

5.4.3.14. Subtheme: Leadership's role in encouraging Innovation

Table 5.4.3.14: Responses with reference to data

Ontology element	Description
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Culture of innovation
Instances	Senior management

"Organizational leadership must stress the competitive advantage of adopting new technologies. Leadership should help staff understand that innovation is vital to staying ahead of market competitors".

As a key source of competitive advantage, organizational leadership must promote the strategic adoption of new technology. Even well-established businesses risk becoming outdated in today's quickly changing digital market if they delay in technical innovation. Adopting new technology allows for the organisational processes to be effective and improve employees' productivity.

5.4.3.15. Subtheme: Supporting Staff in Proposing Creative IT Ideas

Table 5.4.3.15: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Creative IT ideas/culture of innovation
Instances	Senior management

"In research-focused environments, staff naturally generate and test new ideas. However, within IT, innovation should be handled by a dedicated specialist group that balances enterprise stability with adopting new technologies. Pushing all IT staff to innovate could distract from essential operational responsibilities".

Employees in research-driven environments regularly come up with new concepts and test new concepts as part of their daily tasks. To guarantee that innovation in IT is in line with operational stability and organizational risk tolerance, a more structured approach is needed in the organisation. A committed specialised team, like a digital transformation team or IT innovation lab, can successfully strike a compromise between enterprise dependability and experimentation. To minimize interruptions to vital systems, this team would assess, test, and scale new technology. Organizations can choose solutions with the greatest strategic impact, retain strong governance

over IT infrastructure, and promote controlled agility by centralizing innovation initiatives. This strategy ensures that new technology is embraced in a way that is safe, sustainable, and aligned with corporate goals.

5.4.3.16. Subtheme: Evaluating the Impact of IT Projects

Table 5.4.3.16: Responses with reference to data

Ontology element	**Description**
Concepts	IT projects
Relationships	Organisational staff and Senior management
Functions	Organisational programs
Axioms	IT projects impact
Instances	Senior management and Executive

"Project impact should be evaluated by involving actual business users. The current "foghorn principle," where the loudest voices get attention, rather than a structured, value-creating body representing business needs to assess proposals, measure outcomes, and hold requesters accountable for promised benefits".

A significant flaw in the way IT projects impact needs to be evaluated is that it depends more on ad hoc feedback than on a systematic, user-centered assessment procedure. Organisations should create a cross-functional governing body with explicit accountability for outcome measurement to address this. The participants' response underscores that to evaluate ideas against predetermined criteria, firms could instead set up a cross-functional governing council that consists of actual end users, process owners, and IT stakeholders.

5.4.3.17. Sub-theme: Incorporating IT into business operations

Table 5.4.3.17: Responses with reference to data

Ontology element	**Description**
Concepts	Incorporating IT

Relationships	IT team
Functions	Organisational processes
Axioms	Business operations
Instances	IT team

"Dual role includes deploying new solutions and managing operational ERP systems. AI tools could speed up coding work, freeing developers to focus on optimization. Better IT tools for record-keeping and communication would support maintaining multiple bespoke solutions and improve internal effectiveness".

Innovation and operational stability are constantly at odds due to IT's twin duty, which is to install state-of-the-art solutions while preserving mission-critical ERP systems. This speeds up the delivery of new solutions and lessens the manual labor required of developers, freeing them up to concentrate on higher-value tasks like improving data architectures, integrating newer technologies into business processes, or enhancing ERP performance should be a priority.

5.4.3.18. Subtheme: Improvements to IT Governance Procedures

Table 5.4.3.18: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance procedures
Relationships	Senior management
Functions	Organisational processes and procedures
Axioms	IT governance improvements
Instances	Senior management and Executive

"IT governance procedures must be clearly defined to help manage competing priorities. Requesters must present their proposals to a governance committee, which should direct the IT department based on organizational needs, ensuring alignment and effective resource allocation".

Clearly defined processes are necessary for effective IT governance to impartially assess and rank conflicting demands. Every project proposal should be evaluated by a structured governance committee made up of cross-functional leaders using uniform standards, including risk, ROI, strategic alignment, and resource viability. Transparency is ensured by requiring requesters to formally submit their arguments, and committee scrutiny ensures that corporate needs rather than personal influence are driving IT projects.

5.4.3.19. Subtheme: Tools to enhance Digital Integration and IT Governance

Table 5.4.3.19: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance and digital integration
Relationships	Senior management
Functions	Organisational tools
Axioms	IT functions and processes
Instances	Senior management and Executive

"A large portion of the IT department's primary role is to maintain operations ("keep the lights burning"), which is not glamorous but critical. Encouraging IT staff to search for new ideas without a dedicated innovation function could jeopardize operational stability. Creating a specialist group with enterprise-wide experience to focus on introducing disruptive technologies while maintaining stability and readiness".

Operational continuity, ensuring that systems function properly, safely, and dependably, is frequently the primary goal of IT. While innovation is important, relying on IT teams to come up with ideas and execute them on the fly without a formal framework runs the danger of taking focus away from maintenance that is vital to the operation of the business and may cause core services to become unstable.

5.4.3.20. Subtheme: Observations on Digital Technology and IT Governance in SOEs

Table 5.4.3.20: Responses with reference to data

Ontology element	Description
Concepts	Digital technology, IT governance
Relationships	Senior management
Functions	IT systems
Axioms	IT functions and processes
Instances	Senior management and Executive

"IT department implemented a Plan-Build-Run structure to break away from traditional application vs. infrastructure silos".

To promote end-to-end accountability and agility, the IT department implemented a Plan-Build-Run (PBR) procedure to break down old silos between application and infrastructure teams. This run ensures smooth operations with distinct ownership. Build provides solutions through cross-functional collaboration, and Plan concentrates on strategic roadmaps and requirements. The PBR structure enhances system stability, speeds up delivery, and removes handoff inefficiencies by directing teams toward results rather than technical areas.

5.4.4. Theme 1: Analyse information technology guidelines and practices

5.4.4.1. Sub-theme: Proper procedures support

Table 5.4.4.1: Responses with reference to data

Ontology element	Description
Concepts	Policy, procedures, Functionality, Risk, Compliance
Relationships	Stakeholder Influence on IT Governance Priorities
Functions	Regulations, IT strategy/Frameworks, Policies
Axioms	National Digital Policies
Instances	Executive

"It is critically important. ICT governance, policies, and procedures guide all stakeholders on acceptable practices, compliance, and general best practices".

IT governance framework, policies, and procedures are crucial as they provide stakeholders, such as staff, management, and outside partners, with assurance that acceptable standards, legal compliance, and industry best practices are followed. By laying down precise rules, these governance systems reduce risks like data breaches, system malfunctions, and non-compliance with legal requirements while guaranteeing uniformity, security, and effectiveness in ICT operations. By encouraging accountability, coordinating IT initiatives with organizational objectives, and fostering a culture of responsible technology use, they eventually improve digital system trust and overall operational integrity.

5.4.4.2. Subtheme: Opportunities and problems

Table 5.4.4.2: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions and strategy alignment
Relationships	Employees in the organisation
Functions	Compliance, processes, and agility
Axioms	Organisational functions
Instances	Senior management

"Strong policies provide clear guidelines on acceptable and unacceptable practices. Opportunities include leveraging general trends in ICT, such as artificial intelligence, with clear guidelines on usage to ensure ethical practices, privacy, and productivity improvements. Proper policies help address questions around new technologies and trends and provide solutions to potential organizational challenges".

Strong ICT policies are crucial since they set forth precise rules on what constitutes appropriate and inappropriate behavior, guaranteeing uniformity and accountability throughout the company.

By creating organised frameworks for its moral and responsible use, they also identified chances to capitalise on new ICT trends, such as artificial intelligence (AI). Organizations may capitalise on AI's advantages while reducing risks such as prejudice, privacy violations, and misuse by implementing AI governance into their rules. In the end, this strategy supports safe and sustainable digital transformation by encouraging innovation and bringing technology developments into compliance with legal and moral requirements.

5.4.4.3. Subtheme: Impact of emerging Technologies on IT policies

Table 5.4.4.3: Responses with reference to data

Ontology element	**Description**
Concepts	Policy, ICT functions, emerging technologies
Relationships	Employees in the organisation
Functions	Processes
Axioms	Decision making
Instances	Senior management/ Executive

"Emerging technologies constantly challenge existing IT procedures and policies, which can quickly become outdated. Regular review of guidelines is necessary to ensure they remain relevant, address new risks, and align with modern practices. Using Artificial Intelligence (AI) to develop procedures or frameworks requires clear usage guidelines to ensure ethical compliance and address copyright issues".

New technologies such as blockchain, IoT, and AI are constantly challenging current IT policies and procedures, making them obsolete if they are not routinely evaluated and updated. They underlined the necessity of flexible governance structures that can keep up with the quick changes in technology while upholding ethical, legal, and security norms. It was noted that proactive policy changes, ongoing stakeholder education, and adaptable risk management techniques are essential ways to guarantee that IT governance continues to function well in a changing digital environment. Organizations may reduce risks, take advantage of innovation opportunities, and maintain strong, future-ready ICT practices by staying ahead of technology advancements.

5.4.4.4. Subtheme: Stakeholder engagement in developing IT guidelines

Table 5.4.4.4: Responses with reference to data

Ontology element	Description
Concepts	IT guidelines
Relationships	Stakeholders and the organisation
Functions	Effective processes
Axioms	Stakeholder engagement
Instances	Senior management/ Executive

"Stakeholder engagement is crucial in developing IT guidelines for SOEs. Engaging stakeholders allows them to contribute workable ideas, ensures relevance and practicality, and fosters buy-in and compliance since they feel consulted and represented."

To create IT guidelines for State-Owned Enterprises (SOEs) that are inclusive, transparent, and in line with diverse needs, stakeholder interaction is essential. Government regulators, industry professionals, internal management, and end users can all be included in the policymaking process to help SOEs develop comprehensive IT frameworks that address public accountability, operational efficiency, and compliance. Additionally, collaborative involvement incorporates practical suggestions, reduces resistance to change, and promotes ownership and adherence to norms. This collaborative approach improves trust, fortifies governance, and guarantees that IT policies are sustainable and pertinent to SOEs' public service mandates.

5.4.4.5. Subtheme: Incorporating Cybersecurity into IT Guidelines

Table 5.4.4.5: Responses with reference to data

Ontology element	Description
Concepts	IT guidelines, cybersecurity
Relationships	Organisation
Functions	Effective processes

Axioms	High-level decision makers
Instances	Senior management/ Executive

"Cybersecurity should be a transparent element embedded throughout all guidelines and everyday practices. By creating a culture of cybersecurity awareness, threats can be more easily identified and managed".

The findings underlines that cybersecurity needs to be a clear and essential component integrated into all IT policies and day-to-day operations. They emphasized that firms are exposed to changing threats when cybersecurity is neglected or treated as a stand-alone compliance duty. Resilience is instead ensured by a proactive, culture-centric strategy that integrates security awareness, risk mitigation, and best practices into all processes.

Theme 2: The impact emerging technologies have on SOEs' demand for modern IT procedures and Strategy alignment

5.4.4.6. Subtheme: Alignment of IT Strategy with SOE Goals

Table 5.4.4.6: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"The organization currently has clear business strategies and aligns its ICT strategies accordingly. More extensive consultation with broader ICT leadership, including team leads and specialists, to uncover insights that can better align strategies and enhance implementation".

Having clear business strategies that successfully integrate its IT strategy to support the goals to improve performance ensures organisational success. This linkage ensures that ICT initiatives and investments directly support long-term organizational objectives, service delivery, and operational effectiveness. The corporation avoids silos processes, maximizes resource usage, and strategically supports innovation by combining ICT strategy with business priorities.

5.4.4.7. Subtheme: Why is this alignment critical?

Table 5.4.4.7: Responses with reference to data

Ontology element	**Description**
Concepts	Strategic plan, Goals
Relationships	Alignment
Functions	Governance and planning, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Board committee, IT management, and executive

"The alignment with top-level organizational goals ensures coherence and effectiveness. Improved understanding of business goals through more formal and focused sessions rather than ad hoc meetings would strengthen alignment and performance".

Coherence, strategic focus, and operational performance are all dependent on ICT initiatives being in line with high-level corporate objectives. This alignment makes it possible for ICT to truly support business goals, fostering innovation, streamlining procedures, and improving service delivery in harmony with the aim of the company. The organisation avoids dispersed efforts, guarantees effective resource allocation, and shows quantifiable return on ICT investments by preserving this strategic synergy.

5.4.4.8. Subtheme: Incorporating Stakeholder Input in the IT Strategy

Table 5.4.4.8: Responses with reference to data

Ontology element	**Description**
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs
Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"Conducting focused strategic sessions with business units before budget and strategy development. Early and ongoing engagement will ensure ICT strategies reflect the organization's main objectives and priorities, making them more practical and achievable".

As a best practice to ensure that ICT projects are closely matched with operational demands and organisational priorities, the participants highly advised holding targeted strategic discussions with business units before budget and strategy formulation. ICT would be able to customize its roadmap to directly support business objectives by using these meetings as a platform to jointly identify pain areas, upcoming opportunities, and skill shortages. The organisation may reduce effort duplication, prioritize high-impact investments, and promote cross-functional ownership of digital transformation objectives by involving unit leaders early in the planning cycle.

5.4.4.9. Subtheme: SOE's current IT strategy supports its strategic priorities

Table 5.4.4.9: Responses with reference to data

Ontology element	**Description**
Concepts	IT Strategy
Relationships	Incorporating stakeholder inputs

Functions	Stakeholder engagement, monitoring, and evaluation
Axioms	Reporting, transparency, and accountability
Instances	Stakeholders, IT management, and executive

"The importance of planning to ensure the budget aligns with the strategy for the following year is one of the crucial things. Clear communication upfront is necessary to involve ICT in strategic sessions. Aligning the budget and strategic sessions correctly will help the ICT team understand organizational goals better and align themselves accordingly".

Careful preparation is necessary to guarantee that the organization's strategic aims for the next year are completely reflected in the ICT budget. To proactively incorporate ICT leadership in strategic discussions with business divisions and guarantee that technological considerations are ingrained in decision-making from the beginning, they emphasized the importance of early and transparent communication. The corporation may precisely determine resource requirements, rank initiatives with the greatest economic impact, and steer clear of reactive or misaligned investments by incorporating ICT into the planning stage. In addition to maximizing financial planning, this strategy promotes teamwork and guarantees that ICT provides quantifiable value while advancing and changing corporate objectives.

5.4.4.10. Subtheme: Link between Organisational Goals and Employee KPIs

Table 5.4.4.10: Responses with reference to data

Ontology element	**Description**
Concepts	Organisational goals, Key performance indicators (KPI's)
Relationships	Link employees KPI's with organisational goals
Functions	Employees' KPI, performance scorecard
Axioms	Reporting and accountability

Instances	Executive

"The current IT strategy covers several points but only focuses on key aspects, leading to misalignment with overall strategic priorities. There is insufficient measurement of aspects such as staff training, attending conferences and seminars, and staying up to date with technological trends. While enterprise architecture sessions exist, there should be a culture where every staff member takes responsibility for updating their knowledge. There is a need for better quality assurance to ensure KPIs reflect strategic priorities".

Although the current IT strategy covers important operational aspects, the participant acknowledges that its narrow focus causes it to be misaligned with the organisation's overall strategic priorities. Important shortcomings such as inadequate attention to new technological developments and the absence of quantifiable frameworks for staff development. Despite doing enterprise architecture classes, participants stressed the importance of cultivating a shared accountability culture in which all staff members actively improve their abilities and align with changing IT goals.

5.4.4.11. Subtheme: Departmental communication

Table 5.4.4.11: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy coordination
Relationships	Departmental communication
Functions	Staff processes
Axioms	IT strategy coordination
Instances	Senior management and IT team

"Effective departmental communication is essential to ensure everyone, not just within ICT but across the organization, understands IT strategic priorities. Regular quarterly meetings should be

held to communicate updates and report on progress against the IT strategy. This will help maintain alignment and synergy".

Effective cross-departmental communication is essential to ensure that all stakeholders, both inside and outside of Information and Communication Technology (ICT*),* comprehend and concur with IT strategic priorities. Inconsistent communications frequently result in implementation that is not aligned, redundant efforts, and lost chances for cooperation.

Theme 3: Role of stakeholders in creating IT guidelines and fostering a culture of innovation by leveraging information technology capabilities

5.4.4.12. Sub-theme: Regular IT Strategy Evaluations

Table 5.4.4.12: Responses with reference to data

Ontology element	**Description**
Concepts	IT strategy
Relationships	IT section/ CIO and IT managers
Functions	IT team
Axioms	IT strategy evaluations
Instances	Executive and IT team

"Frequent evaluations are crucial because the operating environment is dynamic, influenced by politics, economics, and global factors. Regular PESTEL analyses should inform adjustments to the IT strategy, such as adjusting for budget constraints or geopolitical tensions, which may necessitate changes in technology choices. Flexibility is needed to adapt the strategy and maintain relevance and sustainability".

In today's unstable operating environment, where political changes, economic ups and downs, and global disruptions can quickly change objectives, regular, systematic assessments of the IT strategy are essential. To proactively identify external risks and opportunities, they promoted quarterly PESTEL (Political, Economic, Social, Technological, Environmental, and Legal)

evaluations. Examples of these include budget cuts brought on by economic downturns or cybersecurity threats made worse by geopolitical conflicts. The IT strategy should then be agilely adjusted in response to these insights, guaranteeing its relevance and strength.

5.4.4.13. Subtheme: Fostering a Culture of Innovation

Table 5.4.4.13: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Innovative new ideas
Instances	Senior management

"IT can be a catalyst for innovation by leveraging new trends and technologies. Young employees are generally adept at using new technologies and should be encouraged to showcase innovative uses. Policies and procedures should foster innovation and provide incentives to encourage it. Leadership must consciously address innovation through governance, policies, and rewarding innovative ideas".

The transformative potential of IT as an innovation driver, and new technologies, like artificial intelligence (AI) and low-code platforms, can completely rethink services, processes, and even business models. Employees who frequently embrace new technologies first are an invaluable asset for developing creative solutions. To capitalise on this, set up organised platforms like innovation labs, hackathons, or "tech spotlight" forums where groups present innovative use cases for employees to test, develop, and exchange ideas.

5.4.4.14. Subtheme: Cross-departmental Collaboration

Table 5.4.4.14: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT

Relationships	Organisational staff
Functions	Senior management
Axioms	Culture of innovation
Instances	Senior management

"Cross-functional teams can help identify challenges and innovative solutions. Sharing sessions, such as AI enthusiast meetings, are valuable platforms for staff to showcase productivity-enhancing tools and share best practices".

Bringing together a variety of viewpoints and areas of expertise, cross-functional teams are essential in identifying operational problems and jointly developing creative solutions. The importance of organised knowledge-sharing forums where staff members from various departments can demonstrate productivity tricks, automation tools, or creative applications of cutting-edge technologies, such as hackathons, monthly "Tech Talk" meetings, or circles for AI enthusiasts. Exposing grassroots creativity, these forums dismantle organisational walls and promote an environment where IT-driven efficiency improvements are disseminated and expanded throughout the entire company. For instance, a finance team member's AI-powered workflow optimization, demonstrated in such a session, could inspire similar improvements in HR or logistics. The organisation speeds up digital maturity by formalizing these interactions and converting ad hoc creativity into repeatable innovation processes.

5.4.4.15. Subtheme: Leadership's Role in Encouraging Innovation

Table 5.7.4.15: Responses with reference to data

Ontology element	**Description**
Concepts	Innovation and evolution of IT
Relationships	Organisational staff
Functions	Senior management
Axioms	Creative IT ideas/culture of innovation
Instances	Senior management

"Leadership plays a vital role in setting an innovative culture. Providing an environment that supports new generations' expectations for flexibility and innovation is important for employee engagement. Innovation should be celebrated and recognized in KPIs and the organization's culture".

The cornerstone of cultivating an innovative culture is leadership commitment. By establishing clear goals, assigning resources, and modeling behaviors that value flexibility and forward-thinking, leaders may actively encourage creativity, risk-taking, and ongoing learning. This entails establishing an atmosphere that meets the expectations of the younger generation in the workplace, including venues for idea sharing, flexibility in work schedules, and chances for experimentation.

5.4.4.16. Subtheme: Supporting Staff in Proposing Creative IT Ideas

Table 5.7.4.16: Responses with reference to data

Ontology element	**Description**
Concepts	IT projects
Relationships	Organisational staff and Senior management
Functions	Organisational programs
Axioms	IT projects impact
Instances	Senior management and Executive

"The key point is to have structures that support staff in proposing and testing new ideas".

For employees at all levels to effectively propose, develop, and test new ideas, the organisation must put in place clear, accessible mechanisms. This entails providing specialized resources and formalizing procedures such as innovation pipelines with phased gates for concept submission, review, and piloting.

5.4.4.17. Sub-theme: Incorporating IT into business operations

Table 5.4.4.17: Responses with reference to data

Ontology element	**Description**

Concepts	Incorporating IT
Relationships	IT team
Functions	Organisational processes
Axioms	Business operations
Instances	IT team

"Incorporating IT into operations should focus on leveraging tools and trends to enhance performance and efficiency".

IT integration must proactively use cutting-edge technologies and new trends, like cloud-based collaboration platforms, IoT-enabled data collecting, and AI-driven automation, to optimize workflows, remove duplications, and support data-driven decision-making to optimize operational effect.

5.4.4.18. Subtheme: Improvements to IT Governance Procedures

Table 5.4.4.18: Responses with reference to data

Concepts	IT governance procedures
Relationships	Senior management
Functions	Organisational processes and procedures
Axioms	IT governance improvements
Instances	Senior management and Executive

"Automating as many processes as possible to move away from paper-based and semi-electronic forms should be a priority. Having quality data with integrity is critical since data is the "new oil." Clean, well-structured data can be used for trend analysis, business intelligence, and informed decision-making. The lack of reliable data limits the benefits of automation; therefore, full automation should aim to produce data that is reliable and usable for analytics".

Given that manual workflows are prone to inefficiencies, errors, and delays, automating procedures to do away with paper-based and semi-electronic systems should be a primary goal. Organisations can greatly improve speed, accuracy, and scalability by digitizing and automating these procedures, which include data entry, reporting, and approvals. However, as the lifeblood of contemporary operations, high-quality, trustworthy data must be the foundation upon which automation is constructed.

5.4.4.19. Subtheme: Tools to enhance Digital Integration and IT Governance

Table 5.4.4.19: Responses with reference to data

Ontology element	**Description**
Concepts	IT governance and digital integration
Relationships	Senior management
Functions	Organisational tools
Axioms	IT functions and processes
Instances	Senior management and Executive

"The need for compliance tools that monitor adherence to governance frameworks. He proposed the use of AI bots and monitoring solutions to track user behavior and trends, which would help enhance governance and compliance. Automated controls and systems should be leveraged to ensure that governance requirements are met consistently"

Through proactive monitoring and enforcement of governance framework adherence, there's an increasing need for AI-powered compliance technologies. For real-time risk mitigation and audit preparation, implement intelligent monitoring bots to track user behavior, identify trends, and flag anomalies (such as unauthorized data access). Machine learning algorithms might be used, for instance, to identify trends of non-compliance in data handling or procurement procedures, producing automatic notifications for remedial action.

5.4.4.20. Subtheme: Observations on Digital Technology and IT Governance in SOEs

Table 5.4.4.20: Responses with reference to data

Ontology element	Description
Concepts	Digital technology, IT governance
Relationships	Senior management
Functions	IT systems
Axioms	IT functions and processes
Instances	Senior management and Executive

While governance policies exist, they are often developed and left static, with limited integration into new technologies. Opportunities to embed governance requirements into new systems, for example, service management solutions, by aligning system features with relevant policies and procedures. There' a need for a structured approach and for governance to be considered during technology implementation planning.

Although most governance regulations are created with the best of intentions, they frequently don't change to keep up with new technology. When adopting new systems, such as service management platforms, where governance requirements, like access restrictions, audit trails, or data retention regulations, are not proactively included during deployment, this divergence leads to gaps.

5.5. An overview of the development of IT governance in State-Owned Entities (SOEs)

Over the past few decades, State-Owned Entities' (SOEs') IT governance has changed dramatically due to the need for efficiency, transparency, and alignment with public sector goals. In contrast to private companies, state-owned enterprises (SOEs) encounter distinct obstacles such as political sway, legislative limitations, and public accountability requirements, all of which impact their IT governance structures. Early Stage Pre-2000s Important Stages of IT Governance Development in SOEs: Ad Hoc and Siloed IT, there was little enterprise-wide collaboration, and IT was frequently departmentalized. Hardware and legacy systems, as well as fundamental infrastructure over strategy alignment. Technical teams made decisions rather than business demands, and there is little institutional governance.

- 2000s–2010s: Conformity and Standardization increasing awareness of IT's role in facilitating efficient service delivery.
- Process standardization using frameworks such as COBIT, ITIL, and ISO 38500.
- SOEs are being forced to formalize their IT policies due to increased regulatory pressure.
- Challenges include bureaucratic hold-ups, opposition to change, and a lack of alignment with the demands of businesses and citizens.
- 2010s–Present: Strategic Alignment & Digital Transformation
- Transition to digital government programs.
- IT governance to more public sector objectives.
- Emergence of SOE-specific IT governance committees.
- Emphasis on including all relevant parties, including the public and private sectors.

Future Directions: Data-Driven Governance and Agile, incorporating IoT, blockchain, and AI into public services. Performance-based IT budgeting tying funds to quantifiable results. Increased resilience and cybersecurity due to growing threats to vital infrastructure. Challenges with SOE IT Governance:

- Political meddling results in priorities that are not consistent.
- Dependency on legacy systems impedes innovation.
- Gaps in skills in new technologies (like cloud and AI).
- Striking a balance between cost effectiveness and public service requirements.

The Best Practices for SOEs:

- For flexibility, use hybrid governance frameworks, such as COBIT or ITIL.
- Define specific KPIs, such as cost savings and citizen satisfaction.
- Boost cybersecurity and adherence to national laws.

IT governance is becoming a strategic concern for SOEs, which are shifting from inflexible, compliance-driven approaches to dynamic, value-focused frameworks. To succeed, though, bureaucratic inertia must be overcome, and IT investments must result in tangible public benefits.

5.6. Summary of the chapter

This chapter provided data analysis and discussed findings. This was done per theme and subthemes. addresses the main research topics of the study on the convergence of digital technologies and IT governance in State-Owned Entities (SOEs) by presenting the analysis and discussion of empirical data gathered from interviews. Using insights from individual interviews, the findings are organized topically and conform to the ontological framework (Concepts, Relationships, Functions, Axioms, Instances). Along with providing an interpretation of the data, the discussion highlights theoretical contributions and practical consequences by connecting the findings to previously published works.

CHAPTER 6: INTEPRETATION OF FINDINGS AND THE FRAMEWORK

6.1. Introduction

The previous chapter analysed data and discussed the findings. This chapter interprets the findings against existing literature and study context.

The goal of this present study was to conceptualize a framework describing how IT governance and digital technologies should be used in the context of state-owned entities. The framework is created based on findings interpretations in this chapter. The framework consists of recommendations to address the research problem stated in chapter one.

The main themes and subthemes drawn from the empirical data were discussed in the previous chapter, along with the study's important findings. A better comprehension of how the results support, refute, or build upon earlier studies is offered by the interpretation. The themes stemmed from the following elements: information technology guidelines and practices, the impact emerging technologies have on SOEs' demand for modern IT procedures, and Strategy alignment, and lastly, the role of stakeholders in creating IT guidelines and fostering a culture of innovation by leveraging information technology capabilities.

This present study employed a qualitative research approach using in-depth interviews to examine the significance of digital technologies and IT governance. The findings showed that digital technologies and IT governance are crucial in improving organisational effectiveness, strategic alignment, and decision-making. The findings underline that while digital technologies spur innovation and economic advantage, efficient IT governance frameworks ensure appropriate management of digital resources, reduce risks, and promote compliance. The study emphasizes how these components are interdependent and argues that, for businesses to attain operational excellence and sustained growth, they must combine strong IT governance with cutting-edge digital tools. These revelations highlight how crucial it is to match governance practices with technology developments to optimize organizational benefits.

This chapter presents key interpretations drawn from the study findings. The chapter lays out the findings in terms of procedures, policy, and theory. Informed by the interpretations, the chapter ends by providing a framework for the convergence of digital technologies and information technology (IT) governance in state-owned entities.

6.2. Interpretation of Objective 1 Findings: To explore and identify the comprehensive need for information technology guidelines and practices in SOE's.

Despite the organisation's adoption of information technology (IT) guidelines and practices, there remains a significant gap in the appropriate use, evaluation and improvement. Thus, despite the implementation of common IT governance frameworks, the organization does not critically evaluate whether these practices meet its unique operational requirements and strategic objectives. Frequently, organisations adopt generic rules without customisation instead of carrying out rigorous reviews, which results in inefficiencies, misplaced priorities, and resource waste. Due to a lack of proper use, IT procedures may seem sound on the surface but fall short of meeting changing technology needs or supporting business goals.

6.2.1. Interpretation of Objective 1: Findings from elements of UTAUT, DOI and Upper Echelon theories.

Through the convergent lenses of UTAUT, Diffusion of Innovation (DOI), and Upper Echelon Theory, the findings of Objective 1, establish the necessity of IT guidelines and practices in the SOE. The foundational context is established by Upper Echelon Theory, which reveals that senior managers' and managers' strategic imperatives and cognitive frames are the primary drivers of the comprehensive need for IT guidelines. The lack of a unified strategic framework is a serious risk to governance and performance. The perceived ineffectiveness and incompatibility of current ad hoc solutions are highlighted by this managerial consensus on the relative benefit of standardized practices, a crucial DOI element. This underscores the urgent need for guidelines that would be compatible with the complex, large-scale operational environment of an SOE.

6.2.2. Interpretation of Objective 1: Findings from IT governance and digital technologies framework

IT and digital technologies strategies are systematically linked with organisational objectives through an iterative, structured process that is guaranteed by a Good Governance Flow Framework. Strategic alignment is the first step, during which leadership establishes precise corporate objectives and digital priorities. Policy creation follows. Following that, implementing technologies with strong risk management, performance monitoring, and compliance checks is part of the execution and monitoring process. Stakeholder involvement ensures ongoing input from management, staff, authorities, and clients, and audit and review stages evaluate results against KPIs, promoting enhancements. Lastly, process refinement brought about by scalability and optimisation promotes creativity and agility. The three main tenets of sound governance in IT and beyond, transparency, accountability, and adaptability, are guaranteed by this cycle.

Even though there's a continuous review of IT governance, the IT department finds it difficult to quantify results, pinpoint flaws, and defend enhancements. Due to this, legacy or inefficient procedures continue to be used, which impedes creativity and adaptability to advances in technology. Organizations may be able to improve their IT and digital strategies more quickly by taking a more analytical approach that includes key performance indicators (KPIs) and benchmarking against industry norms.

Discrepancy between real business requirements and IT governance frameworks presents another difficulty in the organisation. A more thorough examination of user input, workflow requirements, and cost-benefit analyses would ensure that IT policies boost output rather than erect needless obstacles. IT governance is still a bureaucratic process rather than a function that adds value in the absence of this alignment.

Inadequate examination of IT policies and procedures compromises organisational creativity, security, and effectiveness. The organisation must transition from passive compliance to active governance, where IT policies are continuously examined, improved, and matched with corporate

objectives, to close this gap. This calls for a culture of continual improvement, cross-departmental cooperation, and leadership commitment. The organization can make sure that its investments in technology promote long-term growth rather than just maintaining antiquated procedures by taking a more analytical and flexible approach to IT governance.

As elucidated by Khambule (2025), South Africa's socioeconomic development is greatly aided by State-Owned Entities (SOEs), which offer vital services in industries including logistics, telecommunications, electricity, and transportation. Ackers (2022) further adds that financial mismanagement, governance shortcomings, and operational inefficiencies are some of the ongoing issues that many of these organizations deal with. South Africa's state-owned enterprises (SOEs) need to adopt cutting-edge digital technology in a time when digital transformation is changing industries all over the world to improve service delivery, increase transparency, and guarantee sustainability. Digital technology and IT governance together offer a vital modernization path, however, putting it into practice is still hampered by structural and financial issues.

The findings of the present study show that although digital transformation has enormous promise for South Africa's state-owned enterprises (SOEs), its success depends on how well IT governance concepts are integrated. Mbele (2015) highlights that many SOEs are susceptible to disruptions as they continue to rely on old IT systems, have unclear governance frameworks, and battle cybersecurity threats. One important finding is that, as demonstrated by previous IT project failures in public sector organizations, technology adoption without adequate governance results in inefficiencies and elevated risks.

Uniform IT governance structures designed for South African state-owned entities is necessary. Structured approaches for IT administration can be provided by frameworks like COBIT and ITIL; however, their adoption necessitates organizational support and strong leadership commitment (Vutabwarova, 2018). The present study findings also emphasize how crucial regulatory compliance is, especially when it comes to cybersecurity and data protection. In addition to exposing SOEs to legal repercussions, non-compliance damages public confidence.

In addition to the above assertion, Mathase (2023) emphasizes that the integration of digital technology and IT governance offers both vast opportunities and difficult obstacles. The present study findings further show that although digital transformation can improve operational effectiveness, service quality, and transparency, strong IT governance frameworks are essential to its success. The inability of many South African state-owned enterprises (SOEs) to effectively utilize emerging technologies like Cloud computing, Artificial Intelligence (AI), and the Internet of Things (IoT) is caused by their old IT infrastructures and inattentive governance frameworks. Digital adoption is further complicated by challenges like cybersecurity threats, budgetary limitations, and change aversion.

Cloud computing, Artificial Intelligence (AI), and the Internet of Things (IoT) are just a few examples of the rapidly evolving digital technologies that have opened new avenues for creativity and efficiency. However, SOEs run a risk of mishandling new technologies in the absence of strong IT governance frameworks, which could result in misplaced investments, project failures, and cybersecurity vulnerabilities. IT governance makes sure that digital projects meet organisational goals, adhere to legal requirements, and successfully reduce risks. Although South African SOEs frequently lag in implementing these best practices, businesses throughout the world use frameworks like Control Objectives for Information and Related Technologies (COBIT), IT Infrastructure Library (ITIL), and ISO/IEC 38500 to assist IT decision-making (Nxozi and Flowerday, 2021).

Due to the close public monitoring of SOEs, a lack of proper IT governance implementation can result in monetary losses, harm to the organization's brand, and even political fallout. Further impeding progress are a lack of digital skills, financial limitations, and opposition to change. Notwithstanding these obstacles, a successful digital transformation of SOEs has the potential to boost government accountability, access to services, and economic growth. One of the many significant key finding is that, to minimize risks and guarantee that digital expenditures are in line with corporate objectives, efficient IT governance is essential. Although practice frameworks like Information Technology Infrastructure Library (ITIL) and Control Objectives for Information and Related Technologies (COBIT) might offer systematic methods to IT management, South African SOEs continue to execute them inconsistently.

Furthermore, the present study emphasizes how crucial stakeholder cooperation and leadership dedication are to advancing digital transformation. A lack of cooperation between business units and IT departments as well as isolated operations causes many SOEs to have misaligned strategies. To close these gaps, SOEs must take a comprehensive approach that ensures accountability and strategic alignment by integrating IT governance into corporate governance frameworks.

Lack of digital skills in SOEs is another important finding that hinders digital activities. This gap might be closed by funding worker upskilling and encouraging sound IT investments. Furthermore, fragmented digital initiatives are frequently the result of segregated operations and inadequate interdepartmental collaboration, underscoring the necessity of integrated governance models where business and IT goals are well matched.

The combination of digital technologies and IT governance in South Africa's state-owned enterprises (SOEs) is not only a technological development but also a strategic necessity for competitiveness and sustainability. To fully profit from digital transformation, SOEs need to give priority to:

- Strong IT governance structures to provide responsibility and risk control.
- To increase internal capacities, investments should be made in digital infrastructure and skill development.
- Cybersecurity and regulatory compliance strategies to protect systems and data.
- Coherent digital strategies are driven by stakeholder collaboration and leadership commitment.

6.3. Interpretation of Objective 2 Findings: To ensure that the information technology strategy of SOEs is closely aligned with the overarching objectives and priorities.

The findings provide an understanding of how evolving technologies affect State-Owned Entities' need for contemporary IT practices and strategy coherence. Findings pointed out that new technologies like Cloud computing, Artificial Intelligence, and data analytics have made it necessary to change to more integrated and flexible IT strategies. In addition to increasing operational effectiveness, these technologies force SOEs to take innovative measures to enhance performance. The effective execution of Project Synapse, an ICT strategy development program intended to synchronize IT capabilities with more general organizational goals, demonstrates how strong this alignment is in the organization.

Project Synapse has been essential in ensuring that IT procedures and infrastructure change are in step with the organization's strategic goals. Better decision-making and resource optimization have been made possible by this initiative's smooth integration of technology and business operations over the last two and a half years. Project Synapse's structured approach has made it possible for ongoing observation and modification, guaranteeing that IT expenditures yield the greatest possible return. The findings did, however, highlight the necessity of regular evaluations to ensure that the strategy stays current and adaptable to new trends, especially considering how quickly technology is changing.

6.3.1. Interpretation of Objective 2 Findings from elements of UTAUT, DOI and Upper Echelon theories.

Through the combined viewpoints of Upper Echelon, DOI, and UTAUT theories, the findings for Objective 2, which concentrated on the alignment of IT strategy with broader SOE objectives, are significantly explained. Upper Echelon Theory is crucial in this case because it shows that strategic alignment was a leadership-driven process rather than a technical one. Senior managers spearheaded the initiative and supported it because their strategic thinking and past experiences

enabled them to see IT as a strategic partner rather than a support function. From the perspective of Diffusion of Innovation (DOI), this alignment was presented as an innovation in and of itself, and its acceptance was contingent upon its suitability for the corporate priorities that had been set as well as its perceived relative benefit in accomplishing fundamental objectives such as financial sustainability and national service delivery.

The mechanism for execution is provided by UTAUT elements, which show that alignment is operationalized by making sure the IT strategy directly improved performance expectancy by enabling important business outcomes and decreased effort expectancy by simplifying integrated processes and was supported by social influences, specifically top management directives—thereby establishing the prerequisites for broad organizational buy-in and successful implementation.

6.3.2. Interpretation of Objective 2 Findings from IT governance and digital technologies frameworks

The findings demonstrate how crucial leadership dedication is to achieving effective IT strategy alignment. To obtain the required resources and promote an innovative culture, findings pointed out that executive buy-in was essential. In this instance, Project Synapse was executed smoothly thanks to strong leadership backing, which made sure that IT projects were in line with overall business aims rather than being isolated. Technology has been incorporated as a strategic enabler rather than merely a support function, thanks in large part to this top-down strategy.

Notwithstanding the advancements, the findings recognise the difficulties in preserving alignment in the face of changing legal and technical environments. The three main problems that require constant attention are cybersecurity threats, data privacy issues, and the need to develop digital skills. The organization's next evaluation of Project Synapse is essential to solve these issues and ensure that the ICT strategy is resilient and adaptable. Stakeholder input and industry best practices need to be incorporated into the review process to improve the strategy.

Overall, the finding indicates a consensus that new technologies are altering the IT requirements of SOEs, necessitating flexible and coordinated approaches. The organization has a solid basis thanks to Project Synapse, but to keep up with technological advancements, it is imperative that it continuously develops. SOEs can successfully use contemporary technology to promote operational excellence and sustainable growth by encouraging cooperation between IT and business units, making investments in workforce upskilling, and routinely re-evaluating strategic priorities. Other businesses going through comparable changes can use the lessons they learned from their experience as a useful benchmark.

Li et al., (2022) state that to optimize value creation, emerging technologies force SOEs to match their IT strategy with more general organizational objectives. IT investments that are strategically aligned serve business goals like boosting innovation, increasing transparency, and improving service delivery. For example, blockchain can improve accountability in procurement procedures, and AI-powered analytics can assist SOEs in allocating resources as efficiently as possible. Strong leadership, cross-departmental cooperation, and a clear digital transformation roadmap are necessary to achieve this alignment, though, and these are areas where many SOEs may find it difficult because of inflexible structures and outdated systems.

Adopting modern IT practices necessitates a cultural change in SOEs that promotes an attitude of constant learning and flexibility. To properly use new technology, staff members need to be upskilled, and leadership needs to encourage creativity and taking risks. Since resistance to new procedures can impede digital endeavors, change management becomes crucial. To supervise the implementation of technology and guarantee adherence to ethical and regulatory requirements, SOEs must also set up governance structures. In the absence of these structural and cultural changes, technology investments might not produce the desired results (Sabherwal, 2019).

From a strategic perspective, Zhou (2024) argues that by increasing operational effectiveness and service quality, emerging technologies allow SOEs to play a bigger part in the economic development of their countries from a strategic standpoint. Governments frequently depend on SOEs to provide vital public services and infrastructure, and contemporary IT systems can assist these businesses in meeting growing needs sustainably. For instance, AI-driven predictive

maintenance may minimize downtime in transportation networks, and IoT-powered smart grids can optimize energy distribution. To achieve these advantages, long-term planning, stakeholder involvement, and collaborations with IT companies in the private sector to close skill gaps are necessary.

SOEs must adopt a new culture that emphasizes innovation and agility in response to evolving technology. Traditional bureaucratic institutions may hinder rapid IT adoption; therefore, leadership must foster a digital-first mentality. To promote innovation, strategic alignment entails not just technology advancements but also organizational reorganization, hiring new employees, and forming public-private collaborations. SOEs are being forced by emerging technologies to update their IT processes and match them with long-term strategic goals. Innovation must be balanced with risk management, worker preparedness, and regulatory compliance for success. SOEs may improve service delivery, fortify governance, and continue to play a crucial role in the growth of their countries by embarking on the digital transformation journey comprehensively.

6.4. Interpretation of Objective 3 Findings: To foster a culture of innovation by leveraging information technology capabilities to explore new business opportunities, improve service delivery, and enhance performance capabilities.

The findings suggest that SOEs are aware of the importance of stakeholders in creating IT policies by making sure that new developments in technology complement corporate goals. Developing new and useful policies involves including important departments, such as operations, finance, and compliance, in discussions about IT governance. This cooperative strategy guarantees that IT policies tackle practical operational issues rather than merely theoretical ones, promoting a culture in which technology propels productivity and expansion. Using IT capabilities to promote innovation requires active leadership participation. They create an environment where digital transformation is given priority. The divisional operations managers on the IT Governance Committee offer valuable insights into process constraints, allowing IT to create customized solutions. By ensuring that IT investments directly support business needs, this cross-functional discussion strengthens a continuous improvement culture.

By using IT tools in their everyday work, staff members at all levels also support innovation. SharePoint has replaced outdated shared-file systems, enabling real-time collaborative document editing, which boosts productivity and reduces version control issues. User feedback is the driving force behind this change, demonstrating how stakeholder input results in useful IT improvements. Employees are empowered to take an active role in the innovation process when they are encouraged to propose and test new technology. By supplying industry best practices and compliance criteria, external stakeholders and regulatory organizations have an impact on IT guidelines. The company keeps abreast of new developments in automation, cloud computing, and artificial intelligence by interacting with technology partners. Achieving a balance between agility and risk management, regulatory input ensures that their IT rules stay compliant while simultaneously encouraging innovation.

A structured feedback process ensures the continuous integration of stakeholder input into IT strategy. Frequent meetings of the IT Governance Committee provide a forum for talking about difficulties, investigating new technologies, and assessing how they affect the company. By allowing for dynamic policy alterations through this iterative process, IT rules are guaranteed to change in tandem with organizational and technical advancements. Maintaining an innovative culture requires training and change management. Stakeholders must possess the necessary knowledge and skills to fully leverage modern IT systems such as SharePoint. By funding training and digital literacy initiatives, the SOE makes sure that staff members not only embrace new technology but also offer suggestions for enhancements.

6.4.1. Interpretation of Objective 3 Findings: Elements from UTAUT, DOI and Upper Echelon theories.

The findings of Objective 3, promoting an innovative culture, show a dynamic interaction between organizational leadership and technological potential that is best understood by combining the perspectives of Upper Echelon, DOI, and UTAUT. The strategic posture and risk tolerance of senior management, whose vision and approval are key drivers for committing resources to investigate new, IT-enabled business opportunities, are fundamentally necessary for cultivating an

innovative culture, according to Upper Echelon Theory. This is consistent with the Diffusion of Innovation theory and UTAUT's facilitating conditions. Management's support of new technologies helps to reduce perceptions of complexity and uncertainty, boosting the relative benefit of creative practices and promoting their trialability in pilot projects meant to enhance service production.

6.4.2. Interpretation of Objective 3 Findings from IT governance and digital technologies frameworks

The finding suggests that IT strategy accelerates digital transformation and reduces resistance to change. Constant improvement requires measuring the effects of IT initiatives pushed by stakeholders. Stakeholders evaluate whether IT standards effectively support innovation by monitoring measures like process efficiency, cost savings, and user happiness. Stakeholder feedback aids in strategy refinement, guaranteeing that technology adoption stays in line with corporate objectives. All parties involved, leadership, staff, and outside partners, must actively participate in promoting an innovative culture through IT. The SOE ensures that technology is not only a facilitator but also a driver of strategic growth by integrating collaborative decision-making into IT governance. In a constantly changing digital environment, this inclusive strategy preserves agility while bolstering IT capabilities.

The findings suggest that stakeholders are essential in creating IT policies and promoting innovation in businesses. These stakeholders include governmental organizations, business executives, IT departments, staff members, clients, and regulatory bodies. Together they create strong IT policies that support corporate goals and promote a culture of constant technological innovation. Their participation guarantees that IT plans are realistic, legal, and able to support sustained expansion.

Zhou (2024) emphasizes that through the establishment of cybersecurity laws, data protection rules, and digital transformation mandates, government and regulatory stakeholders provide the groundwork for IT norms. IT goals, such as cloud adoption, AI integration, or Blockchain

implementation, are frequently determined by government mandates in state-owned enterprises (SOEs). Malope et al. (2021) postulate that by offering financing for digital initiatives and explicit compliance criteria, stakeholders help firms innovate while reducing risks. To ensure that IT policies complement national security and economic objectives, their role is essential.

Finding show that integrating IT innovation into the organization's strategic goal is the responsibility of the board and corporate leadership. By assigning funds, approving IT modernization initiatives, and cultivating a culture that welcomes technological change, executives may make digital transformation a top priority. Under their direction, IT policies promote competitive performance, operational effectiveness, and business agility. Leaders who support innovation encourage staff to proactively adopt new technology through programs like hackathons and digital labs (Malatji, 2022).

Chief Technology Officer (CTO) and the IT department serve as the technical foundation for creating and executing IT policies. In addition to designing cybersecurity policies and ensuring the smooth integration of new systems with existing infrastructure, they evaluate emerging technology. Finding suggests that IT directors can adapt guidelines to corporate demands while preserving security and scalability by working with other stakeholders. Their knowledge is essential for converting corporate goals into workable IT plans, guaranteeing that innovation is both viable and sustainable (Munkhsaikhan, 2024).

Maqsood et al., (2024) suggests that to promote an innovative culture, employees and end users are crucial stakeholders as they gain important insights into inefficiencies and areas for improvement from their regular interactions with IT systems. Thus, to promote digital adoption, organizations must involve their workforce through innovation workshops, training initiatives, and feedback systems. Employees actively participate in the digital transformation of the company when given the freedom to try out new technologies like automation platforms or analytics driven by AI. By requesting improved digital experiences, clients and customers have an indirect impact on IT policies. Organizations must use IT capabilities to improve user interfaces, expedite service delivery, and customize consumer interactions in the highly competitive business environment of today. Customer feedback aids in the improvement of IT initiatives and guarantees that

investments in technology yield tangible benefits (Malope et al., 2021). Informed by the preceding interpretation of findings, the next section provides the framework for Information technology governance and digital technologies for performance capabilities in South African SOEs,

6.5 A framework for Information technology governance and digital technologies for performance capabilities in South African SOEs

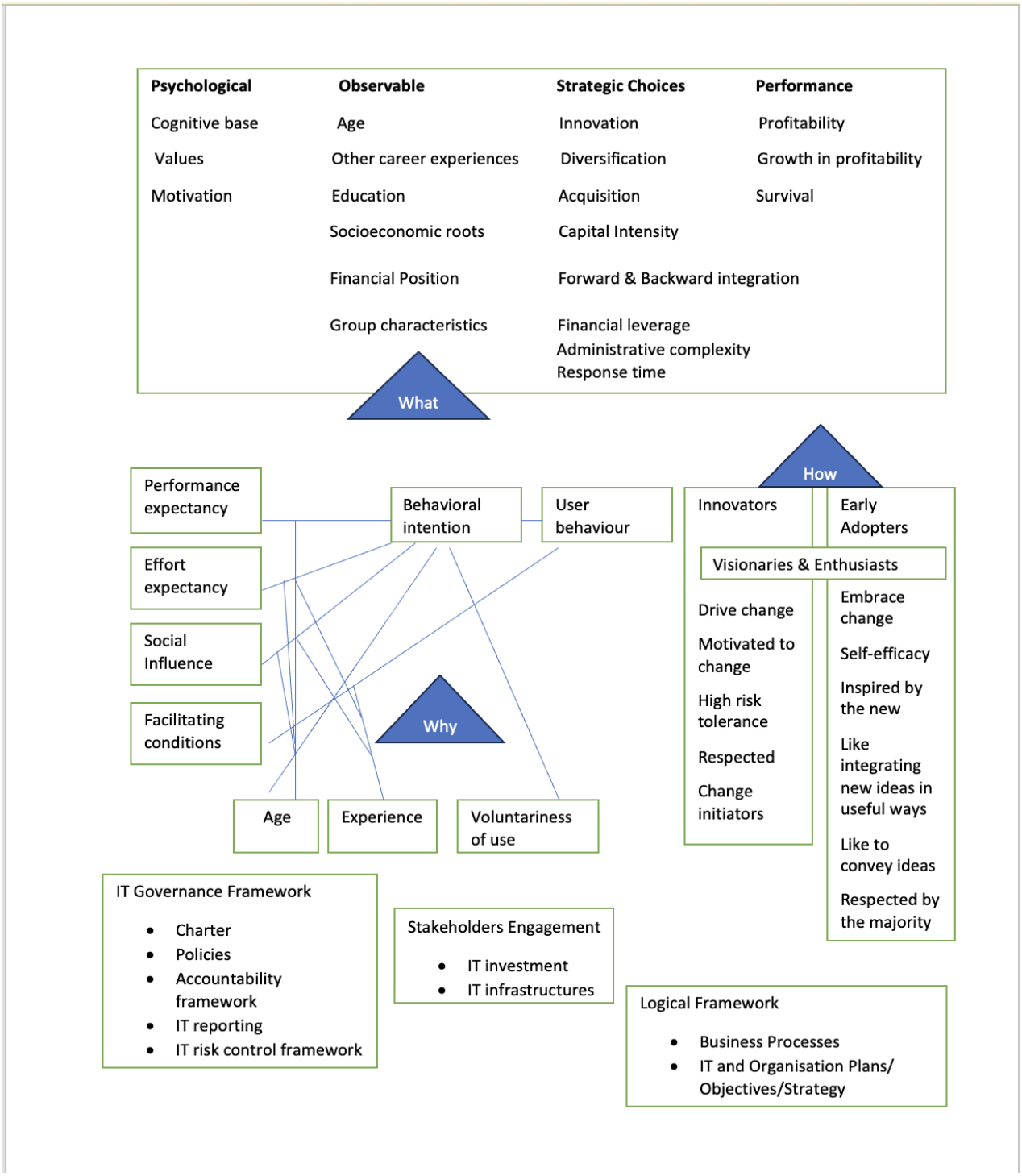


Figure 6.1 A framework for information technology governance and digital technologies for performance capabilities in South African SOEs

In the framework, core IT components are integrated into a performance-oriented IT and digital technologies governance in the context of South African SOEs as interconnected pillars under strategic direction rather than as discrete functions. The board and executive management ensure that all digital efforts are in line with the SOE's dual public-commercial mandate through IT strategy and leadership. The conceptualized framework operationalizes the strategy, controlling the integration of new cloud platforms and data analytics engines with legacy systems.

IT investment upholds the framework, which is supported by IT Policies & compliance methods that are adapted to South African requirements in order to justify expenditures and demonstrate value. The ability to safely experiment with developing technologies is provided by the Digital Innovation & Risk Management function. The framework turns IT from a support function into a controlled, strategic capacity that immediately improves performance, accountability, and public value by tying these components together with transparent responsibility.

One of the present study findings is the proactive evaluation of how new technologies alter and reinterpret the necessity of contemporary IT practices. The ability to see ahead and assess the precise effects of technological advancements like artificial intelligence (AI), blockchain, and advanced data analytics on existing systems and governance frameworks is necessary for this. The emphasis is on carrying out impact evaluations that convert the potential of new technologies into specific needs for updated process flows, new skill sets, and updated governance frameworks. This way, the organisation's IT backbone will develop in tandem with the evolution of technology.

The crucial task of ensuring a profound strategic alignment between IT capabilities and the state-owned enterprise's overarching business objectives is at the heart of this reform. This entails aggressively managing IT as a key strategic partner rather than as a support role. Important responsibilities include converting business strategy into a well-defined technology roadmap and, on the other hand, illustrating how new IT capabilities can reduce enterprise-level risks or open up strategic opportunities. This two-way alignment guarantees that investments in technology will directly support mission-critical objectives and enhance public value.

Lastly, the conceptualized framework underlines the critical activity of engaging a broad variety of stakeholders in both the establishment of IT guidelines and the fostering of a creative culture. This entails creating organised channels for communication and cooperation between business units, end users, IT leadership, and outside partners. SOEs can jointly develop effective and widely accepted guidelines by utilizing a variety of viewpoints. Additionally, enabling these stakeholders to test and advocate for novel technological applications fosters a bottom-up innovation culture that enables the organization's IT capabilities to reach their full potential.

6.6. Summary of the chapter

To systematically guide investments in cloud, data analytics, and other digital platforms, this chapter has conceptualized a performance-focused governance framework for South African SOEs by integrating strategic alignment, risk management, resource optimization, and performance measurement all essential components of IT governance.

This chapter emphasized the importance of effective IT governance frameworks integrated with digital technologies to improve performance capabilities, reducing risks and ensuring digital spending is in line with business goals. South African state-owned entities frequently encounter institutional obstacles that impede coherent IT governance and digital technologies, such as bureaucratic delays, reliance on outdated systems, and shift aversion. Without uniform execution, IT projects stay fragmented, resulting in redundant work and resource waste. SOEs must prioritize governance maturity to close these gaps. This may be done by creating clear accountability procedures, investing in training, and encouraging a CEO buy-in. Enhancing IT governance would guarantee that technology expenditures directly promote long-term organizational and national development goals in addition to improving operational efficiency.

CHAPTER 7: EVALUATION OF RESEARCH AND THE THESIS CONTRIBUTIONS

7.1. Introduction

This chapter evaluates the present study journey by articulating practical recommendations, thesis contributions, and potential future research.

Research Journey

Chapter 1 introduced the study by giving the motivation and background to the research problem. **Chapters 2 and 3** concentrated on the convergence of Information Technology (IT) Governance and Digital technologies to enhance performance capabilities in State-Owned Entities. **Chapter 4** described the research methodology followed in conducting the present study. Subsequently, **Chapter 5** analyzed the collected data and discussed the findings. **Chapter 6** interpreted the findings as well as conceptualizing the framework that achieves the goal of the present study. Finally, **Chapter 7** articulates practical recommendations, thesis contributions, and potential future research. The thesis is then concluded.

7.2. Summary of Findings

State-owned entities (SOEs) must prioritise strategic alignment as the foundation of effective IT governance, ensuring that each technology investment is properly linked to overarching organizational objectives. This method optimizes resource allocation and leverages the confluence of digital technology and governance frameworks, providing a disruptive avenue to improve operational performance. By integrating governance mechanisms that harmonize the conflict between operational stability and innovation, state-owned entites can develop new capabilities that are resilient and adaptive, transforming IT governance into a driver of sustained value creation instead of a compliance obligation.

This study provides essential insights into the dynamic design of governance structures that balance control and flexibility, allowing state-owned entities to adapt to rapid technological advancements. State-owned entities are encouraged to view IT governance not as a constrictive framework, but as a facilitator of strategic agility and ongoing development. This viewpoint enables state-owned entities to proactively address emerging possibilities, cultivating a culture of continuous enhancement while preserving fundamental corporate integrity. As digital disruption escalates, the results highlight that exemplary governance is rooted not in inflexibility, but in the ability to harmonize technology, strategy, and innovation together for sustained competitive advantage.

7.3. Thesis contributions

This thesis contributes in several ways to the theoretical, contextual, methodological, and practical spheres. Practical contribution offers managers and policymakers a workable roadmap to improve operational performance, encourage innovation, and guarantee that IT investments directly support corporate and national objectives by providing a validated framework of IT governance guidelines and strategic alignment practices designed especially for State-Owned Entities (SOEs). Theoretically, it makes a substantial contribution by combining three different lenses the Upper Echelon Theory, Diffusion of Innovation (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT) into a new, coherent analytical model that explains not only how technological adoption takes place within the particular, frequently politically influenced context of SOEs, but also why it is started, showing how executive cognition propels the strategic integration of IT.

In terms of methodology, the study provides a strong example of a qualitative case study design, using semi-structured interviews and strict purposive sampling of elite participants to produce rich, contextually deep insights into intricate organizational phenomena. This serves as a comprehensive guide for future research aiming to examine high-level strategic decision-making in comparable contexts. From a conceptual standpoint, the thesis reinterprets IT governance and digital technologies to enhance performance capabilities in SOEs as a dynamic, leadership-orchestrated

strategic capability that is essential to fostering cultural change, investigating novel business models, and gaining a sustained competitive edge in the public sector, rather than just as a technical compliance function.

7.3.1. Practical Contribution

Improving organizational performance, especially in State-Owned Entities (SOEs), requires efficient resource allocation and utilisation in IT services. The study's conclusion indicates that several key success factors are crucial for maximising IT resources. First, IT investments directly support organisational goals by decreasing waste and maximising value when IT and business objectives are strategically aligned. By offering organised methods for managing IT resources, governance frameworks can help achieve this alignment. Furthermore, setting priorities for IT projects, obtaining funds, and cultivating an efficient and accountable culture all depend heavily on good leadership and executive backing.

Data-driven decision-making, in which performance measurements and analytics direct the distribution of resources, is another important component. By putting in place reliable IT performance assessment solutions, businesses may monitor utilisation rates, identify inefficiencies, and make dynamic resource reallocations. Additionally, firms can adjust to shifting needs thanks to flexible and scalable IT infrastructure, which keeps resources from being overworked or misused. Technologies like automation, virtualization, and cloud computing are crucial for increasing the adaptability and economy of IT operations.

Another important factor that determines success is workforce competency. Putting money into ongoing IT skill development ensures that staff members can efficiently handle and use existing resources. IT teams can retain a high level of expertise by using knowledge-sharing platforms, certifications, and training programs. Additionally, cooperation between IT and other business divisions prevents silos and redundancies by fostering a common knowledge of resource requirements. Better priority assessment by cross-functional teams results in more informed and equitable resource allocation.

South African SOEs should implement continuous improvement techniques and periodically review and enhance IT governance policies to maintain optimal use of IT resources. Gaps and areas for improvement can be found by benchmarking against industry best practices and doing routine audits. Finally, encouraging innovation and digital transformation projects ensures that IT resources are prepared for the future and compatible with cutting-edge technologies like blockchain, AI, and IoT. In an increasingly digitalised economy, SOEs can attain increased efficiency, cost savings, and long-term competitiveness by incorporating five crucial success elements.

7.3.2. Theoretical contribution

This present study has offered a multifaceted understanding of the dynamics influencing governance and information technology in State-Owned Entities (SOEs), strategically guided by the convergent lenses of the Unified Theory of Acceptance and Use of Technology (UTAUT), the Diffusion of Innovations (DOI), and the Upper Echelon Theory (UET). With UET emphasizing the critical role of leadership, DOI outlining the technological integration process, and UTAUT elucidating the factors influencing user adoption, the combination of these frameworks has proven to be extremely beneficial. When combined, they provide a strong analytical framework for dissecting the intricate interactions between strategy, innovation, and human factors in the setting of the public sector.

Strategic and operational decision-making are greatly improved by effective IT governance frameworks, which offer data-driven insights, well-defined accountability, and organised procedures. Decision-makers are guaranteed access to precise, timely, and pertinent information by governance frameworks like COBIT, ITIL, and ISO/IEC 38500, which match IT investments with business goals. In addition to lowering uncertainty and risks, this alignment guarantees that IT resources are directed toward projects that have the most potential to benefit the company. IT governance helps leadership to prioritise long-term growth-promoting digital transformation

projects at the strategic level. At the operational level, it improves service delivery, streamlines processes, and increases response to changing market conditions.

7.3.3. Methodological contribution

This present study being an interpretive case study based, triangulating the intricately intertwined elements of IT Governance, Digital Technologies, and Performance Capabilities within a State-Owned Entity (SOE), is its methodological contribution. The study used in-depth interviews and documentary analysis to capture the rich, contextual narratives of practitioners, departing from the quantitative, survey-based approaches that predominated in the information systems research field. These methods frequently isolate variables and look for generalizable connections.

By elucidating the lived processes through which governance structures are implemented (or circumvented) to guide digital initiatives, this methodology revealed the underlying "how" and "what" behind the phenomenon. The present study describes how upper echelons ultimately interpret these processes as improved (or diminished) performance capabilities. As a result, the study also offers a reproducible methodological framework for producing the detailed descriptions required to comprehend similar occurrences in other intricate public-sector contexts where official regulations and actual practice frequently differ.

7.3.4. Contextual contribution

The contextual contribution sheds light on the complementary interactions among IT governance, digital technologies, and performance capabilities in the distinct and little-studied context of a State-Owned Entity (SOE) in South Africa. Three theoretical frameworks serve as the theoretical foundation for this synergy: the Diffusion of Innovation (DOI) Theory explains the adoption of digital technologies by contextualizing how technologies are viewed and absorbed in the context of the SOE's unique resource limitations and governmental directives. The Unified Theory of Acceptance and Use of Technology (UTAUT) then shows how the SOE's particular facilitating conditions or lack thereof and social influences among staff determine successful implementation,

thereby framing how IT Governance, both formal and informal, directly influences the actual utilization of these technologies.

By claiming that the strategic decisions and experiences of the SOE's leadership, which are influenced by the country's socioeconomic pressures and the entity's dual commercial-public mandate, are the crucial filter that orchestrates these elements to achieve contextually relevant performance outcomes, the Upper Echelon Theory contextualizes how this governed technological use is translated into enhanced Performance Capabilities. This goes beyond generic models to provide a framework that is deeply ingrained in the reality of the South African public sector.

7.4. Study Limitations

Despite providing valuable insights into the connection between SOE performance and IT governance and digital technologies, this study is limited by several significant limitations. The findings are based on a case study of a single SOE, which allowed for a thorough, context-specific analysis. However,

- Due to the distinct regulatory, cultural, and structural environment of this one organization, the results may not be directly applicable to other SOEs in different sectors.
- Additionally, to capture the decision-maker perspective, the participant scope was purposefully limited to managers and senior managers, leaving out the perspectives of technical staff, operational employees, and board members. These perspectives could have offered a more comprehensive understanding of the implementation of IT governance and its ripple effects throughout the organizational hierarchy.

The methodological approach and associated biases are further limitations. The study's cross-sectional design offers a useful moment in time, but it is unable to capture the long-term impacts and changing dynamics of how IT governance initiatives affect performance over several years. Furthermore, using self-reported information from interviews raises the possibility of social

desirability bias and retrospective sense-making, in which individuals may exaggerate favorable results or defend previous choices rather than giving a completely impartial assessment.

7.5. Recommendations for future studies

Several specific research recommendations can be made to support and expand on the current findings, building directly upon the study's recognized shortcomings. To further corroborate these present study findings, future studies could comparatively analysis the phenomenon across various industries. The present study was a single case study with various case units, thus, future studies could adopt a multiple-case study design involving SOEs from different industrial sectors and national contexts to address the problem of limited generalizability. This would enable cross-comparative analysis and assist in differentiating between context-specific and universally applicable IT governance principles. To address the limited scope of participants and offer a more thorough perspective, a mixed-method approach is advised, which would include distributing extensive surveys to technical and operational staff to measure the perceived efficacy of IT governance frameworks from various organizational levels in addition to conducting interviews with decision-makers.

A longitudinal study that tracks the same SOE over three to five years is recommended to overcome the limitations of the cross-sectional design and reliance on self-reported data. Additionally, interview data should be triangulated with hard performance metrics, such as financial reports, project success rates, and key performance indicators (KPIs), to objectively correlate IT governance and digital technologies maturity with measurable performance outcomes and go beyond mere perceptual measures.

7.6. Thesis conclusion

This thesis demonstrates that there is a complex, context-dependent synergy rather than a straightforward, linear development between IT governance, digital technologies, and

performance capabilities. The present study showed that digital technologies by itself cannot improve performance; that is, in the absence of a strong and flexible governance structure, it frequently results in investments that are siloed, increased risk, and unrealized promise. The inflexible, compliance-driven IT governance may hinder the flexibility and creativity that digital technologies offer. IT governance must transform from a control-oriented role into an enabling structure that strategically coordinates digital adoption for performance capabilities to be fully realized. To turn technological potential into real operational, strategic, and competitive advantages, governance mechanisms must be both flexible enough to keep up with the rate of technological change and structured enough to ensure alignment with the organization's core strategic objectives.

By placing the synergy within the context of a State-Owned Entity (SOE), this thesis provides an original contribution by arguing that a "one-size-fits-all" governance paradigm is inherently insufficient. The implementation of IT governance, the adoption and use of digital technologies, and performance capabilities are all significantly influenced by the socioeconomic demands, political pressures, and legacy systems that typically manifest in SOEs. The original contribution of the thesis is a contextualized IT governance and digital technologies framework to enhance performance capabilities in South African SOE complex environment. This framework may give SOEs a crucial road map for successfully navigating their digital transformations, ensuring that technology investments are not just expenses but rather strategically managed levers for attaining consistent and pertinent performance in a changing world.

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