

**SIMON DIEDONG DOMBO UNIVERSITY OF BUSINESS AND
INTEGRATED DEVELOPMENT STUDIES**

**PROMOTING ACCOUNTABILITY, GOVERNMENT EFFECTIVENESS,
AND CONTROLLING CORRUPTION IN THE PUBLIC SECTOR
GLOBALLY: DO THE INTERACTIVE EFFECTS OF ICTs MATTER?**

DOGBE FRANCIS

2024

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BY

DOGBE FRANCIS

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**A THESIS SUBMITTED TO THE DEPARTMENT OF ACCOUNTING,
SCHOOL OF BUSINESS, SD DOMBO UNIVERSITY OF BUSINESS
AND INTEGRATED DEVELOPMENT STUDIES, WA, GHANA,
IN PARTIAL FULFILMENT FOR THE AWARD OF A
MASTER OF PHILOSOPHY IN ACCOUNTING**

NOVEMBER, 2024

DECLARATION

To the best of my knowledge, no portion of this dissertation has been submitted for the award of a degree at the university or in a different institution, except for the papers cited. It is also my original work and the conclusions are the outcome of independent research. Therefore, I take complete ownership of everything in this dissertation.

Signature: **Date:**

DOGBE FRANCIS

Supervisor

I at this moment attest that the supervision of this thesis followed the guidelines established by the University.

Signature: **Date:**

MR MUFTAW DZANG ALHASSAN

(SUPERVISOR)

DEDICATION

I dedicate this research to my lovely mother Agnes Dogbe and my late sister Edinam Dogbe.

ACKNOWLEDGMENTS

I firstly give Almighty God praise for His favour, love, and protection throughout this work. I would especially want to express my gratitude to Mr. Muftawu Dzang Alhassan my supervisor, for his tireless efforts in supervising this dissertation from the planning stages of the study proposal to the end. I am very grateful for his guidance on various professional matters and research approaches to be precise research software used during the project. God bless you very much.

I also give special thanks to Dr. Ezekiel Davies for his efforts, advice, and inspiration. I would have not progressed this far without you. God bless you abundantly. My appreciation to Dr Bernard Bawuah, Dr Andrews Osei Agyemang, Apostle Robert Peidam Kuzuri, my parent, my brothers and sisters and all my lecturers. I cannot repay you all for what you have done in my life. God richly bless you all!!!

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AVE	Average Variance Extracted
B2B	Business to Business
BI	Business Intelligence
CB-SEM	Covariance Based-Structural Equation Modelling
CRM	Customer Relationship Management
CSR	Corporate Social Responsibility
DOI	Diffusion of Innovations
EDM	Electronic Document Management
ERP	Enterprise Resource Planning
ESG	Environmental, Social, and Governance
FDA	Food and Drug Administration
GDP	Gross Domestic Product
GICTU	Government Information and Communication Technology Use
GOF	Goodness of Fit
HR	Human Resources
HRIS	Human Resource Information Systems
ICT	Information and Communication Technology
ICTA	Information and Communication Technology Access

IICTU	Individual Information and Communication Technology Use
IMF	International Monetary Fund
IoT	Internet of Things
M-health	Mobile Health
NGO	Non-Governmental Organization
PLS-SEM	Partial Least Squares Structural Equation Modeling
PSP	Public Sector Performance
SEM	Structural Equation Modelling
SME	Small and Medium-sized Enterprise

ABSTRACT

The effectiveness, efficiency, and influence of government programmes and services in various nations and areas are all included in the public sector performance. Public sectors around the world have been affected by negative issues such as corruption, and a lack of accountability. In recent years, governments and individuals have been increasingly utilizing information and communication technologies (ICTs) to ensure Government effectiveness and accountability and combat corruption in the public sector. This study investigates the role of ICTs in promoting public sector performance at the global level.

Despite the numerous benefits of ICTs in enhancing public sector performance, there exists a dearth of literature on ICTs and public sector performance. Extant research on ICTs and public sector performance has largely focused on private firms where they measured performance mainly based on profitability levels, making it difficult to generalize such findings to the public sector that measures performance based on increased, Government effectiveness, accountability and a reduction in corruption. With high levels of corruption in public institutions, it has become important to investigate how the adoption of ICTs influences public sector performance. Besides, these past studies offered a narrow view of ICTs and public sector performance as they have largely relying on data from single countries. Apart from that these studies were conducted in the developed country context thus limiting their findings to such contexts. This study examines this relationship at the global level where findings can be easily generalized to cover the global context. The study adopted secondary data from 131 countries globally. To fill these gaps, the study leans on the foundation of accountability theory and a quantitative survey approach as a methodological lens to investigate the effects of ICTs on promoting public sector performance.

By analyzing data in SmartPLS, the results indicate that Government ICT Use and ICT Access were found to significantly influence public sector performance. ICT Access was found to significantly influence Government and Individual ICT Use. Furthermore, the study investigates the mediating role of Government and Individual ICT Use on the impact of ICT Access on Public Sector Performance. The mediating role of Government ICT Use on the impact of ICT Access was found to positively influence public sector performance. Findings suggest that creating a favorable ICT environment will positively influence government and individuals to use ICTs which will promote public sector performance as a means of promoting accountability, government effectiveness and controlling corruption in the public sector. Finally, the study recommends future studies should utilize primary data collection techniques in their research to better possess some degree of control over the constructs of their stud

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The effectiveness, efficiency, and influence of government programmes and services in various nations and areas are all included in the public sector's performance (Cinar, Demircioglu, Acik, & Simms, 2024). The public sector is essential to modern government because it shapes socio-economic development and ensures public welfare (Alsharari & Daniels, 2024). However, public sectors around the world have been affected by negative issues such as corruption, a lack of government effectiveness, and accountability (Lauwo, Azure, & Hopper, 2022). In recent years, governments and individuals have been increasingly utilizing information and communication technologies (ICTs) to ensure Government effectiveness and accountability and combat corruption in the public sector (Makubi & Issa, 2022). Government effectiveness is a component of good governance, which makes sure that the decisions made by public servants are clear and accessible to the general public (Ponti, Cerrillo-i-Martínez, & Di Mascio, 2022). ICTs provide a variety of avenues for information dissemination, allowing governments and individuals to improve Government effectiveness in public sector activities (Ofori, Appiah-Nimo, & Boachie-Mensah, 2023). Governments and individuals can use ICT platforms, for example, to process employee payroll, prepare invoices, preparation of financial reports, publishing procurement contracts, performance reports, and budgets which enhance accountability, Government effectiveness, and control corruption in the public sector (Styrin, Mossberger, & Zhulin, 2022). This makes it possible for the public to examine government spending and hold officials responsible for their actions (Li, Wang, & Zhang, 2024). Governments and individuals can now disclose datasets in machine-readable formats due to the

introduction of open data initiatives made possible by ICTs, which promotes greater Government effectiveness and accountability to make data-driven decision-making easier (Sampaio, Andrade, Bernardini, & Viterbo, 2022).

A fundamental principle of governance and organisational management is accountability, which is the duty of individuals and organisations to account for their deeds, choices, and output (Abhayawansa, Adams, & Neesham, 2021). ICTs have enabled reporting platforms using improving public sector accounting procedures' leading to government effectiveness, and accountability, controlling corruption and providing easy public access to financial data (AbdulKareem et al., 2024). Accountability enables the government and individuals to be responsible for their financial decisions, and use of public funds (Koskimies & Kinder, 2024). Accountability entails taking responsibility for one's activities and being liable to all parties involved, including shareholders, consumers, government agencies, and people (Poursoleyman, Mansourfar, Hassan, & Homyoun, 2024). ICTs are essential for enhancing accountability because they make real-time feedback, assessment, and monitoring possible (Bibri, Krogstie, Kaboli, & Alahi, 2024). ICT-enabled platforms, like citizen engagement platforms and e-governance portals, allow citizens to submit complaints, offer input on public services, and take part in decision-making (Cheshmehzangi, 2022). These platforms not only enable citizens but also provide opportunities for government and individual accountability and responsiveness since public servants are forced to address the concerns raised by the public quickly (Eom & Lee, 2022). Governments and individuals can use ICTs to put in place immediate financial monitoring systems that keep tabs on budgetary allocations, revenues, and expenditures (Usman, Esomchi, Nasiru, & Daniel, 2024). These systems give oversight authorities and decision-makers the most recent data on financial transactions,

empowering them to identify irregularities, resolve differences, and take prompt corrective action (Sarker, Janicke, Ferrag, & Abuadbbba, 2024). Accountability is improved through real-time financial monitoring, which makes sure that public bodies are held responsible for their financial decisions and actions (Pavone, Ricci, & Calogero, 2024). Information and communication technologies (ICTs) offer means for greater oversight, real-time monitoring, and transparent reporting, all of which contribute significantly to the improvement of public sector performance (Camngca, Amoah, & Ayesu-Koranteng, 2024). Access and use of ICTs by government and individuals make it possible to confirm the authenticity and reliability of financial documents and transactions through the use of digital signatures and authentication techniques. Digital signatures offer an impenetrable and safe way to sign electronic papers, guaranteeing that financial records are not changed or tampered with without permission. Biometric verification and two-factor authentication are examples of authentication technologies that improve transaction security and stop illegal access to sensitive financial information (Al Hemairy, Abu Talib, Khalil, Zulfiqar, & Mohamed, 2024).

Public sector performance typically improves when there is a strong sense of accountability, Government effectiveness and a reduction in corruption within the public sector because officials are held to high standards for professionalism and moral behaviour (Ayentimi, 2022). Accountability and government effectiveness may result in improved resource management, more successful policy execution, and higher levels of public trust. Thus, public sector performance typically suffers when there are insufficient accountability systems, little government effectiveness and widespread corruption (Ackim, Rugeiyamu, & Msendo, 2024). On the other hand, enhanced public sector performance can be attributed to robust accountability frameworks, Government

effectiveness procedures, and successful anti-corruption initiatives (Okpara & Mamman-Muhammad, 2022). Despite the huge potential of ICTs in promoting public sector performance specifically in relating to promoting accountability, Government effectiveness and controlling corruption, the literature reviewed indicates that the focus of extant research on ICTs and public sector performance has largely focused on private firms where they measured performance mainly based on profitability levels Siddiqui (2019); Siddiquee & Zafarullah (2022); Koellinger (2008); Cataldo, Pino et al. (2020); Ghazinoory and Hashemi (2023).

By automating operations that are susceptible to corruption and providing technology that enhances government effectiveness, access and use of ICTs provide creative solutions to fight corruption (Mahuwi & Israel, 2024). For example, electronic processing of payroll and invoicing solutions, improve government effectiveness by offering a digital record of transactions, expedite the payroll process, and reduce the possibility of bribery and corruption. In the same way, blockchain technology has shown great promise in the fight against corruption by guaranteeing the immutability and transparency of transaction records, which lowers the possibility of fraud and manipulation in sectors including financial transactions, land registries, and public procurement (Kshetri, 2021).

1.2 Research Problem

The adoption and use of ICTs in the public sector is gradually increasing government effectiveness, accountability and controlling of corruption which is significantly promoting public sector performance in both developed and developing economies (Makubi & Issa, 2022). However, despite the numerous benefits of ICTs in enhancing public sector performance, there exists a dearth of literature on ICTs and public sector performance. Extant research on ICTs and public sector performance has largely

focused on private firms where they measured performance mainly based on profitability levels, making it difficult to generalize such findings to the public sector that measures performance based on increased government effectiveness, accountability and a reduction in corruption (Siddiqui 2019; Siddiquee & Zafarullah 2022; Koellinger 2008; Cataldo, Pino et al. 2020; Ghazinoory and Hashemi 2023). With high levels of corruption in public institutions (Siddiqui, 2019; Siddiquee & Zafarullah, 2022), it becomes important to investigate how the adoption of ICTs influence public sector performance.

Also, these past studies present a narrow view of ICTs and public sector performance as they have largely relied on data from single countries and were conducted in the developed country context thus limiting their findings to such contexts (Alhassan, Adam, Musah, & Wahaga, 2021; Mallick, 2021). This, therefore, calls for the research to examine this relationship at the global level where findings can be easily generalized to cover the global context. Considerable research on ICTs and public sector performance particularly on Government effectiveness, accountability and controlling of corruption has concentrated on the developed world where attributes such as technological infrastructure, legislation, culture, and literacy levels differ from developing countries (eg. Ghana) Ponti et al. (2022); Adam & Fazekas, (2021). Hence, the findings from these studies cannot be generalized to a global context. Therefore, there is a need for future studies to be carried out at a global level.

Lastly, studies focusing ICTs and public sector performance have mostly adopted theories that include the Digital governance theory (Madan & Ashok, 2023; Boustani & Chedrawi, 2019); Aleisa, 2024), Institutional theory (Madan & Ashok, 2023; Ramirez-Madrid, Escobar-Sierra, Lans-Vargas, & Montes Hincapie, 2024); Price, Suhomlinova, & Green, 2024; AbdulKareem et al., 2024) and resource base view

(Madan & Ashok, 2023; Ramirez-Madrid, Escobar-Sierra, Lans-Vargas, & Montes Hincapie, 2024); Price, Suhomlinova, & Green, 2024; AbdulKareem et al., 2024). Although the relevance of these theories in the accounting domain cannot be underplayed, some researchers have criticized these theories (Digital governance theory) there is a gap between those who have access to digital technologies and those who do not (Refat, Patwary, & Rahman, 2023); (Febriyanti, Widianingsih, Sumaryana, & Buchari, 2023). Some researchers argue that digital governance theory tends to place too much emphasis on technological solutions rather than addressing broader organizational and strategic issues. This overemphasis on technology may lead to neglecting critical aspects such as organizational culture, leadership, and change management, which are essential for successful digital transformation in accounting (Kindström, Carlborg, & Nord, 2024; Neumann, Guirguis, & Steiner, 2024; Bertello, De Bernardi, & Ricciardi, 2024; Wiessner, Giuliani, Wijen, & Doh, 2024). In many cases, marginalized communities or regions may lack the infrastructure or resources to fully participate in digital governance initiatives. This can exacerbate existing inequalities and limit the effectiveness of digital government and accountability measures (Hai and Kazmi, 2015; Lim, Osman, Salahuddin, Romle, and Abdullah, 2016). Also, some researchers have criticized this theory (Institutional theory) tends to portray institutions and organizational structures as static and resistant to change. Researchers argue that this perspective may overlook the dynamic nature of organizations, especially in rapidly evolving industries like accounting where technological advancements and regulatory changes frequently necessitate organizational adaptation (Eitrem, Meidell, & Modell, 2024; Liu, Liu, Gao, Yu, & Pu, 2024). The theory's focus on institutional stability may downplay the importance of proactive change management and innovation in accounting practices Therefore, the

researcher proposes more convincing theories should be considered. Hence, this study leans on the foundations of the accountability theory

1.3 Research Purpose

Concerning the gaps identified in the literature regarding ICTs and public sector performance, this study aims to investigate the role of ICTs in promoting public sector performance at the global level.

1.4 Research Objectives

- a. To examine the effects of ICT access on individuals and government use of ICTs.
- b. To investigate the impact of individual and government ICT use on public sector performance.
- c. To investigate the mediating role of individual and government ICT use on the impact of ICT access on public sector performance.

1.5 Research Questions

- a. What is the effect of ICT access on individuals and government use of ICTs?
- b. What is the impact of individual and government ICT use on public sector performance?
- c. What is the mediating role of individual and government ICT use on the impact of ICT access on public sector performance?

1.6 Significance of the Study

There are three ways to communicate the significance of this study. That is research, practice, and policy. Concerning research, this study was carried out to investigate the role of ICTs in promoting public sector performance by enhancing accountability, Government effectiveness, and controlling corruption in the public sector. This has

largely been ignored by previous research. Similarly, the mediating effect of variables such as Government and individual use of ICT on the relationship between ICT access and public sector performance has largely been ignored by previous research. Arguably, this is the first study carried out on the nexus between ICTs and public sector performance. The study's reliance on archival sources of data enables the easy reproducibility and generalizability of findings from this study to the larger population. This study, therefore, adds to the limited literature in the area of ICTs and public sector performance.

To practice, the study will show how ICTs promote public sector performance. The study can guide the formulation and revision of policies related to the access and use of ICTs in the public sector. Policymakers can identify gaps, challenges, and opportunities that may arise in the context of implementing ICT-driven initiatives to promote accountability, government effectiveness and control of corruption in the public sector.

To policy, creating a favourable ICT environment will influence the government and individuals to have access to it. An enabling ICT environment in the form of ICT access and infrastructure will equip government and individuals to promote accountability, government effectiveness and controlling of corruption which will enhance public sector performance. Similarly, an enabling environment in the form of ICT legislation and policy will ensure that government and individual financial information is protected and secured. Thus, this study will provide policymakers, especially the government sectors, a clear insight into the effect of ICTs on promoting accountability, government effectiveness and controlling corruption.

1.7 Chapter Outline

There are five chapters in the thesis. The remaining chapters, save this one, are outlined as follows: The second chapter reviews the literature on ICT innovations, challenges, and conceptual approaches to ICTs. It also discusses research gaps and future directions, public sector performance, accountability, government effectiveness, and combating corruption. Additionally, this chapter offers a rationale for the model used in this investigation, drawing from the evaluated literature. The third chapter discusses the study's approach. It lays out a number of phases, including the data analysis method, research methodology, and research paradigm.

The study's analysis and discussion are covered in Chapter 4. First, by making sure the conventional choice criteria are applied, the measurement model is assessed for indicator reliability, internal consistency for reliability, convergent validity, and discriminant validity.

In addition, an evaluation of the structural model's goodness of fit, multicollinearity statistics, hypothesis testing results—including bootstrapping direct effect—and the impact of government and individual ICT use on mediating the relationship between the independent and dependent constructs are also investigated. This chapter also covers the conclusions drawn from the findings' analysis. Ultimately, this chapter contains the discussion of the results. The relationship between the model's endogenous and exogenous variables serves as the foundation for these talks, which are then followed by conversations to examine how moderators like the government and individual ICT use affect the exogenous variables. The final part, chapter five, provides a summary of the study's goals and purpose as well as its key discoveries and conclusions. Furthermore, it conveys the directions for future research as well as the ramifications of the study that was done.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

As was covered in Chapter One, the goal of this research is to find out how ICTs might improve public sector performance on a worldwide scale. Five topics are covered in this chapter. A survey of pertinent literature on information and communication technologies, ICT access, and ICT use by individuals and governments is included in the first section. A review of public sector performance, public sector government effectiveness, public sector accountability, and public sector corruption control are included in the second section. The literature on information and communication technologies and public sector performance was further evaluated in the third section. A review of the conceptual and methodological frameworks that earlier scholars had relied upon constituted the fourth section. Digital developments in the public sector are deduced in the fifth section. In addition, the literature on geographic issues in public sector research is reviewed in the fifth section. The last section pointed up flaws in the frameworks, techniques, and issues review in order to support the necessity of this investigation. The research hypothesis, the research model, and the prevalent theoretical methodologies used in the investigation of ICTs and public sector performance are also presented in this chapter. Furthermore, as the study sought to advance accountability, improve the efficacy of government, and reduce corruption in the public sector, it became clear from its theoretical perspective that Michael Power's accountability theory from the early 1990s was relevant for this investigation. A summary of some reviews of the literature in this area may be found in Table 2.1.

2.2 Information and Communication Technologies

Information and Communication Technologies (ICT) refer to a broad range of technologies used for the acquisition, storage, processing, and dissemination of information (Moreno et al., 2024). These technologies encompass both hardware and software components, along with the networks and infrastructure necessary for communication and data exchange (Sharma et al., 2020). ICT plays a pivotal role in modern society, impacting various aspects of daily life, business operations, education, healthcare, governance, and more. At its core, ICT includes computing devices such as computers, laptops, tablets, smartphones, and servers (Agarwal, Swami, & Malhotra, 2024). These devices are equipped with software applications that enable users to create, access, and manipulate information. Examples of such software include word processing programs, spreadsheets, databases, email clients, web browsers, and multimedia tools. Additionally, ICT encompasses storage devices like hard drives, solid-state drives, cloud storage solutions, and backup systems, which allow for the efficient management and preservation of digital data. Communication technologies are integral to ICT, facilitating the exchange of information between individuals, organizations, and systems (Thakur, Pathan, & Ismat, 2023). These technologies include telecommunications infrastructure such as wired and wireless networks, fibre optics, satellites, routers, modems, and telecommunication protocols (Pérez Neira, 2023). Through these networks, people can communicate via voice calls, video conferencing, instant messaging, emails, social media platforms, and collaborative tools (Lateef & Mairaj, 2024). The Internet, a fundamental component of modern ICT, serves as a global network that connects millions of devices and users worldwide, enabling seamless information sharing and online interactions (Gill et al., 2024).

Emerging technologies are expanding the scope of ICT and driving innovation across various domains. These technologies include artificial intelligence (AI), machine learning, big data analytics, blockchain, Internet of Things (IoT), virtual reality (VR), augmented reality (AR), and robotics (Javed et al., 2022). AI and machine learning algorithms enhance data processing capabilities and enable automation, predictive analytics, and intelligent decision-making. IoT connects everyday objects to the Internet, creating interconnected ecosystems for smart homes, cities, industries, and healthcare systems. Blockchain technology ensures secure and transparent transactions, particularly in finance and supply chain management. virtual reality (VR) and augmented reality (AR) technologies offer immersive experiences for training, entertainment, and visualization purposes (Schmitt, 2023).

2.2.1 ICT Access

ICT access refers to the ability of individuals, communities, organizations, and countries to effectively use and benefit from Information and Communication Technologies (ICT). It encompasses various dimensions, including physical access to ICT infrastructure, affordability of ICT services, digital skills and literacy, and socio-economic factors that influence ICT utilization. According to (Lythreathis, Singh, & El-Kassar, 2022) ICT access refers to the capacity and chance for people, groups, and organisations to use and profit from information and communication technology (ICT) resources, tools, and services. The accessibility of ICT hardware, including computers, smartphones, routers, and other gadgets that let people use digital technology (Gilani et al., 2024). Access to reliable, fast internet services via wired (fibre optics, broadband, etc.) or wireless (Wi-Fi, mobile networks, etc.) connections, enables users to send and receive emails, browse the internet, and use online platforms (Raghunandan, 2022). Proficiency with ICT tools and software, comprehension of digital content, online

platform navigation, and effective use of digital resources for study, work, and other objectives. affordability of ICT resources, including the price of devices, internet plans, software licencing, and other associated costs, to guarantee that access to technology is not impeded by financial constraints ensuring that different people are reached by equitable and inclusive ICT access, irrespective of their socioeconomic situation, geography, age, gender, disability, or other obstacles that could otherwise prevent them from participating in digital society (Huda, 2024). Sufficient infrastructure, comprising digital platforms, cloud services, data centres, and telecommunications networks, to facilitate the exchange of data and facilitate the provision of ICT services(Sjøvaag, Olsen, & Ferrer-Conill, 2024). In the current digital era, ICT access is essential because it enables people and communities to interact, communicate, work together, access information, learn new things, take part in the digital economy, and advance social and economic development (Qi, Sajadi, Baghaei, Rezaei, & Li, 2024). To fully utilise technology for beneficial effects and inclusive growth, governments, organisations, and stakeholders worldwide must prioritise bridging the digital gap and supporting universal ICT access (Olanrewaju, Adebayo, Omotosho, & Olajide, 2021).

Enhancing digital literacy, lowering obstacles, building infrastructure, and encouraging fair participation in the digital society are all elements of improving access to information and communication technology (ICT) (Strous, Davison, & Marín-Raventós, 2020). These programmes can be conducted at several levels, such as community-based initiatives, private-sector initiatives, government policies, and civil society efforts (Dutta & Dutta, 2021). Governments and telecom providers can work together to develop broadband infrastructure, boost internet access in underserved areas, and enhance the speed and dependability of networks (Marcus, Herrero, & Guetta-Jeanrenaud, 2024). Improved mobile network coverage, more accessible data

plans, and assistance with the rollout of 4G and 5G technologies can all help communities—particularly those in rural and isolated areas—have better access to mobile internet (Forge & Vu, 2020). Local communities can benefit from the possibilities to access digital resources and services through the establishment of community-based ICT centres, libraries, telecenters, and digital hubs equipped with technology and internet connectivity (Wagg & Simeonova, 2022).

2.2.2 ICT Use (Government and Individual use of ICTs).

ICT use refers to the utilization of Information and Communication Technologies (ICTs) in various aspects of society, including by governments and individuals (Fahlevi et al., 2024). ICTs encompass a wide range of technologies and tools that facilitate the creation, storage, retrieval, transmission, and manipulation of information (Ramalingam, 2022). These technologies include computers, smartphones, the internet, software applications, telecommunications networks, and digital platforms. Government use of ICT involves leveraging technology to enhance governance, service delivery, data management, public safety, and policy development (Criado, 2021). This includes initiatives like e-government platforms for citizen engagement, digital services for streamlined transactions, data analytics for informed decision-making, and cybersecurity measures for protecting sensitive information. On the other hand, individual use of ICT focuses on personal communication, information access, entertainment, e-commerce, and education (Abaddi & Al-Shboul, 2024). Individuals utilize ICT for activities such as social media interactions, online shopping, accessing educational resources, streaming entertainment content, and communicating through digital channels (Kumar, Katiyar, Mehrotra, Attri, & Vishnoi, 2024).

The government's ICT use aims to improve efficiency, effectiveness, and accessibility in public services, fostering citizen engagement and enhancing overall governance

(Iuliano, Cuadrado-Ballesteros, & Bisogno, 2024). In contrast, individual ICT use empowers people by providing access to information, enabling communication across distances, facilitating online transactions, and offering diverse entertainment and educational opportunities (Kasuk & Virkus, 2024). Both government and individual ICT use contribute to societal development, economic growth, and technological advancement. However, challenges such as the digital divide, data privacy concerns, cybersecurity risks, and technological literacy gaps need to be addressed to ensure inclusive and beneficial ICT use for all (Blakeborough & Roosalu, 2023).

2.3 Public Sector Performance

According to Iacuzzi (2022), public sector performance refers to how effectively and efficiently government entities manage their financial resources, report financial information, and comply with accounting standards and regulations. The emergence of organised societies and governments can be linked to the growth of the public sector (Ferry, Wegorowski, & Andrews, 2024). The idea of public sector performance was born out of the necessity for government, teamwork, and the delivery of basic services to communities (Sucha-Maya, 2024). There were primitive types of public administration and governance in ancient civilizations such as Mesopotamia, Egypt, Greece, and Rome (Arefeen, Islam, & Ahmed, 2022). In the past, governments were in charge of things like upholding law and order, overseeing infrastructure (including aqueducts and highways), collecting taxes, and offering residents essential services (Platt & Platt, 2014). The feudal lords and monarchs of mediaeval Europe ruled over domains and people during this time (Barras, 2023). Within their respective spheres of influence, they were in charge of resource distribution, defence, justice, and government (Raik, Blockmans, Osypchuk, & Suslov, 2024). A major change in governance occurred with the emergence of modern nation-states during the

Renaissance and Enlightenment periods. Centralization of authority, the establishment of official institutions, the development of administrative frameworks, and the provision of social welfare, healthcare, and education were all initiated by sovereign nations (Lavenia, 2024). Urbanisation, industrialization, and social transformations occurred quickly throughout the Industrial Revolution (18th and 19th centuries) (Grinin, 2022). To address concerns about urban growth, labour conditions, public health, and environmental difficulties, governments increased the scope of their activities (Vieira & Panagopoulos, 2024). The emergence of industrial capitalism and capitalism, in general, gave rise to discussions over the role of government in controlling the market, defending the rights of employees, resolving social injustices, and fostering economic growth (Kiran, Chaubey, & Shastri, 2024).

Public sector performance encompasses a range of activities and responsibilities that are vital for ensuring financial integrity, transparency, and effective resource management within government entities (Johari, Alam, & Said, 2021). At its core, public sector performance evolves around maintaining accurate financial records, adhering to relevant accounting standards, and upholding principles of accountability and government effectiveness (Handoyo, 2024). This involves the diligent preparation and presentation of financial statements that accurately reflect the financial position, performance, and cash flows of government agencies or organizations (Wagenhofer, 2024). Accounting professionals in the public sector play a crucial role in budgeting and financial planning processes. They are tasked with creating budgets that align with organizational goals, allocating resources efficiently, and monitoring expenditures to ensure compliance with budgetary constraints (Pauluzzo, Fedele, Pericolo, & Dokalskaya, 2024). By implementing robust internal controls, accounting professionals

help mitigate financial risks, prevent fraud and errors, and safeguard public funds (Jhunjhunwala, 2023).

Public sector performance involves regular audits by independent auditors or government audit agencies. These audits assure the accuracy and reliability of financial information, as well as the effectiveness of internal controls (Barrett AO, 2022). The audit process enhances accountability by holding public sector entities accountable for their financial management practices and adherence to accounting standards and regulations (Muraina & Dandago, 2020). In addition to financial reporting and compliance, accounting professionals in the public sector also contribute to performance measurement and evaluation. They use financial data, key performance indicators (KPIs), and analytical tools to assess the efficiency and effectiveness of government programs and initiatives (Ouda & Ouda, 2021). This information is crucial for decision-making, resource allocation, and continuous improvement efforts aimed at enhancing public sector performance. Moreover, the adoption of technology and automation has transformed the accounting landscape in the public sector (Abhishek et al., 2024). Advanced accounting software and digital tools enable real-time financial reporting, data analysis, and forecasting, empowering accounting professionals to make data-driven decisions and optimize financial management processes (Kee, 2024). Public sector performance refers to the effectiveness and efficiency with which government agencies and institutions carry out their responsibilities and deliver services to the public. In recent years, there has been a growing interest in studying and improving public sector performance (Stainer & Stainer, 2020). Several studies have explored the factors that contribute to public sector performance and how it can be enhanced (Radnor & McGuire, 2004). One such study by Boxall and Purcell examined the role of leadership in improving public sector performance (Stainer & Stainer, 2000).

They found that effective leadership, characterized by clear vision, strategic direction, and strong management skills, was positively associated with improved performance outcomes in government organizations (Radnor & McGuire, 2004). Another study by Hood and Lodge focused on the impact of public sector reforms on performance. They found that certain reform strategies, such as performance-based budgeting and accountability mechanisms, can contribute to improved performance outcomes in the public sector. Additionally, research by Grote and De Liddo explored the use of performance management systems in the public sector. They found that well-designed performance management systems, which include clear goals, regular monitoring, and feedback mechanisms, can help drive performance improvements in government organizations. They also emphasize the role of strategic direction and performance-based reforms in improving efficiency and effectiveness in government organizations.

The Progressive movement promoted government action in the United States and other nations in the late 19th and early 20th centuries to solve social issues, enhance public health, guarantee the safety of food and drugs, control monopolies, and defend consumer rights (Johnson, 2024). Governments were compelled by the Great Depression and World War II to embrace Keynesian economics and enact social welfare programmes, such as the New Deal in the United States and comparable measures in Europe (Türegün, 2022). Safety nets, unemployment insurance, healthcare systems, and other social services were established as a result of this (Ozili, 2021).

Following World War II, several nations saw economic prosperity, post-war reconstruction, and an increase in public sector activity. Governments were instrumental in the advancement of social security, healthcare, education, and infrastructure (Lee & Yuan, 2024). Debates concerning the extent and nature of the public sector arose in the second half of the 20th century (Cinar, Simms, Trott, &

Demircioglu, 2024). While some argued for market-oriented reforms, privatisation, and deregulation, others highlighted the value of public investments, social protections, and state intervention (Ribeiro, do Amaral, Salerno, Plonski, & Zancul, 2024); (Ma & Su, 2024); (Cardinale, 2022).

2.3.1 Accountability in the Public Sector

A key idea that is closely related to accounting procedures in the public sector is accountability (Oulasvirta & Rönkkö, 2023). It alludes to the responsibility placed on public servants and institutions to take responsibility for their deeds and choices, especially when it comes to the administration of public monies and resources (Doucet, Duinker, Charles, Steenberg, & Zurba, 2024). Accounting is crucial in this situation for guaranteeing responsibility, accuracy, and government effectiveness (Anesa & Bressan, 2024). Financial reporting effectiveness is the first step towards accountability (Ouda & Ouda, 2021). A clear picture of how public monies are distributed, spent, and managed is given to stakeholders, including the general public, by accounting procedures like budgeting, financial statements, and audits (Clerkin, Quinn, & Connolly, 2024). Holding public leaders responsible for their financial activities and decisions is made easier with transparent financial reporting (Roszkowska, 2021). Accounting in the public sector adheres to strict compliance and regulatory requirements established by regulating authorities (Ukwatte, Khan, Siriwardhane, & Ukwatte Jalathge, 2024). These guidelines guarantee the correct recording of financial transactions, justification of expenses, and appropriate asset management. By giving public servants a framework to work within and disclose their financial activity, these norms improve accountability (Koskimies & Kinder, 2024). Internal controls are a feature of public sector accounting systems that are intended to stop fraud, mistakes, and improper handling of funds (Brennan, 2020). The separation of responsibilities,

authorization processes, and routine financial activity monitoring are all part of these controls. Strong internal controls make it harder for people to participate in unethical or unlawful behaviour without being discovered, which strengthens accountability (Maulidi & Ansell, 2021). Accounting is not only important for financial responsibility but also for evaluating the effectiveness of public sector organisations (Bastida, Bracci, & Hoque, 2022). Several metrics and performance indicators, including cost-effectiveness ratios, service delivery benchmarks, and result evaluations, allow stakeholders to evaluate the efficacy and efficiency with which public resources are being used. Accountability is enhanced by performance measurement, which assesses how actions and resource distribution affect the accomplishment of public sector goals (Felicio, Samagaio, & Rodrigues, 2021). In the public sector, independent auditors' external audits add another level of accountability (Volodina, Grossi, & Vakulenko, 2023). To guarantee truth and openness, these audits examine financial statements, internal controls, and regulatory compliance (Kotb, Elbardan, & Halabi, 2020). Legislative committees and government watchdog organisations are examples of oversight entities that are essential in keeping public officials responsible since they examine financial records, look into anomalies, and suggest changes (Maulidi, Girindratama, Putra, Sari, & Nusantara, 2024). In the end, public confidence is fostered by accountability in the public sector through efficient accounting procedures. People are more inclined to trust their government and its institutions when they have access to trustworthy financial information, reassurance that public monies are managed appropriately, and channels for addressing issues or inconsistencies (Habbal et al., 2024). To keep a democratic society strong and make sure that public servants are held responsible for their actions and decisions, there must be trust (Bürger, 2024).

2.3.2 Government Effectiveness in the Public Sector

In the public sector, government effectiveness is an essential concept that supports accountability, builds confidence, and improves good governance (Lauwo et al., 2022). Government effectiveness is especially important in accounting since it allows stakeholders, including the general public, to be informed about financial data, reporting procedures, and decision-making processes (Agostini, Arkhipova, & Mio, 2023).

Government effectiveness in the public sector is critical for ensuring transparency, accountability, and efficient allocation of resources (Kulal, Rahiman, Suvarna, Abhishek, & Dinesh, 2024). Effective government practices not only bolster public trust but also enhance fiscal discipline and economic development (Kuttu, Soku, Amidu, & Coffie, 2024). Recent trends and initiatives globally underscore the significance of robust public sector accounting practices. Governments worldwide are increasingly adopting International Public Sector Accounting Standards (IPSAS) to improve transparency and accountability (Mnif & Gafsi, 2020). IPSAS provides a comprehensive framework for public sector entities to produce high-quality financial reports, facilitating better decision-making and public scrutiny (Khrais, Nassar, & Zaidan, 2024). The adoption of accrual-based accounting, as recommended by IPSAS, enables governments to provide a more accurate picture of their financial position and performance, moving beyond mere cash transactions (Dissanayake & Dellaportas, 2024). The digital transformation of the public sector has significantly impacted accounting practices. E-governance initiatives, such as electronic filing systems and digital financial management platforms, have streamlined accounting processes, reducing errors and enhancing efficiency (Bhattacharya, 2023). For example, the Government Financial Management Information System (GFMIS) implemented in

various countries has improved budget execution and financial reporting. These systems provide real-time data, aiding in more effective monitoring and control of public funds. Investing in the professional development of public sector accountants is crucial for transparency. Training programs and continuous professional education help accountants stay updated with the latest standards and practices. Organizations like the International Federation of Accountants (IFAC) and the Chartered Institute of Public Finance and Accountancy (CIPFA) offer certifications and training tailored for public sector accountants (Mnif & Gafsi, 2020). This professionalization ensures that public sector accountants are well-equipped to handle complex financial environments. Effective government accounting practices play a pivotal role in combating corruption. Transparent financial reporting and stringent audit mechanisms deter fraudulent activities and ensure that public resources are used for their intended purposes (Kassem, 2022). The establishment of independent audit institutions, such as the Office of the Auditor General, reinforces accountability. These institutions conduct regular audits and publicize their findings, thereby fostering a culture of integrity within the public sector (Johari, Alam, & Said, 2021).

2.3.3 Corruption in the Public Sector

One major issue that threatens government effectiveness, accountability, and efficient governance in the public sector is corruption. It describes the misuse of authority, status, or resources by public servants for their gain or the advantage of a certain group, frequently at the price of the general welfare (Okpara & Mamman-Muhammad, 2022). Bribery, embezzlement, fraud, nepotism, favouritism, and the plunder of public funds are just a few examples of the many ways corruption manifests itself (O'Hara, 2022). Systems and procedures for accounting are essential for identifying, stopping, and opposing corruption in the public sector (Pilonato, 2022).

Probably the most popular approach to characterise corruption is to use words that convey hatred and disdain for the procedure and everyone who is a part of it. Consider the remarks made by Edward Clay, the UK High Commissioner in Nairobi, regarding the ministers of the Kenyan government "It seems that those in government now have the conceit, the greed, and maybe the panic to eat like gluttons." They might anticipate that we won't notice or pardon them for a small act of gluttony (Arayankalam, Soral, Khan, Krishnan, & Bose, 2024). But when their gluttony makes them urinate all over our shoes, they can hardly expect us to be indifferent (Ellisa & Luana, 2022). We'll discuss some of the ramifications of this charge in more detail later, but it represents a prevalent puritanical ethical position on corruption that places the blame on human fallibility. As understandable as this may be, particularly in situations when someone is being forced to pay money they don't have to or is suffering as a result of dishonest people manipulating the system, it doesn't provide much information for those who are curious about the specifics of what is going on and why (J. Robinson & Edwards, 2024). A few social scientists started looking more objectively at how corruption functions in developing nations in the 1960s. It will take only a few instances to demonstrate the general direction of their argument. According to Leff (2020), bribery is a tactic used by businesspeople to get around limitations imposed by an unfriendly or uncaring system of government. Leys (2022) noted that corruption was common in developing nations and questioned if this wasn't due to the unsuitable and ineffective state structures that were left over from the previous colonial powers. He recognised corruption as a problem, but he did not want to moralise about it. The issue is that corruption can impede a country's progress by stealing money from the economy from individuals with offshore accounts, depressing the populace, taking focus away from constructive economic endeavours, and discouraging foreign lenders, donors, and

investors (Lauer, 2024). This detached approach was further developed by Bayley (2018), who introduced the idea that corruption did not always imply that growth would be impeded. He created a case for the positive impacts of corruption after examining its negative effects. Though this line of reasoning has never been in style, it highlights how corruption can stimulate economic activity, provide a way for marginalised groups to access opportunities, lessen the inflexibility of government planning, and dismantle the stifling power of intransigent bureaucracies. Such arguments, while repugnantly immoral at first glance, do serve a useful purpose in enlightening us about corruption and its consequences (Samkin, Mihret, & Lemma, 2024). Additionally, studying history provides insights into how societies that were severely compromised progressed towards the eradication of the majority of corrupt practices (Badur, Yılmaz, & Sensoy, 2024). For instance, submitting the authority of the state, as represented by the crown, to control a broader public interest represented by parliament was a major factor in the political conflicts of the seventeenth century in England, including the Civil War of 1642–1649, the Commonwealth and Protectorate of 1649–1660, and the Glorious Revolution of 1688 (Pihl, 2024). The settlement reached in 1688 established solid institutional frameworks that serve as the cornerstone of contemporary British society. Parliament had to approve any political decisions that were made (Grajzl & Murrell, 2024). Parliament imposed levies that were used to fund predetermined goals. The judiciary's independence was upheld. The Bank of England was established after 1694 to manage the government's loan funds and guarantee payment continuity. When combined, these constitutional provisions eliminated the arbitrary nature of the monarchical system's power exercise and broadened the aristocratic, landed, and wealth-owning classes' access to power (Kyriacou, 2023)

The crucial point for our purposes is that these large-scale, powerful developments did not lead to the emergence of sane, impartial governance (Schuett, Reuel, & Carlier, 2024). On the contrary, England was a hugely prosperous society that developed safely and quickly in a variety of complementing ways for more than a century following 1688, but it was governed by a system that was commonly referred to as "the old corruption." Choices were made based on intricate and extensive political coalitions that were made feasible by the unethical allocation of access to funding sources, profitable positions, and various benefits and privileges (A. Xu, 2024). Large-scale unfairness, injustice, waste, and occasionally national failures were all part of the system, but it was also vitally open to initiative, skill, and energy and produced enormous gains in trade, agriculture, manufacturing, culture, and the arts (Bremmer, 2022). Democratic thinkers found the relatively narrow and oligarchic nature of eighteenth-century corruption intolerable, and by the nineteenth century, it was widely acknowledged that a stronger nation with the world's most prosperous economy needed a more responsible and logical system (Williams, 2023). Political discourse was soon dominated by a robust notion of the public interest, and behaviours that were normal under the previous regime quickly became unacceptable under the current one. Important responses to this shift in public perception include the following, according to Doig (2003, p. 179): laws prohibiting the use of parliamentary membership as a means of personal gain in exchange for government support; verbal disclosure requirements for financial interests; restrictions on honorarium payments; distancing MPs and ministers from the patronage and spoils systems that dominated traditional politics; restrictions on civil servants leaving the government to enter the private sector; prohibitions against voter bribery; and laws against corruption in both public and private sectors. All of this and more was required to establish a society that, fortunately,

remained free of most forms of corruption throughout the 20th century and continues to rank extremely low in global indices of corruption at the start of the 21st (Government effectiveness International, 2003). The goal of summarising British society's progress in eradicating corruption is not to defend a unique virtue; rather, it may be argued that Britain moved away from corruption because it could afford to do so (Turksen & Chauhan, 2018). It's also true that corruption still exists and that a significant portion of it is exported by Britain. It has come to light on multiple occasions that British corporations have made large-scale illicit payments to influential people in nations where trade connections are desired. The most commonly mentioned industries are probably the oil and defence sectors, but payments of this kind are probably present in all kinds of international business transactions, and executives of the involved companies are undoubtedly willing to defend their actions by pointing to the benefits to their organisations and the country as a whole (Pettersen & Grøtan, 2024). The purpose of talking about British corruption history is to illustrate how a society functions through corruption at first, before transitioning to a more transparent and equitable structure (Benesova & Anchor, 2024). It provides proof that something is feasible and aids in figuring out the methods by which it can be accomplished (Rendall, Curtin, Roy, & Teasdale, 2024). The previous paragraphs provide an overview of corruption, but they fall short of providing a true understanding of why it is so despised, even though corruption can occasionally be demonstrated to contribute to the general progress of a country (Weber, 2024). To achieve this, it is important to highlight two facets of the corruption issue as it truly manifests itself in developing nations. The first of these is predatory corruption, which occurs when a tiny group of vicious elites, whether elected or in positions of authority they have unlawfully taken, gather around leaders. In addition to devaluing public life, this corruption has harmed the commercial

world by promoting an immoral business mentality (Lamberton, Wein, Morningstar, & Ghai, 2024).

Leaders like Mobuto in Zaire or Moi in Kenya have amassed enormous fortunes, which are likely comparable in magnitude to those amassed by Sir Robert Walpole, the man who served as the country's de facto ruler from 1721 to 1742, effectively becoming the country's first prime minister and a prime example of old corruption (He et al., 2024). The main distinction is how these contemporary rulers' own family members, friends, and commercial and political allies have removed wealth from the nation under their control and transferred it to foreign bank accounts, real estate, and other investments (Barfield, 2022). In addition to effectively robbing countless individuals, as British corruption from the eighteenth century did, predatory corruption of leaders has also negatively impacted the nation's economy overall by syphoning off wealth to the benefit of Swiss bankers and the economies of rapidly growing capital importers from the Middle East and South East Asia (Warf & Warf, 2019). On the other hand, the old corruption's predation in the eighteenth century recycled the funds back into the national economy (Wendler, 2023). Edward Clay was criticising predator corruption in the speech that was mentioned before, and it is very difficult for anyone who is not a part of the corrupt circle to not be appalled by what he says. The second is the prevalence of small-time corruption among those in charge of providing public services, such as the police, the courts, federal and local government representatives, and medical personnel. The requirement to pay officials to receive services redirects the provision of those services away from those who are unable to pay and towards those who can (Kuhfuss, Burns, Shortall, & Vinten, 2024). It is present in such a constant manner that, on occasion, people need to be reminded by journalists and other observers that it is something to be valued (as seen by the quotation in this paper's

introduction). It manifests in a variety of ways, such as the practice of obtaining necessary government forms—which ought to be openly accessible—by charging the public (Forsyth, Guiomard, & Niemeier, 2020). Simultaneously, it offers a crucial supplementary income to underappreciated and neglected labour groups, thus averting the complete collapse of overburdened public services. This makes it a type of "beneficial" corruption that the economists mentioned previously have recognised. It could manifest as a uniform and entirely predictable tariff, or it could be capricious and arbitrary, but its constant presence in the lives of community members is what unites them (Meyer, Luiz, & Fedderke, 2024). The majority of people view it as an unlawful tax that they must attempt to budget for and that will take a sizable portion of their annual income, while for some in society who earn comfortable salaries, it may only be a minor irritation or nuisance (Lauer, 2024). Because of this, corruption cannot be accepted, and efforts by civil society organisations around the world to eradicate it are a key component of democratic political platforms (Sadik-Zada, Gatto, & Niftiyev, 2022).

2.4 ICTs and Public Sector Performance

Information and Communication Technologies (ICTs) have revolutionized the public sector, leading to significant improvements in efficiency, accuracy, government effectiveness, accountability and control of corruption (Thommandru, Maratovich, & Saparovna, 2024). The integration of ICTs has transformed traditional accounting practices, enhancing public sector performance. ICTs automate routine financial tasks such as data entry, reconciliation, and reporting (Arkhipova, Montemari, Mio, & Marasca, 2024). Accounting software, enterprise resource planning (ERP) systems and cloud-based platforms streamline financial management processes, reducing manual errors and saving time (Olaoye & Potter, 2024). This automation enables public sector

organizations to manage their budgets, expenditures, and revenue streams more effectively (Yerlikaya & Erzurumlu, 2021). ICT tools ensure data accuracy by minimizing human errors and facilitating real-time data updates. With features like data validation, automatic calculations, and audit trails, accounting systems provide reliable financial information for decision-making and reporting purposes (Wang et al., 2024). This accuracy improves financial effectiveness and builds trust with stakeholders. ICTs enable standardized and timely financial reporting by regulatory requirements and accounting standards (Thottoli, 2024). Integrated reporting modules, dashboards, and analytics tools help public sector entities generate comprehensive financial statements, performance reports, and compliance documentation efficiently (Doni, Bianchi Martini, Corvino, & Mazzoni, 2020). This ensures adherence to legal and financial regulations, enhancing accountability and governance. ICTs support effective budget planning, allocation, and monitoring processes. Budgeting software and forecasting tools enable public sector organizations to create and track budgets, analyze variances, and adjust financial plans as needed (Neri, Niccolini, & Martino, 2024). This proactive approach to budget management improves fiscal discipline and resource utilization. ICTs contribute to better risk management practices by providing data-driven insights and risk assessment tools (Basile, Carbonara, Panniello, & Pellegrino, 2024). Risk management software, data analytics, and scenario modelling help identify and mitigate financial risks such as fraud, errors, and compliance issues. This proactive risk management approach safeguards public sector finances and assets. ICTs facilitate accessibility to financial information and collaboration among stakeholders (Shishehgarhaneh, Moehler, Fang, Aboutorab, & Hijazi, 2024). Cloud-based accounting systems and online portals allow authorized users to access financial data anytime, anywhere, promoting accountability and stakeholder engagement.

Collaboration tools also enable seamless communication and coordination among finance teams and departments (Javaid, Haleem, Singh, & Sinha, 2024).

2.4.1 The Roles of ICTs in Public Sector

2.4.1.1 Improve communication

In the modern world, information and communication technologies, or ICTs, are essential for enabling communication in a variety of settings (Akyar, Monteiro, & Fernandes, 2024). They enable real-time interactions worldwide, surpassing geographical boundaries. ICTs provide seamless communication between individuals, businesses, and societies by enhancing connectedness through social media, video conferencing, email, and instant messaging. ICTs speed up decision-making and information sharing (Lake, 2022). Collaboration tools like Google Workspace and cloud computing enhance teamwork and document sharing. Additionally, ICTs promote diversity by improving accessibility for individuals with disabilities through assistive technologies. ICTs are essential for organising response operations and distributing important information during emergencies (Malhotra, Manchanda, Bhilwar, & Basu, 2021). By removing language barriers with the use of translation software and language learning applications, they also improve intercultural understanding (Cotton, Cotton, & Shipway, 2024). Through e-commerce and digital marketing, ICTs promote entrepreneurship, increase market reach, and streamline operations—all of which contribute to economic growth (Modgil, Dwivedi, Rana, Gupta, & Kamble, 2022). With the help of educational apps, online courses, and virtual classrooms, ICTs are revolutionising education and making high-quality education more accessible to all people (Moro, Mills, Phelps, & Birt, 2023).

2.4.1.2 Enhance Education

ICTs are essential to improving education in the modern world since they have revolutionised teaching methods and increased access to high-quality education worldwide (Hu & Zhang, 2020). Several benefits provided by these technologies help to make education more efficient and inclusive. Through interactive multimedia resources, instructional apps, and online platforms, ICTs enable personalised learning (Chatterjee, Gantait, Swamy, & George, 2023). Access to a multitude of educational resources catered to individual requirements and learning preferences allows students to study at their speed and gain a deeper comprehension of the material. ICTs remove obstacles based on location, giving students in underserved or rural places access to online learning resources and knowledgeable teachers (Monyai, 2024). Students and professors in distant places may connect in real time, work together on projects, and share information thanks to virtual classrooms and video conferencing capabilities. Through online classes, webinars, and digital libraries, ICTs offer chances for professional growth and lifetime learning (Ahluwalia, Hothi, & Dutt, 2023). People can improve their career chances and adjust to changing employment needs in a quickly growing digital landscape by gaining new skills, certifications, and qualifications (Hassock & Hill, 2022).

2.4.1.3 Energising Economic Development

Today's world depends heavily on Information and Communication Technologies (ICTs) to drive economic growth. These technologies revolutionise business operations, open up new markets, and encourage entrepreneurship and creativity (Naseem, Hu, Shi, Mohsin, & Jamil, 2023). ICTs use digital tools, automation, and data analytics to improve efficiency and streamline business processes. Cloud computing services help businesses make data-driven choices and increase operational efficiency

by providing cost-effective means of storing, processing, and analysing large amounts of data (Javaid et al., 2024). ICTs give companies of all sizes access to markets and worldwide connections. Businesses can expand into new areas, reach a global consumer base, and diversify their revenue streams by utilising e-commerce platforms, digital marketing tactics, and online payment systems (Charfeddine, Umlai, & El-Masri, 2024). ICTs facilitate innovation and entrepreneurship by offering venues for cooperation, idea exchange, and resource and finance access. ICTs can be used by startups and small businesses to create and expand innovative goods and services that will provide them with a competitive edge across a range of industries, as well as to create jobs and diversify the economy. ICTs provide virtual mentorship possibilities, digital skills courses, and online training programmes that help with skill development and workforce readiness (Uduafemhe, Ewim, & Karfe, 2023). In today's digital economy, using ICTs successfully and promoting sustainable economic growth depends on having a workforce with digital skills (Ihamäki & Kaivo-oja, 2024).

2.4.1.4 Boosting Public Services and Governance

In the modern world, information and communication technologies (ICTs) are essential for strengthening public services and empowering governance. These technologies provide a range of platforms and tools that enhance service delivery, citizen involvement, government efficiency, and effectiveness (Cheshmehzangi, 2022). ICTs simplify workflows, improve data management, and streamline administrative procedures to enable digital transformation in governance. ICTs can be used by governments to support e-governance projects like electronic voting, digital document management, and citizen service portals, which would speed up decision-making and enhance service delivery (Manoharan, Subramaniam, & Mohapatra, 2023). ICTs facilitate public access to government information, online reporting tools, open data

initiatives, and accountability in governance. Real-time data on government operations, spending plans, and performance indicators are available to the public, encouraging civic engagement, oversight, and trust. ICTs improve public participation and engagement in political processes (Lnenicka et al., 2024). Governments can interact with individuals, solicit their opinions, and involve them in the formulation of policies and decisions using social media platforms, online discussion boards, and mobile applications (Mansoor, 2021). This fosters responsive public services and inclusive governance. By offering digital platforms for healthcare, education, transportation, and other vital services, ICTs enhance the delivery of public services. The quality, efficiency, and accessibility of public services are improved via telemedicine, e-learning platforms, digital payment systems, and smart infrastructure solutions, especially in rural or underserved areas (Lopes, Macadar, & Luciano, 2019). By offering geospatial technology, data analytics, and communication capabilities for monitoring, early warning, and coordination during crises, ICTs assist in emergency response and disaster management (Banzal, 2022).

2.4.1.5 Improving Healthcare Services

Today's healthcare services are greatly improved by Information and Communication Technologies (ICTs) since they improve patient outcomes, access, efficiency, and quality of care (Nafiu, Agboge, Okpebenyo, & Sule, 2024). Through telemedicine, remote monitoring, and mobile health (mHealth) apps, ICTs enhance access to healthcare services. Patients can consult with doctors remotely thanks to telemedicine, which is especially helpful in underserved or rural areas without access to real healthcare facilities (Butt et al., 2024). Healthcare practitioners can follow patients' vital signs and health data in real time with the use of remote monitoring technology, such as wearables and IoT-enabled medical equipment. This allows for preemptive

treatments and individualised care (Prithi, Poongodi, Sumathi, & Suresh, 2021). With the help of mHealth apps, patients may take charge of their health and well-being by using resources for self-management, prescription reminders, appointment scheduling, and health education. By streamlining administrative procedures, electronic health records (EHRs), and digital workflows, ICTs improve the effectiveness of healthcare delivery (Istepanian & AlAnzi, 2020). EHR systems improve care coordination and continuity by centralising patient data, enabling safe data sharing among healthcare providers, minimising errors, and reducing paperwork (Reza, Prieto, & Julien, 2020). PACS (Picture Archiving and Communication Systems) is one example of a digital imaging technology that enhances diagnostic accuracy, expedites image interpretation, and makes teleradiology services easier for remote consultations (Karera, Engel-Hills, & Davidson, 2024). ICTs use data analytics, artificial intelligence (AI), and health informatics to support clinical decision-making and evidence-based medicine. Large-scale healthcare data is gathered and analysed using health informatics systems, which produce insights for research, predictive modelling, population health management, and disease surveillance (Pramanik et al., 2020). Through digital health campaigns, immunisation registries, outbreak tracking systems, and patient education platforms, ICTs enable public health initiatives, disease prevention, and health promotion (Gresham et al., 2024). AI-driven algorithms help healthcare professionals diagnose diseases, predict treatment outcomes, optimise treatment plans, and identify personalised interventions, ultimately improving clinical outcomes and patient safety (Khalifa & Albadawy, 2024). These programmes improve the health of the community, lessen healthcare inequities, and encourage people to lead healthier lives (McGowan et al., 2021).

2.4.1.6 Job Opportunities

The digital skills gap, which affects people's employment and career prospects, can be caused by a lack of access to digital technologies and digital literacy programmes (Nikou, De Reuver, & Mahboob Kanafi, 2022). Digital skills including computer fluency, online research, data analysis, and software usage are necessary for many jobs nowadays (Carlisle, Ivanov, & Dijkmans, 2023). Without these abilities, people could have difficulty breaking into or growing in the workforce. The COVID-19 outbreak brought to light how crucial digital connectivity is for working remotely and taking advantage of online jobs (Dunn & Dunn, 2024). The economic potential of people and communities who lack access to dependable internet connections and digital platforms may be restricted as a result of missing out on opportunities for freelance work, digital entrepreneurship, e-commerce, and remote labour (Modgil et al., 2022).

2.5 Digital Innovation in the Public Sector

To enhance service delivery, governance effectiveness, citizen engagement, and total public value, new concepts, approaches, technologies, policies, and practices are introduced into government organisations and agencies through the process of public sector innovation (Cinar, Simms, et al., 2024). To effectively handle difficult problems, satisfy changing citizen expectations, improve efficiency, encourage openness, and provide favourable societal results, innovation in the public sector is crucial (Mergel, Edelmann, & Haug, 2019).

2.5.1 The Value of Digital Innovation in the Public Sector

2.5.1.1 Fulfilling Needs of Society

One of the main goals of public sector innovation is to meet social requirements, which entails coming up with innovative ways to solve urgent problems and enhance the lives of individuals (Giesecke & Schartinger, 2024). A few of the many issues that societies

deal with are public safety, healthcare availability, education quality, environmental sustainability, social inclusion, and economic inequality (Ferrante et al., 2024). Governments can address these issues more successfully when public sector innovation is used to introduce creative policies, programmes, services, and initiatives that are suited to particular social requirements (Khanal, 2024). Innovation in the public sector is essential to improving the way that citizens are served by the government. Governments may ensure that services are available, responsive, and of the highest calibre while streamlining procedures, cutting red tape, and increasing efficiency by utilising technology, data analytics, user-centred design, and agile approaches (Rockman, 2022). Innovation in the public sector addresses important determinants like health, education, employment, housing, social assistance, and environmental circumstances, all of which improve residents' overall well-being (Cohen, Stein, Hancock, & Morales, 2024). The opportunities and quality of life accessible to individuals and communities are directly impacted by innovations in infrastructure development, healthcare, education, social assistance programmes, and community services (Mishra & Chakraborty, 2020). Promoting inclusion, equity, and social justice in the public sector requires innovation. Through the development of policies and programmes that take into account the requirements of underprivileged communities, marginalised populations, and vulnerable groups, governments can lessen disparities, improve service accessibility, and promote stronger social bonds. Innovation in the public sector is essential for improving response capabilities, preparedness for disasters, and resilience. Innovations in risk assessment, crisis communication, emergency management, and resilience planning assist governments in reducing risks, ensuring public safety and security, and responding to crises with efficiency (Lo Presti, Maggiore, Marino, & Resciniti, 2023). Cutting-edge methods of governance,

accountability, government effectiveness, and citizen engagement bolster democratic processes, encourage faith in public institutions, and enable people to take part in public affairs, policymaking, and decision-making (Deng, Hu, Guan, Chen, & Menendez, 2024). Digital platforms, feedback mechanisms, participatory budgeting, and open data projects all improve accountability, government effectiveness, and public trust (Al Sulaimani & Ozuem, 2022).

2.5.1.2 Encouraging Effectiveness

For governments to effectively provide services, make better use of their resources, and produce better results for their constituents, efficiency promotion is a crucial component of public sector innovation (Alkhatib & Valeri, 2024). Public sector innovation is centred on making the best use of resources like money, people, infrastructure, and technology (Bezzina et al., 2021). Governments may improve overall efficiency by streamlining operations, cutting waste, and allocating resources where they are most needed by introducing new solutions like automation, digitalization, data analytics, and lean procedures (Sonar, Sharma, Ghag, & Raje, 2024). Public sector innovations improve service delivery by streamlining, opening up, and simplifying procedures for citizens. For instance, faster transactions, less administrative work, and round-the-clock access to information and services are made possible by digital platforms, online services, and mobile applications, all of which increase service delivery efficiency (Momen & Ferdous, 2023). Decision-makers benefit from real-time information, predictive analytics, and data-driven insights provided by public sector innovation. This ultimately results in more effective governance and resource allocation by empowering governments to make well-informed decisions, rank initiatives according to their impact and efficacy, and react proactively to new issues (Y. Li, Tao, Qian, Mlecnik, & Visscher, 2024). Adaptability

to shifting economic conditions, technological breakthroughs, and societal demands is essential for efficiency in the public sector. Governments may remain flexible, predict emerging trends, and modify policies, services, and plans in response, making sure that resources are used effectively and efficiently to handle changing issues. This is made possible through innovation (Cinar, Simms, et al., 2024). Improved value for public investments and cost savings are the results of creative thinking and efficient procedures (Amankwah-Amoah, Abdalla, Mogaji, Elbanna, & Dwivedi, 2024). Governments may increase efficiency, enhance service quality, and optimise the impact of public spending by doing away with redundancies, streamlining workflows, and utilising technology. These actions will ultimately benefit taxpayers and residents (Sutradhar et al., 2024).

2.5.1.3 Encouraging Public Participation

To enable individuals to actively participate in governance, decision-making processes, and the co-creation of public policies and services, fostering citizen engagement is an essential feature of public sector innovation (Mega, 2022). Innovation in the public sector encourages cooperation among stakeholders, including individuals, civil society organisations, and governments (Yuan & Gasco-Hernandez, 2021). Through consultations, feedback mechanisms, and participatory platforms, governments may ensure that policies and services are designed, implemented, and evaluated with citizen input, making solutions more inclusive, relevant, and responsive to the needs and preferences of the populace (van Toorn, 2024). Government effectiveness, accountability, and trust in governmental institutions are all enhanced by citizen engagement (Sonnenfeld, Stevenson, & Waddington, 2024). Public trust and governance effectiveness are enhanced when citizens are empowered to hold governments responsible, monitor performance, and participate in decision-making

processes through open data initiatives, digital government effective platforms, and information access (C. Xu & Chen, 2023). Public sector innovations allow citizens to co-create solutions by utilising their knowledge, skills, and experiences (Strokosch & Osborne, 2021). Governments may utilise various perspectives, creativity, and collective intelligence to handle complex challenges, generate innovation, and improve societal results through citizen panels, hackathons, co-design workshops, and crowdsourcing (Loeffler & Loeffler, 2021). The creation of user-centric services that cater to the unique requirements and preferences of residents is facilitated via citizen involvement (Hou, Ho, & Yau, 2024). Governments can create services that are more user-friendly, accessible, and suited to citizen expectations by asking for input, carrying out user research, and making adjustments based on user insights (Bezzina et al., 2021). This will increase citizen happiness and trust in public services. Innovation in the public sector enables people to take an active role in community projects, political processes, and civic life (Mega, 2022). Governments may enhance democratic principles, civic involvement, and social cohesion by offering opportunities for civic education, volunteering, community organising, and digital platforms for civic engagement. This will ultimately lead to the development of a more involved and empowered populace (Mega, 2022).

2.5.1.4 Enhancing Services Delivery

Improving the accessibility, efficacy, efficiency, and quality of public services for citizens is a primary goal of public sector innovation, and one of its main goals is to enhance service delivery (Lopes et al., 2019). The goal of public sector innovation is to increase citizens' access to and convenience with services by utilising technology and digital solutions (Cinar, Demircioglu, et al., 2024). For instance, citizens can now access services from anywhere at any time using online portals, smartphone apps, and

self-service kiosks, which lowers obstacles like time limits, distance, and bureaucratic procedures. When the public sector innovates, high-quality services that are customised to each citizen's unique requirements and preferences are created (Cinar, Demircioglu, et al., 2024). Governments may provide tailored, user-centric services that are productive, efficient, and sensitive to the expectations of their constituents by utilising data analytics, user feedback, and design thinking principles (Okunlaya, Syed Abdullah, & Alias, 2022). Efficiency is increased by public sector innovation through workflow optimisation, administrative load reduction, and process streamlining (Brandín & Abrishami, 2024). Governments can now provide services more quickly, more accurately, and more affordably because of automation, digitization, and smart technologies, which boost productivity and make better use of available resources (Attaran, 2023). Citizens' overall user experience is improved by creative approaches to service design and delivery. User journeys, usability testing, and citizen co-creation guarantee that services are intuitive, user-friendly, and aligned with demands, which increases citizen happiness and trust in public services (Kandil, Dessart, Standaert, & Bosma, 2024).

2.5.1.5 Promoting Economic Development

Promoting economic growth is a vital component of innovation in the public sector since it boosts competitiveness, wealth creation, employment, and sustainable development (Indrawati & Kuncoro, 2021). Innovation in the public sector is essential for creating innovation ecosystems because it promotes entrepreneurship, R&D, and technical breakthroughs. In major industries including technology, healthcare, renewable energy, and advanced manufacturing, governments promote innovation-driven growth through programmes like funding programmes, incubators, and innovation hubs (CICC Research, 2024). Funding, mentorship, training, and market

opportunities are all made available to SMEs, startups, and entrepreneurs through public sector innovation projects. This support structure generates innovation, promotes entrepreneurship, and establishes an atmosphere that is favourable for SMEs to prosper and contribute to economic expansion. Investments in vital infrastructure, such as digital infrastructure, energy, telecommunications, and transportation, are included in public sector innovation (Marsal, Hamdan, & Aljazzar, 2023). In metropolitan regions, the development of smart cities, sustainable infrastructure, and connection networks boosts economic growth, draws investments, improves the quality of life, and increases productivity (Kolte & Goswami, 2022). Innovation in the public sector helps sectors and industries become more competitive in international marketplaces. This comprises programmes that help firms innovate, grow their markets, and produce goods and services with added value, like industry clusters, export promotion, trade agreements, regulatory reforms, and innovation alliances (AlSaied & Alkhoraif, 2024). Through investments in clean technologies, sustainable practices, renewable energy, and circular economy projects, public sector innovation helps to accelerate the shift to a green economy (Mentes, 2023). These technologies improve resource efficiency, lessen their negative effects on the environment, generate green jobs, and set up economies for resilience and long-term growth (Cheng, Yan, Ye, & Chen, 2024).

2.5.2 Crucial Public Sector Innovation Strategies

2.5.2.1 Adoption of Technology

Adopting technology is a key strategy for innovation in the public sector since it helps governments improve service delivery, modernise operations, and use digital tools for improved governance (Leitner & Stiefmueller, 2019). Adopting digital technologies like cloud computing, AI, data analytics, IoT, and mobile applications helps governments change procedures, increase productivity, and provide residents with

better services (Agarwal, Swami, & Malhotra, 2022). Putting money into digital literacy, skill-building, and training programmes for public sector workers increases their capacity, encourages innovation, and makes it possible for them to leverage technology platforms and tools for governance and service delivery (Al-Okaily et al., 2024).

2.5.2.2 Open Innovation

Since open innovation entails working with outside partners, exchanging information, and jointly developing solutions to difficult problems, it is an essential tactic for public sector innovation (Khanal, 2024). Forming alliances with organisations, companies, non-governmental organisations, and individuals promotes a cooperative environment for exchanging concepts, knowledge, assets, and optimal methods, resulting in creative resolutions and enhanced services (Doucet, Duinker, Zurba, Steenberg, & Charles, 2024). Governments can obtain a variety of viewpoints, ideas, and comments by involving people, experts, and stakeholders in crowdsourcing platforms, hackathons, and co-creation workshops (Anthony Jr, 2023). This makes it easier to build user-centric policies and services. Fostering accountability, trust, and engagement with the public, researchers, and companies through open data programmes, government effectiveness, and access to government information encourages data-driven innovation and well-informed decision-making (Mureddu, Osimo, Kenny, Upson, & Peristeras, 2022). Putting on innovation challenges, contests, and awards stimulates innovation, entrepreneurship, and problem-solving among participants, leading to the creation of new answers to social problems and fostering an innovative culture (Ciriello, Richter, & Mathiassen, 2024). By engaging in knowledge-sharing networks, communities of practice, and collaborative platforms, governments can foster innovation and continuous improvement in public sector services and operations by exchanging best

practices, learning from one another, and using shared experiences (Fabiani, Frondizi, & Rossi, 2024).

2.5.2.3 Applying Design Thinking

Since design thinking places a strong emphasis on empathy, user-centricity, and iterative problem-solving to produce creative solutions that successfully address citizen demands, it is an essential tool for public sector innovation (Bongiovanni & Louis, 2021). By putting citizens' wants, preferences, and experiences front and centre in the process of developing solutions, design thinking techniques help create services and policies that are clear, understandable, and adaptable (Røhnebæk et al., 2024). Governments may better design solutions that solve real-world difficulties by doing empathic research, which includes user interviews, observations, and feedback sessions (Pacheco-Barrios et al., 2024). This helps governments acquire insights into citizen viewpoints, pain spots, and goals (Pacheco-Barrios et al., 2024). Governments may swiftly validate concepts, get feedback, hone solutions, and iterate based on user input by using prototype and iterative testing (Rajendran & Sundarraj, 2024). This ensures that finished goods and services live up to user expectations and produce the intended results. In the public sector, promoting cross-functional cooperation and multidisciplinary teams brings together a variety of knowledge, viewpoints, and abilities to tackle challenging issues, stimulate creativity, and lead to innovative solutions (Andriyani, Yohanitas, & Kartika, 2024). Governments can co-create policies with citizens, stakeholders, and experts by utilising design thinking in policy design. This ensures that policies are impactful, inclusive, and responsive to societal demands (Dushkova & Kuhlicke, 2024).

2.5.2.4 Fast Work Processes

Rapid workflows are crucial tactics for public sector innovation because they simplify procedures, cut down on red tape, and boost citizen service delivery effectiveness (Ponti et al., 2022). Governments can increase overall efficiency in service delivery and operations by streamlining processes, removing pointless stages, and identifying bottlenecks, redundancies, and inefficiencies in workflows (Tehrani, Ray, Roy, Gruner, & Appio, 2024). Workflow automation, robotic process automation (RPA), and digital tools are used to automate repetitive operations, minimise errors, eliminate the need for human interaction, and speed up processes in areas including document processing, approvals, and data entry (Chakraborti et al., 2020).

2.5.2.5 Data-Driven Decision Making

Evidence-based policy analysis, resource allocation based on data-driven insights, and decision-making based on facts are supported by utilising data analytics, predictive modelling, performance indicators, and real-time monitoring (X.-C. Li et al., 2024).

2.5.2.6 Policy Experimentation

Regulatory sandboxes, evidence-based policy experiments, and pilot projects enable governments to test novel concepts, assess results, learn from mistakes, and scale up initiatives that work (Scarborough, Sanfilippo, Ziemann, & Stavropoulou, 2024).

2.5.3 Types of Digital Innovation in the Public Sector

2.5.3.1 E-Government Services

E-government services are a prime example of innovation in the public sector since they use digital technologies to revolutionise the way government organisations communicate with the public, private sector, and other stakeholders (Ogah & Nwokolo, 2022). To provide citizens with a centralised platform to access a variety of services and information, governments use online portals (Othman, Razali, & Nasrudin, 2020). For chores like paying taxes, getting government aid, registering for permits, renewing

licences, and accessing public data, these portals offer a seamless, one-stop-shop experience (Prabhu, 2021). On their smartphones or tablets, users can access government services and information through e-government mobile apps. Push notifications, geolocation capabilities, secure login choices, and personalised content are just a few of the features that these apps frequently offer, improving accessibility and convenience for users who are always on the go. Digital payments for a range of government transactions, including utility bills, fines, fees, and online purchases, are made easier by e-government services (Camilleri, 2020). The integration of electronic invoicing systems and secure payment gateways streamlines financial transactions, minimises documentation, and enhances revenue collection procedures (Taherdoost, 2023). Governments now use electronic (or "e-form") forms that citizens fill out and submit online in place of traditional paper-based forms. Because e-forms are frequently interactive, intuitive, and adaptable, government organisations may handle data more quickly, validate it, and automate operations. Open data efforts are among the e-government services offered by governments. These projects involve publishing datasets and information in machine-readable formats for public use and access (Marathi et al., 2023). To validate user identities and safeguard sensitive information during online interactions, e-government services use secure digital identity and authentication technologies including digital signatures, two-factor authentication (2FA), and biometrics (Ahmed & Ahmed, 2023). This ensures data security and privacy. Personalised services are frequently provided by e-government platforms, taking into account user profiles, preferences, and past interactions (Smorgunov, Popova, & Tropinova, 2020). The user experience, engagement, and happiness with government services are improved by personalised content, recommendations, and notifications (Silva & Canedo, 2024).

2.5.3.2 Initiatives for Open Data

Encouraging instances of public sector innovation are open data projects, which aim to provide machine-readable versions of government data to the general public (Hyland-Wood, 2018). By providing information about public finances, policies, services, and performance to individuals, researchers, corporations, and civil society organisations, open data projects foster accountability and government effectiveness (David, McNutt, & Justice, 2018). Stakeholders can keep an eye on government operations, keep tabs on spending, and hold politicians responsible for their actions thanks to easily accessible data (Qiao-Franco & Zhu, 2024). Because open data makes extensive, timely, and trustworthy data accessible, it enables governments to make evidence-based decisions and policies. Data sets provide insights, trends, and patterns that decision-makers can use to develop more intelligent and successful governance plans. Because it gives developers, startups, and enterprises a valuable resource to create new tools, services, and apps, open data fosters entrepreneurship and innovation (Jawad & Balázs, 2024). Data-driven solutions tackle societal issues, enhance public services, and promote job creation and economic growth in sectors like urban planning, healthcare, transportation, and education (Akter, Sultana, Gunasekaran, Bandara, & Miah, 2024).

2.5.3.3 Innovations in Healthcare

With an emphasis on enhancing healthcare outcomes, access, services, and efficiency within the public sector, healthcare innovations constitute a substantial subset of innovation in the public sector (Cinar, Simms, et al., 2024). The use of telemedicine and telehealth services, which allow for remote patient consultations, diagnosis, monitoring, and treatment, is one example of public sector innovation in the healthcare industry (Palozzi & Ranalli, 2023). These developments save healthcare costs, increase patient convenience and outcomes, and improve access to healthcare, particularly in

underserved and rural areas (Olowoyo et al., 2024). Implementing electronic health record (EHR) systems and digitising patient health data, medical histories, treatments, and prescriptions are examples of public sector healthcare innovation (Mahajan, 2022). Electronic Health Records (EHRs) facilitate data-driven decision-making, lower medical errors, increase patient safety, and ensure continuity of care. Health information exchange (HIE) platforms, which enable the safe sharing of patient data across healthcare practitioners, hospitals, clinics, and public health organisations, are examples of advances in the public sector healthcare space. Public health surveillance, population health management, interoperability, and care coordination are all enhanced by HIE (Savino & Latifi, 2019). Innovation in the public health sector includes wearable technology, IoT-enabled healthcare solutions, and remote monitoring devices that measure health parameters, activities, and vital signs of patients (Indrakumari, Poongodi, Suresh, & Balamurugan, 2020). Proactive healthcare management, early intervention, individualised treatment plans, and patient empowerment in the management of long-term illnesses are made possible by these technologies (Margam, 2024). Healthcare innovation in the public sector makes use of AI algorithms, machine learning, and data analytics to forecast health outcomes, detect trends in vast datasets, and optimise the delivery of healthcare (Rehman, Naz, & Razzak, 2022). AI-powered solutions enhance healthcare decision-making, automate administrative chores, personalise treatments, and increase diagnostic accuracy (Parsa et al., 2023). The creation of digital health platforms, mobile health apps, and patient portals are examples of public sector innovation in healthcare. These tools enable patients to manage prescriptions, schedule appointments, access health information, and engage in telemedicine consultations, all of which improve patient engagement and health literacy (Upadhyay & Gulati, 2023). Innovative approaches to healthcare in the public sector

are concentrated on managing chronic diseases, promoting health, implementing preventative care plans, and managing population health (Sherr et al., 2013). These developments aim to improve population-level health outcomes, lessen healthcare inequities, and encourage community wellness and preventative practices (Rechis, Oestman, Walsh Jr, Love, & Hawk, 2023).

2.5.3.4 Social Innovation

A subset of public sector innovation known as "social innovation" is concentrated on resolving social issues, encouraging social inclusion, and enhancing the quality of life for both individuals and communities (dos Santos Figueiredo, Prim, & Dandolini, 2022). In the public sector, social innovation refers to the process of coming up with original answers to challenging problems related to social justice, the environment, healthcare disparities, homelessness, poverty, and inequality (Kerschbaumer, Crossett, Halaus, & Costa, 2024). The aforementioned developments are designed to enhance the standard of living for marginalised communities and foster societal unity. When it comes to co-creating solutions, public sector social innovation prioritises participatory techniques that involve individuals, communities, organisations, and other stakeholders (Anthony Jr, 2023). To fulfil local objectives and aspirations, stakeholders are empowered to identify needs, design interventions, and implement strategies through collaborative partnerships, co-design workshops, and community engagement activities (Robinson, Halford, & Gaura, 2022). In the public sector, social innovation fosters bottom-up strategies, grassroots movements, and community-based projects that enable communities to formulate their solutions, gather resources, and produce social capital (Wang, Weng, Shidujaman, & Ahmed, 2023). These programmes encourage community resilience, independence, and teamwork to solve problems together and bring about constructive social change. Social entrepreneurship and social companies

that blend business models with social missions are promoted by public sector social innovation (Nogales Muriel, 2024). These businesses address social issues, develop economic possibilities, and have a positive social impact on the areas they operate in by utilising creative thinking, market-based solutions, and sustainable practices. Policy innovation and regulatory reforms that promote social inclusion, equity, and human rights are examples of social innovation in the public sector (Giesecke & Schartinger, 2024). Governments adopt creative policies, initiatives, and rewards that encourage social mobility, lower obstacles, and foster an atmosphere that supports the growth of social innovation projects (Giesecke & Schartinger, 2024).

2.6 Geographical Issues in Public Sector Performance

The division of articles based on the geographic context of their subject is covered in this section. 32.5% of the publications in the literature review for this study had no geographical relationship, whereas the remaining 67.5% had one. Asia accounted for 53% of the regions with geographical links, followed by Europe (29%), and the Americas (12%). On the other hand, stories about the global level (11.2%) are the cause for alarm. For instance, writers like Stivers (2020), Hood (2002), Sørensen, and Torfing (2021), Moynihan (2008), Randma-Liiv (2023), Bouckaert and Halligan (2008), Van de Walle, and Hammerschmid, G. (Eds.). (2022) and Haque (2006) in their respective studies of public sector performance at the global level advocated for future researchers to turn their attention to public sector performance at the global level countries as there exists limited studies.

Table 2.1 ICTs and Public Sector Performance and their Geographical Regions

Topic	Autor	Geographical Region
The Impact of ICT on Public Sector Performance	Qureshi and. Shahbaz (2015)	Developing countries
ICT Adoption and Public Sector Performance in Sub-Saharan Africa	Aiyedun and Adebisi (2020)	Sub-Saharan Africa.
Assessing the Impact of ICT Investments on Public Sector Performance in the European Union	Coccia (2017)	European Union.
ICT and Public Sector Performance: A Case Study of Local Governments in Southeast Asia	by N. T. Le and T. Q. Hoang (2019)	Southeast Asia
The Role of ICT in Enhancing Public Sector Performance: Evidence from North America	Brown and Smith (2018)	Geographical focus: North America.
ICT Adoption and Public Sector Efficiency:	Sanchez and Garcia (2021)	Latin America

Empirical Evidence from Latin American Countries		
ICT Investments and Public Sector Performance: A Comparative Study of Middle Eastern Countries	Al-Hashmi and Al- Maashani (2016)	Middle East
The Influence of ICT on Public Sector Performance: Case Studies from East Asia	L. Chen and W. Zhang (2019)	East Asia.
ICT Adoption and Public Sector Performance in Oceania: A Comparative Analysis-	Thompson and Wilson (2017)	Oceania.
ICT and Public Sector Performance: Lessons from South Asia	Kumar and Gupta (2020)	South Asia.

2.7 Research Gaps and Directions for Future Research

The literature reviewed for this study reveals that a few gaps exist which need attention. First, extant research on public sector performance has largely concentrated on private firms where they measured performance mainly based on profitability levels where the

finding is being generalized towards the private sector ignoring the public sector (Siddiqui, 2019); (Siddiquee & Zafarullah, 2022), Koellinger (2008); Cataldo, Pino et al. (2020); Ghazinoory and Hashemi (2023). With high levels of corruption in public institutions (Siddiqui, 2019); (Siddiquee & Zafarullah, 2022), Koellinger (2008); Cataldo, Pino et al. (2020); Ghazinoory and Hashemi (2023) it becomes important to investigate how access to ICTs affects public sector performance using promoting accountability, government effectiveness and controlling of corruption. As a result, future studies can undertake studies to examine how both public and private sectors benefit from ICTs to improve their performance.

In addition, previous studies on ICTs and public sector performance have largely concentrated on cross-sectional data. For these studies, ICTs and public sector performance rely on cross-sectional data. As a result, future studies can undertake studies to examine how ICTs affect public sector performance using time series data. Also, these past studies afford a narrow view of ICTs and public sector performance as they have largely relied on data from single countries and were conducted in the developed country context thus limiting their findings to such contexts (Alhassan, Adam, Musah, & Wahaga, 2021; Mallick, 2021). This, therefore, calls for the research to examine this relationship at the global level where findings can be easily generalized to cover the global context.

Finally, the literature reviewed revealed that considerable studies conducted on public sector performance have relied on theories such as performance budgeting theory, new public management and theory of change (Nolte, Polzer, & Seiwald, 2021), However, some researchers have criticized these theories (performance budgeting theory) emphasis on quantitative metrics, which can overlook qualitative aspects of performance like creativity and innovation and therefore the need for future studies to

consider relying on other theories that appropriately explain public sector performance relating to accountability, government effectiveness and controlling of corruption. (P. Wang, Chen, & Lawler, 2024); (Kathuria & Lucianetti, 2024)

2.8 Summary of Conceptual Approaches to ICTs and Public Sector Performance

The table below is a summary of conceptual approaches to ICTs and public sector performance and provides a comprehensive overview of various theories and their findings related to the impact of Information and Communication Technologies (ICTs) on public sector performance. It includes contributions from multiple authors, each employing distinct theoretical frameworks such as the Technology Acceptance Model (TAM), Institutional Theory, Technological-Organizational-Environmental (TOE) framework, and others. The summarized findings reveal a generally positive relationship between ICTs and enhancements in public sector performance, encompassing aspects like efficiency, service delivery, government effectiveness and human resource quality across different regions and institutional contexts.

Table 2.2 Summary of Conceptual Approaches to ICTs and Public Sector Performance

Author(s)	Theory	Findings
All Share et al. (2019)	TAM	The research found a positive relationship between e-government use and public sector performance in Saudi Arabia's Ministry of Interior.
Githinji and Kinyua (2018)	Institutional Theory	The study suggests that differences in institutional contexts influence the

		effectiveness of e-government initiatives on public sector performance.
Alhassan, Adam, Musah, and Wahaga (2021)	TOE	ICT adoption influences HR quality but not public sector performance directly. However, HR quality was found to positively influence public sector performance.
Heeks and Bailur (2019)	Modernization Theory and the Digital Divide Theory	There is a positive relationship between ICTs and public sector performance globally.
Ajayi and Adesina (2017)	Resource-Based View (RBV)	The study finds a positive correlation between the quality of government websites and public sector performance indicators.
Boateng and Abdulai (2018)	Diffusion of Innovations theory	The research shows that e-government adoption positively influences public sector performance, particularly in terms of efficiency and service delivery.
Matei and Matei (2016)	Institutional Theory	The authors find a significant positive impact of ICT investments on public sector

		efficiency and service delivery in EU member states.
Obijiofor and Ugwu (2019)	Technological Determinism theory	The study suggests that mobile technologies can enhance transparency, accountability, and service delivery in the public sector of Sub-Saharan African countries.
Ahmad and Ismail (2018)	Information Systems Success Model (ISSM)	The research indicates a positive relationship between e-government adoption and improved public sector performance metrics among local government authorities in Malaysia.
Al-Debei and Avison (2018)	Social Influence Theory and Information Processing Theory	Effective utilization of social media platforms can lead to improved communication, and citizen engagement, and ultimately enhance public sector performance outcomes.

Source Authors Construct

2.8.1 Technology Acceptance Model (TAM)

Initially formulated by (Davis, Bagozzi, and Warshaw, 1989), the Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) has significant implications and applications in the public sector, particularly in understanding how

accounting professionals adopt and use information technology (IT) tools and systems (Jackson & Allen, 2024). TAM's core concepts of perceived usefulness (PU) and perceived ease of use (PEOU) are particularly relevant in the public sector context, where the adoption of new technologies can greatly impact efficiency, accuracy, and decision-making processes (Masadeh & El-Haggar, 2024). TAM is instrumental in studying the adoption of Accounting Information Systems (AIS) within organizations. Accounting professionals' perceptions of the usefulness of AIS in improving financial reporting, data analysis, and decision support play a crucial role in their acceptance and utilization of these systems (Ramayana et al., 2023). Factors such as the ability of AIS to streamline processes, reduce manual errors, and provide real-time financial insights contribute to perceived usefulness.

With the increasing adoption of cloud-based accounting software, TAM helps in understanding how public sectors perceive the ease of use and usefulness of these platforms (Baiod & Hussain, 2024). Factors such as accessibility, data security, scalability, and collaboration capabilities influence their adoption decisions (Hiran & Dadhich, 2024). TAM frameworks tailored to cloud technologies can guide organizations in implementing and optimizing cloud accounting solutions. TAM extends to the adoption of data analytics and business intelligence tools in accounting practices (Mohammed, Al-Okaily, Qasim, & Al-Majali, 2024). Professionals in the public sector's perceptions of the usefulness of these tools in financial forecasting, risk management, fraud detection, and performance analysis drive their adoption. PEOU factors such as user interface intuitiveness, data integration, and training resources also influence acceptance levels (Yang, Blount, & Amrollahi, 2024).

Mobile accounting applications are becoming increasingly popular, allowing public sectors to access financial data and perform tasks on the go. TAM helps in assessing

how accounting professionals in the public perceive the usefulness and ease of use of these mobile apps (Kallmuenzer, Mikhaylov, Chelaru, & Czakon, 2024). Factors like real-time updates, data synchronization, and security features impact adoption rates among accounting professionals in the public sector. Innovations like blockchain technology and cryptocurrencies are transforming public sector practices (Rot, Sobińska, Hernes, & Franczyk, 2020). TAM frameworks can be adapted to study how the public sector perceives the usefulness and ease of use of blockchain for secure transactions, audit trails, and cryptocurrency management. Factors such as transparency, immutability, and compliance features influence adoption decisions (Abad-Segura, Infante-Moro, González-Zamar, & López-Meneses, 2024).

2.8.2 Institutional Theory

Institutional Theory is a prominent sociological framework that has found widespread application in various disciplines, including organizational studies, economics, and public administration (Thurik et al., 2024). Its core premise revolves around the idea that institutions—both formal (laws, regulations, norms) and informal (cultural beliefs, values, traditions)—shape individual and organizational behaviour. In the context of public sector performance and ICTs (Information and Communication Technologies), institutional theory offers valuable insights into how institutional factors influence the adoption, implementation, and outcomes of ICT initiatives (AbdulKareem et al., 2024).

Institutional theory is a cornerstone in understanding the behaviour of organizations within their societal contexts. At its core, it posits those institutions—comprising formal rules, regulations, and informal norms—shape and influence organizational behaviour and decision-making (Nir Kshetri, 2024). This theory has been extensively applied across various disciplines, including accounting, sociology, economics, management, and public administration, shedding light on how institutions impact

organizational strategies, practices, and outcomes (Adam, 2023). Institutional Theory is the notion of isomorphism, which refers to the tendency of organizations to mimic or conform to prevailing institutional norms and practices (Rudko, Bashirpour Bonab, Fedele, & Formisano, 2024). This transformation occurs through three main mechanisms: coercive pressures, mimetic pressures, and normative pressures. Coercive pressures are exerted by external forces such as government regulations, legal frameworks, and industry standards (Nawaz & Guribie, 2024). Organizations often comply with these pressures to avoid sanctions, gain legitimacy, or align with industry expectations. For example, public sector organizations may adopt specific ICT standards or cybersecurity protocols mandated by regulatory bodies to ensure compliance and legitimacy (Shandilya, Datta, Kartik, & Nagar, 2024). Mimetic pressures, on the other hand, stem from organizations imitating successful practices or strategies observed in other similar organizations. This imitation is often driven by a desire to emulate success, reduce uncertainty, or learn from industry leaders. In the context of ICT adoption, public sector organizations may mimic the technological strategies of peer agencies or benchmark against industry best practices to improve efficiency, effectiveness, and service delivery (Alsharari, 2020). For instance, observing successful e-government initiatives in other countries may prompt a government agency to replicate similar digital platforms or citizen engagement strategies (Goloshchapova, Skornichenko, & Turgaeva, 2022). Normative pressures, the third mechanism of isomorphism, arise from social expectations, cultural values, and professional norms within an industry or society. Organizations conform to these norms to gain social acceptance, legitimacy, and approval from stakeholders. In the public sector, normative pressures may influence ICT adoption decisions based on societal expectations for government effectiveness, accountability, and citizen-centric

services (Bezzina et al., 2021). Public agencies prioritize digital transformation initiatives that enhance data transparency, promote open government practices, and improve citizen engagement to align with normative expectations and fulfil their public service mandate (Luna, Picazo-Vela, Buyannemekh, & Luna-Reyes, 2024).

Institutional theory also emphasizes the role of institutional entrepreneurs and change agents in driving institutional change and innovation within organizations. These individuals challenge existing norms, advocate for new practices or technologies, and mobilize support for change initiatives (Salonen, Suomalainen, & Pyysiäinen, 2024). In the context of ICT access in the public sector, institutional entrepreneurs may champion digital transformation projects, advocate for investment in emerging technologies, and promote a culture of innovation and experimentation (Schiuma, Santarsiero, Carlucci, & Jarrar, 2024). Their efforts can catalyze organizational adaptation, foster technological advancements, and improve public sector performance. Institutional theory underscores the concept of institutional logics, which represent the underlying beliefs, values, and assumptions that guide decision-making within institutions (S. David, Zinica, Bărbuță-Mișu, Savga, & Virlanuta, 2024). Different institutional logic may coexist within an organization or across sectors, leading to tensions, conflicts, or synergies in strategic choices and actions. For example, public sector organizations may navigate the tension between bureaucratic/logistical logic and digital/logical logic when implementing ICT initiatives (Ferry et al., 2024). Balancing traditional administrative processes with agile, data-driven decision-making requires reconciling conflicting institutional logic and adapting organizational structures, practices, and cultures accordingly (Fleury, Fleury, Oliveira, & Leao, 2024).

2.8.3 Resource Base View Theory

The Resource-Based View (RBV) theory, originally developed as a part of strategic management discourse, emphasizes the role of a firm's unique resources and capabilities in achieving and sustaining competitive advantage (Malhotra, Dandotiya, Shaiwalini, Khan, & Homechaudhuri, 2024). In the realm of the public sector, this perspective becomes instrumental in shaping how resources are allocated, evaluated, and reported (Keefer & Vlaicu, 2024). RBV asserts that firms must focus on resources that are valuable, rare, inimitable, and non-substitutable to secure a competitive edge, which influences accounting practices in several ways (Baah, Agyabeng-Mensah, Afum, & Lascano Armas, 2024). In the public sector, RBV particularly affects strategic management accounting, emphasizing the efficient allocation of resources to sustain long-term value creation (Alsharari, 2024). The public sector, under the guidance of RBV, is encouraged to prioritize investments that enhance the firm's strategic capabilities, such as advanced IT systems for financial reporting or specialized compliance management expertise (Bag et al., 2024). These practices not only help in managing costs effectively but also ensure that resources are utilized to maximize competitive advantages.

RBV underscores the importance of intangible assets such as intellectual property, organizational knowledge, and customer relationships, viewing them as critical strategic assets (Hat, Tan, Ngoc Vi, Phu, & Ting, 2024). The accounting treatment of these intangibles, from their valuation to their impact on financial statements, reflects their strategic importance. However, this also presents challenges in terms of reporting and government effectiveness, as accountants must balance the need for disclosure with the necessity to protect competitive information as highlighted by RBV's focus on the inimitability of resources (Hussinki, King, Dumay, & Steinhöfel, 2024). RBV also

extends its influence to internal controls and risk management within accounting. It advocates for robust internal controls that protect and enhance the firm's strategic resources (Ulupui, Zairin, Musyaffi, & Sutanti, 2024). The public sector plays a crucial role here, developing systems to mitigate risks that could potentially devalue these unique resources, including comprehensive cybersecurity measures and compliance protocols to address legal and operational risks (Usama, Ullah, & Sajid, 2024).

Moreover, the theory encourages a strategic approach to risk assessment, urging the public sector to focus on risks that could undermine the firm's unique resources and capabilities. This strategic approach is further reflected in how accountants conduct cost-benefit analyses for potential investments, evaluating not just the financial implications but also considering the strategic value of the resources involved (Gonzalez-Urango, Mu, Ujwary-Gil, & Florek-Paszkowska, 2024). In academic circles, RBV has driven empirical research within accounting to investigate how specific accounting practices or capabilities contribute to firm performance. This research often employs methodologies such as case studies and longitudinal data analysis to explore the dynamic relationship between resource management and firm outcomes, providing deeper insights into the strategic role of accounting in enhancing competitive advantage (Solovida & Latan, 2021). The Resource-Based View integrates deeply with accounting, transforming traditional practices into strategic activities that align closely with the firm's overarching goals of maintaining and enhancing competitive advantage through effective resource management. This perspective not only highlights the strategic importance of accounting practices but also positions accountants as key players in strategic decision-making processes within firms (G. Malhotra et al., 2024).

2.8.4 Technology-Organization Environment (TOE) Framework (TOE)

Technology-Organization Environment (TOE) framework (DePietro, Wiarda, & Fleischer, 1990). The framework highlights three (3) dimensions of a firm's context that influence the process through which the firm adopts and implements technological innovations. The Technology-Organization-Environment (TOE) framework is a useful theoretical model for understanding how organizations adopt and implement technology, taking into account three primary elements: technological context, organizational context, and environmental context (Lin & Chen, 2023). In the public sector, the TOE framework helps to elucidate the factors influencing the adoption of new accounting technologies, such as advanced software for financial reporting, blockchain for government effectiveness in transactions, or artificial intelligence for audit processes (Baiod & Hussain, 2024).

Technologically, public sectors are often influenced by the availability of new software and tools that can enhance accuracy, speed, and compliance with regulatory standards. These technologies promise greater efficiency and better analytical capabilities, making their adoption crucial for competitive advantage (Wijesooriya & Basnayake, 2024). However, the organizational context, which includes the firm's size, management structure, and internal expertise, also significantly impacts this adoption. Larger firms may have the resources to invest in cutting-edge technology and the specialized staff to implement it, while smaller firms might struggle with resource constraints (Clemente-Almendros, Nicoara-Popescu, & Pastor-Sanz, 2024).

Furthermore, the environmental context—comprising industry standards, competition, and regulatory requirements—also plays a critical role. For example, if industry standards favour government effectiveness and real-time reporting, firms are more likely to adopt technologies that can support these requirements. Similarly, competitive

pressures can drive technology adoption as firms strive to offer superior services or more detailed and timely data to their clients (Khan, Chang, & Bibi, 2024). In this way, the TOE framework provides a comprehensive lens through which the adoption of technology in the public sector can be analyzed. It highlights the interplay between the capabilities of available technology, the readiness and structure of the organization, and the external pressures and opportunities presented by the market and regulatory environment (Neumann, Guirguis, & Steiner, 2024). This holistic view is essential for understanding why some public sectors quickly embrace technological innovations while others are slower to adapt, reflecting the differential capacities and strategic orientations shaped by these three contextual dimensions (Blocker, Cannon, & Zhang, 2024).

2.8.5 Information Systems Success Model

A key framework for understanding how successful an accounting information system (AIS) is within an organization is the DeLone and McLean Information Systems Success Model. This model looks at the interplay between various factors that contribute to an AIS's overall effectiveness. The base of the triangle represents the system's core qualities: system quality (ease of use, reliability), information quality (accuracy, relevance), and service quality (training, support) (Al-Okaily, 2024). These influence how much users interact with the system (system use). If users find the system easy to navigate and provide them with accurate, relevant information, they're more likely to use it regularly. This usage then feeds into user satisfaction (Stahl & Eke, 2024). If the system meets their needs and helps them complete tasks efficiently, users will be happy. Finally, user satisfaction and system use together contribute to the net benefits the AIS brings to the organization. This can include improved financial decision-making, reduced errors, and increased efficiency (Al-Okaily, 2024).

2.9 Accountability Theory

This study is based on the foundation's accountability theory, as suggested by Michael Power in the early 1990s, to examine the effects of ICTs on public sector performance. Accountability theory refers to the importance of government effectiveness and justification for financial reporting. Accountability theory is a powerful tool when examining the relationship between Information and Communication Technologies (ICTs) and public sector performance

In today's digital age, Information and Communication Technologies (ICTs) are transforming the way public sectors operate. From streamlining service delivery to facilitating citizen engagement, these technologies hold immense potential to improve public sector performance. However, alongside harnessing this potential lies the crucial aspect of ensuring accountability. This is where accountability theory becomes a powerful lens for examining the relationship between ICTs and public sector performance. Accountability theory emphasizes the importance of accountability and government effectiveness, where citizens can readily access information about government operations. ICTs play a pivotal role in achieving this by enabling online platforms that house data, budgets, and performance metrics. This open access empowers citizens to hold public officials accountable for decisions made and resources allocated. Imagine a user-friendly website where citizens can easily track how their tax dollars are being spent on specific projects. Such government effectiveness fosters public trust, a vital component of a healthy democracy. Citizens are more likely to cooperate with and support government initiatives when they understand the rationale behind them. Conversely, a lack of government effectiveness breeds suspicion and hinders public trust, ultimately undermining public sector performance.

Accountability theory highlights the need for justification of actions. In the context of public services, this translates to demonstrating that resources are being utilized effectively to achieve desired outcomes. ICTs offer a potent tool for creating robust performance monitoring systems. By collecting and analyzing data on service delivery times, resource utilization, and citizen satisfaction, policymakers gain valuable insights. This data can be used to identify areas where services are lagging or resources are being misallocated. Take, for instance, a system that tracks response times to citizen complaints. Analyzing this data helps identify bottlenecks in service delivery and allows for targeted interventions to improve efficiency. This data-driven approach to performance monitoring aligns perfectly with accountability theory's emphasis on demonstrating the effectiveness of actions taken.

Accountability theory goes beyond mere top-down structures. It recognizes the importance of stakeholders having a voice. ICTs can empower citizens to become active participants in holding governments accountable. Imagine an online platform where citizens can submit complaints, track the progress of projects they care about, and even participate in decision-making processes through forums or surveys. Such platforms create a two-way communication loop that strengthens accountability. Citizens no longer have to rely solely on traditional media or sporadic town halls to voice their concerns. They have a direct channel of communication with their representatives, fostering a sense of ownership over public services. Additionally, by being able to track progress on projects, citizens can hold officials accountable for delivering on their promises. By applying the principles of accountability theory, governments can leverage ICTs to promote accountability, government effectiveness, efficiency, and reduction of corruption in the public sector. Open access to information empowers citizens, data-driven performance monitoring ensures efficiency and citizen

engagement strengthens the link between the government and the people it serves. Even though previous research has applied the theory in considerable areas in the accounting domain, there exists a dearth of studies that have adopted and applied the accountability theory in the area of ICTs and public sector performance research. Considerable public sector performance studies have largely adopted theories such as the Technology Acceptance Model (TAM), Technology, Organisation, Environment (TOE), Institutional Theory, Research Base View (RBV), and Information Systems Success Model (ISSM). Though the relevance of these theories in the accounting domain cannot be underplayed, some researchers have criticized these theories (eg institutional theory) often focusing on how organizations mimic each other's practices to gain legitimacy (transformation). Researchers argue institutional theory does not fully capture the complex ways public sector organizations adopt and use ICTs. Also, some researchers have criticized this theory (technology organization and environment) primarily focuses on internal factors within the organization and the immediate environment. It might not fully capture broader societal or political influences that can significantly impact ICT adoption and public sector performance. Therefore, the need for future studies to adopt other theories that appropriately explain ICTs and public sector performance about promoting accountability, government effectiveness and controlling corruption.

2.10 Hypotheses Development

2.10.1 ICT Access and Government ICT Use.

ICT access is the availability and reach of ICTs, such as computers, smartphones, and the Internet, which are referred to as ICT access. This is consistent with the framework's technology component of the TOE framework (Hart, 2023). Thus, access to ICTs makes it possible for governments to embrace and apply new technologies. The level of access

either makes usage easier or difficult (Adam & Alhassan, 2021; Rana, Greenwood, & Henderson, 2022). Access to ICT is necessary for many elements of modern life, such as commerce, education, communication, and information access (Hussain et al., 2023). According to (Hossain, 2022), (Marshall et al., 2023) and (Freeman, Park, & Middleton, 2020), ICT access encompasses elements such as infrastructure, digital literacy, devices, connectivity, affordability, accessibility and availability of content services.

Prior studies have examined the effect of ICT access on government ICT use. For example, in the study of (Marshall et al., 2023), they found that ICT access plays an important role in encouraging government ICT use. Specifically, access to ICT such as personal computers, the Internet, and mobile devices is of critical essence in promoting government ICT use. This notwithstanding, the effects of ICT access on government ICT use remain under-examined, especially in the context of the public sector performance. It is in this line that some studies Keegan (2023); Ndoya, Okere, Laure Belomo, & Atangana (2023); Nguyen, Dinh, Tran Ngoc, & Duong Thi Thuy (2022); Behera, Haldar, & Sethi, (2023); Wirajing & Nchofoung (2023) have identified ICT as a driver to reducing corruption. Since ICT access is the capacity and chance for people, groups, or communities to use and profit from digital technologies (Hart, 2023), government ICT use will play a key role in ensuring accountability and the attainment of organizational objectives. Furthermore, government ICT use ensures accountability (Shenkoya, 2023), and effective government ICT use may be realized if the government have access to ICT. This results in the first hypothesis;

H₁: The level of ICT access in a country is positively associated with its government ICT use.

2.10.2 ICT Access and Individual ICT Use

By encouraging cooperation and communication between and among agencies, businesses, and citizens, ICT access has been found to improve individual effectiveness, government effectiveness, accountability, and performance (Ibrahimi, Virkus et al. 2023, Afees 2023, Sofyani, Riyadh et al. 2020, Madan and Ashok 2023). For instance, Madan and Ashok (2023) contend that individual values like accountability, openness, efficacy, and justice are transformed in multiple ways when ICT access is available. Consequently, ICT access fosters accountability and reduces bureaucracy, which improves individual ICT use (Madan and Ashok, 2023). Individual ICT use may improve as a result of keeping officials on their toes and ensuring an efficient and transparent sector (Adam, 2020; Madan and Ashok, 2023).

According to a wealth of research, having access to ICT can significantly and favorably impact how each person uses it (Alderete, 2017; Jamtsho and Bullen, 2007; Kituyi-Kwake and Adigun, 2008; Makinde et al., 2019). The right use of ICTs requires adequate access to them (Makinde et al., 2019). There are fewer incentives for individual ICT use the weaker the conditions are for ICT access (e.g., higher device prices, higher mobile charges, lack of internet access, higher broadband subscribers). According to Kituyi-Kwake and Adigun (2008), the high cost of internet connectivity, the high cost of phones, and computer illiteracy prevent Kenyan rural women from using ICTs. However, the researchers recommended that governments and other relevant organizations work to inform the public about the use of ICTs and offer reasonably priced access to a variety of ICTs.

In addition, bridging the digital divide in ICT access between industrialized and developing nations is imperative. The high expense of obtaining access to ICTs has been a barrier to their use in underdeveloped nations (Jamtsho and Bullen, 2007).

People can concurrently access and produce vast amounts of knowledge when they use ICTs.

People who own laptops, cellphones, or other mobile devices can use them to browse the internet, participate in online classes, share their experiences, and conduct complex data analysis using cloud tools (Brynjolfsson and McAfee, 2014). The cycle of teaching and learning will be improved by computer technology and internet connectivity, which will also give tutors and students a variety of access points to knowledge and instructional resources (Hossain and Sormunen, 2019). Businesses would also profit from affordable access to ICTs since it will enable them to offer customized products and services to their clientele (Adam et al., 2020; Al-Somali et al., 2011). By using ICTs, people will also find it easy to communicate with their fellow citizens (Srivastava and Teo, 2007; Adam, 2020). This brings up the second hypothesis:

H₂: The level of ICT access in a country is positively associated with individuals ICT use

2.10.3 Government ICT Use and Public Sector Performance

The use of government use of ICTs as the organisational context is justified by the study of (Al Sayegh, Ahmad, AlFaqeeh, & Singh, 2023) that similarly represented government ICT use as an organizational construct in their investigation of factors affecting e-government adoption in the UAE public sector organisation. Formal organisations with set structures, procedures, and objectives are represented by government departments and agencies. The use of ICT in government is a phenomenon that occurs at the organisational level and has an impact on communication, decision-making, and operations. ICTs are also frequently adopted by governments to increase organisational efficacy and efficiency. Organizational effects result from ICT adoption and usage in the public sector. Governments' use of ICTs raises concerns like workflow

redesign, managerial support, organisational change, and capacity building—all of which fit within the TOE framework's organisational context.

Without access to traditional mainstream information sources, a nation that does not adopt and use ICTs will find itself digitally isolated (Ng, Lim et al. 2023, Panagiotopoulos, Protogerou et al. 2023, Alhassan and Adam 2021, Velicu, Barbovski et al. 2022). Previous research has shown that public sector performance depends on government ICT use. For example, the findings of (Panagiotopoulos, Protogerou, & Caloghirou, 2023), study showed that when governments have high standards, access to technology, and skill sets, these factors encourage them to embrace ICTs, which in turn can improve public sector performance. Similarly, research by (Velicu, Barbovski, & Rotaru, 2022) demonstrated that government officials may want to learn how to use ICT devices if they have access to them, which could also improve public sector performance. In their study on government ICT use and social inequality in developing nations, (Lechman, 2023) discovered that one of the main obstacles preventing women from being digitally excluded is their ability to use ICTs. Although there is a body of literature that primarily looks at how government ICT usage affects public sector performance, the majority of these studies were conducted in a single nation, which made it challenging to generalize the findings to other nations. As a result, we expand on earlier research to offer a more comprehensive understanding of how government ICT use affects public sector performance globally. Therefore, the hypothesis.

H₃: Government ICT use in a country is positively associated with its public sector performance

2.10.4 Individual ICT Use and Public Sector Performance

Camngca (2024); AbdulKareem (2024); Febriyanti (2023); Meru (2022); and Zhu (2024) all did studies on how individuals use ICT and how well it influences public sectors. Using ICT, like digital tools for communication, teamwork, and job management, can help public sector workers be more efficient and get more done. ICT speeds up the sharing of information, streamlines routines, and automates processes, which lowers the amount of work that needs to be done by humans (Berg, 2021). ICT gives people who work in the public sector the tools they need to provide better services that are more responsive to users. Digital platforms and online services can make things easier to get to, faster, and quicker, which can make people happier and more trusting in their daily lives. People who use ICT on their own can easily access data and analytics tools, which lets the public sector make decisions based on facts [Raihan, 2024]. Policymakers and administrators can find trends, keep an eye on performance, and better allocate resources by using data insights. This leads to better policy results and service delivery. People using ICT on their own helps the public sector be more open to new ideas and work together. Through digital platforms and communication tools, employees can collaborate across departments, share knowledge and best practices, and co-create solutions to complex problems (Sanabria-Z, 2024). This environment for working together promotes creativity, efficiency, and constant change in the way the public sector does its job. Individual activities can be more open and accountable with the help of ICT. Digital platforms for public reporting, open data efforts, and e-government services make decision-making more open and let people hold public officials responsible for their actions (Villao, 2024)

H₄: Individual ICT use in a country is positively associated with its public sector performance

2.10.5 ICT Access and Public Sector Performance

By encouraging cooperation and communication between and among agencies, businesses, and citizens, ICT access has been found to improve public sector effectiveness, accountability, controlling of corruption and performance (Ibrahim, et al. 2023, Afees 2023, Sofyani, Riyadh et al. 2020, Madan & Ashok 2023). For instance, Madan and Ashok (2023) contend that public values like accountability, openness, efficacy, and justice are transformed in multiple ways when ICT access is available in the public sector. Consequently, ICT access fosters accountability and reduces bureaucracy, which improves public sector performance (Madan and Ashok, 2023). Public sector performance may improve as a result of keeping officials on their toes and ensuring an efficient and transparent sector (Adam, 2020; Madan and Ashok, 2023). This brings up the fifth hypothesis:

H₅: The level of ICT access in a country is positively associated with its public sector performance

2.10.6 The mediating role of government and individual ICT use

The mediating role of government and individual ICT use on public sector performance is an intriguing area of research that delves into the complex interplay between information and communication technology (ICT), government policies, individual behaviours, and their collective impact on the performance of public sector organizations. Government policies and interventions play a crucial role in shaping the ICT landscape within the public sector. For instance, policies related to digital governance, data security, interoperability standards, and ICT infrastructure investments can significantly impact the access and utilization of ICT tools and systems in government agencies. A study by Zafar et al. (2021) highlighted that government support and investment in ICT infrastructure positively influence the efficiency and

effectiveness of public sector services, leading to improved performance outcomes. However, the impact of government policies on public sector performance through ICT is mediated by individual ICT use within government organizations. Individual behaviours, skills, and attitudes toward ICT access and utilization play a vital role in determining the actual benefits derived from ICT investments. Research by Dwivedi et al. (2020) emphasized the importance of individual capabilities and digital skills in leveraging ICT to enhance public service delivery and organizational performance. Moreover, the mediating role of government and individual ICT use is influenced by contextual factors such as organizational culture, leadership support, and change management practices. A study by Roed and Hagen (2022) emphasized the need for effective change management strategies and leadership commitment to facilitate the successful implementation and utilization of ICT in the public sector, ultimately impacting public sector performance. This brings up the last hypothesis:

H₆: The mediating role of government and individual ICT use in a country is positively associated with its public sector performance

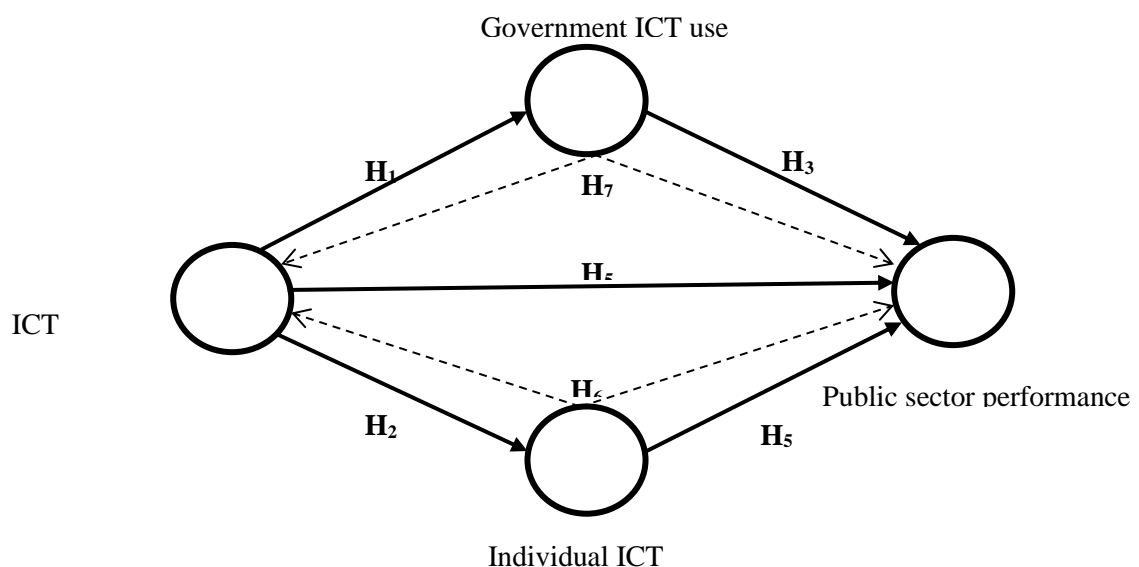


Figure 2.1 Conceptual Model of the Research

2.11 Chapter Summary

This chapter reviewed literature on ICTs, related concepts, public sector performance, advances in the public sector, accountability in the public sector, government effectiveness in the public sector and controlling of corruption in the public sector, and innovation in the public sector. ICTs and public sector performance. In addition, the literature review found many study gaps in public sector performance research that remain unanswered. This chapter also discussed the research model that was adopted for this study. The study leaned on the foundations of the Accountability Theory to identify and examine the effects of ICTs on public sector performance in promoting accountability, government effectiveness and controlling corruption in the public sector at a global level. This theory was selected over theories such as institutional theory, resource's base view theory, technology acceptance model and technology organization environment because it aided the research to incorporate both functional and non-functional constructs in the research model. In addition, the theory supports studies in the field of accounting.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Accountability Theory was examined in the preceding chapter, which concentrated on the literature review theory and the creation of this study's hypotheses. In keeping with the research methodology perspective, this chapter looks at government efficacy, accountability, and using ICTs to combat corruption in the public sector globally. The study paradigm, research methodology, participant seating, data source, data, and data analysis approach are the main topics of discussion in this chapter.

3.2 Research Paradigm.

Kuhn (1970, p.175), defines a research paradigm as the "set of beliefs, values, and techniques which is shared by members of a scientific community and which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them". Three main paradigms have been developed over the years of research. These paradigms are Positivism, Interpretivism and Critical Realism (Mingers, 2004). **First**, according to the positivist paradigm, actual cases or events can be observed empirically and characterized or examined using a proper or logical framework. If theoretically based predictions are consistent with data obtained through sensory experience, then that criterion is used to evaluate the validity of a scientific theory (Leong, 2014). According to positivists, several researchers studying the same issue or phenomena will provide comparable results if they use the same statistical test and research methodology when looking at a sizable sample (Creswell, 2009b). According to Wahyuni (2012), positivists hold that generalizations can be used in a variety of circumstances.

The interpretivism paradigm maintains that social actors and people's views of reality shape it. In other words, interpretivism holds that through a variety of social interactions, people with diverse backgrounds, experiences, and presumptions contribute to the continual production of reality that exists in their larger social context (Wahyuni, 2012). To understand how different people interpret a phenomenon, interpretivists like to engage in conversation and interaction with the study participants. Because of this, they choose working with qualitative data that offers detailed explanations of social conceptions (Wahyuni, 2012).

Critical realism closes the gap between the interpretative ontology and positivist epistemology (Mingers, 2004). According to critical realism, there are some unobservable events that have an impact on the observable ones. In other words, people can only truly comprehend the social world if they make an effort to comprehend the systems that give rise to these kinds of unobservable events. This allows the researcher to distinguish between the occurrence and its cause, which is crucial in the experimental setting. Critical realism holds that although an experiment or study's conditions are created by the researcher (observable events), the underlying laws and mechanisms (unobservable events) are what drive the study's results (Sharpe and Bhaskar, 1976). After presenting an overview of the three primary paradigms in accounting research, this study primarily uses the Positivist paradigm as a framework. The goal of the study, which is to look at how ICTs affect public sector performance, justifies the researcher's selection of this kind of paradigm. The research establishes correlations between the independent variable and dependent variables, such as government, person, and ICT access and use. Contrary to other paradigms, positivism, according to Corbin and Strauss (2008), permits the researcher to manipulate reality by altering a single independent variable in order to find regularities and establish links between certain

elements or constructions. Furthermore, this study draws on a few hypotheses and attempts to examine the accountability theory in the context of ICTs and public sector performance through the analysis of data collected using Partial Least Squares - Structural Equation Modelling (PLS-SEM). According to Leong (2014), positivism helps researchers observe actual events experimentally and provide logical explanations. Moreover, positivism holds that a scientific theory's validity is determined by how well its theoretically based predictions agree with data that is observed with the senses (Leong, 2014).

3.3 Research Methods

A collection of protocols, instruments, and strategies for gathering and evaluating data is called a research method (Hunziker & Blankenagel, 2024). According to Azevedo et al. (2024), researchers often employ three primary types of research methodology. They consist of mixed, qualitative, and quantitative methods. According to Pilcher and Cortazzi (2023), quantitative methods are connected to the positivist paradigm, whereas qualitative approaches are tied to the interpretivist paradigm. This study used a cross-sectional survey with secondary data as its quantitative research approach.

3.4 Data Source

Consistent with prior studies in ICTs for development and public sector performance Adam et al., (2020); Dash, Singh, Panda, & Sharma (2023); Yu, Jin, Zhang, & Chong, (2023), this study utilized data from secondary sources for 131 countries across the globe. The data was drawn from two secondary sources (the 2022 NRI and Worldwide Governance Indicators 2022). The Network Readiness Index (NRI) 2022 provides data for 131 countries and Worldwide Governance Indicators (2022) provide data for 214 countries. The study utilized data from 131 countries by comparing two extensive

databases. This comparative analysis focused on variables that had corresponding measurement items across both reports. Countries that were not having data in both reports were deleted. By aligning these measurement items, the study ensured consistency and reliability in its findings. The meticulous alignment of measurement items across the two databases was crucial in achieving a coherent and meaningful analysis.

Due to the large number of countries used as well as resource and time constraints, it was not feasible for the researchers to collect primary data across global countries and thus, the use of these secondary data sources provided a reliable database for this study. The conceptual model (see Figure 1) comprises four (4) latent constructs, that is., ICT access Individual ICT use, Government ICT use and public sector performance. The measurement items for ICT access, Individual ICT use, and Government use of ICT were drawn from the NRI 2022, whilst the indicators for public sector performance were drawn from the Worldwide Governance Indicators 2022.

First, ICT access is measured by six (6) items that include, mobile tariffs, handset prices, FTTH/building Internet subscriptions, population covered by at least a 3G mobile network, International Internet bandwidth, and Internet access in schools., Government ICT use has four (4) indicators: government online services, publication and use of open data, government promotion of investment in emerging technologies, and R&D expenditure by governments and higher education. Individual ICT use is also measured by six (6) items that include Active Mobile Broadband Subscriptions Count, ICT skills in the education system, Use of virtual social networks, Tertiary enrollment, Adult literacy rate and AI talent concentration. Finally, the dependent construct, public sector performance is measured by three (3) indicators: control of corruption estimate, government effectiveness estimate, and voice and accountability estimate. According

to (Hair Jr, Hult, Ringle, & Sarstedt, 2016), the minimum sample size required for this study will be 10 times the construct with the highest number of reflective indicators. Given this, the construct with the highest number of indicators in Figure 1 is ICT access with 6 indicators, and as such, the minimum sample required for this study is $10 \times 6 = 60$. The use of 131 countries is considered sufficient as per (Hair et al., 2011; Peng & Lai, 2012). Table 1 presents a summary of the study's constructs and their respective measurement items.

Table 3.1. Summary of construct, indicators, and source

Constructs	Measurement indicators	Acronyms	Source
ICT Access	Mobile tariffs	ICTA1	
	Handset prices	ICTA2	
	FTTH/building Internet subscriptions	ICTA3	
	Population covered by at least a 3G mobile network	ICTA4	
	International Internet bandwidth	ICTA5	
	Internet access in schools	ICTA6	
Government	Government online services	ICTUG1	
ICT use	Publication and use of open data	ICTUG2	
	Government promotion of investment in emerging technologies	ICTUG3	NRI 2022

	R&D expenditure by governments and higher education	ICTUG4	
Individual ICT use	Active Mobile Broadband Subscriptions Count	ICTU1	
	ICT skills in the education system	ICTU2	
	Use of virtual social networks	ICTU3	
	Tertiary enrollment	ICTU4	
	Adult literacy rate	ICTU5	
	AI talent concentration	ICTU6	
Public Sector Performance	Control of Corruption: Estimate	PSP1	Worldwide Governance Indicators (2022)
	Government Effectiveness: Estimate	PSP2	
	Voice and Accountability: Estimate	PSP3	

3.5 Method of Data Analysis

3.5.1 Partial Least Square in Structure Equation Modelling.

Academic research has extensively embraced the multivariate data analysis method known as structural equation modeling (SEM) for the purpose of validating constructs and examining the interrelationships among them (Islam, Mofiz Uddin, & Rahman,

2024). SEM is “a class of approaches that aims to represent hypotheses about the means, variances, and covariances of observed data in terms of a smaller number of "structural" parameters defined by a hypothesized underlying model (Marrelec & Giron, 2024)". There are two primary methods for applying SEM. Specifically, Partial Least Squares SEM, which focuses on the study of variance and can be carried out using software programs like SmartPLS and ADANCO, and Covariance SEM (CB-SEM) utilizing software packages like Mplus, AMOS, LISREL, etc. (Hair, Risher, Sarstedt, and Ringle, 2019; Wong, 2019). This research used the PLS-SEM methodology. This was mostly due to the fact that PLS-SEM is a method to SEM that makes no assumptions on the distribution of data, in contrast to CB-SEM (Vinzi, Chin, Henseler, and Wang, 2010). In other words, PLS-SEM can be helpful in studies with a small sample size and a skewed distribution of data (Wong, 2011). The study's goal was to investigate the link between dependent and independent components utilizing effect size and predictive relevance, which CB-SEM cannot provide. For this reason, the researcher also chose to employ PLS-SEM (Astrachan, Patel, and Wanzanried, 2014).

Partial Least Squares- Structural Equation Modelling (PLS-SEM) with the help of SmartPLS version 3 was utilized for the analysis of the data. Unlike other approaches to SEM such as the Covariance Based SEM (CB-SEM), PLS-SEM is an approach to SEM with no data distribution assumptions (Vinzi, Chin, Henseler, & Wang, 2010). According to Hair, Risher, Sarstedt, and Ringle, (2019), when estimating complex models with several constructs, indicator variables, and structural linkages, PLS-SEM is a helpful technique. Furthermore, in research including mediator and moderator analysis, PLS-SEM is helpful (Hair, Ringle, & Sarstedt, 2011; Hair, Risher, Sarstedt, & Ringle, 2019). Additionally, PLS-SEM is a highly effective tool for mediating analysis, making it an appropriate choice for the study. The current research

investigated the mediating role of government use of ICT and individual use of ICT on the nexus between ICT access and public sector performance, thus demonstrating the need to use PLS-SEM (Hair, Risher, Sarstedt, & Ringle, 2019). Also, PLS-SEM is an excellent tool for secondary data analysis. This study utilizes secondary data, making SmartPLS-SEM an ideal choice due to its robust capabilities in handling such data. SmartPLS-SEM is particularly effective for analyzing complex relationships between variables, which is essential for our research (Khan et al., 2024).

3.5.2 Analysis Techniques

Examining the measurement models is the first step in analyzing or appraising PLS-SEM data. In essence, the evaluation or estimation of the measurement model helps the researcher make a comparison between the actual data gathered for the study and the theory that was chosen for it.

For formative and reflective constructs, different evaluation criteria apply (Hair, Risher, Sarstedt, and Ringle, 2019; Urbach and Ahlemann, 2010). Reflective constructs were included in this study, along with a test of the measuring model's validity and reliability prior to the structural model's evaluation. By making sure that the conventional decision rules were followed, this study evaluated the following: discriminant validity, convergent validity, internal consistency for dependability, and indicator reliability (Hair et al., 2019).

Evaluating the structural model came next, after the successful validation of the measurement model (Hair et al., 2019; Urbach and Ahlemann, 2010). The structural model was evaluated using the following five crucial procedures, as recommended by (Hair et al., 2019; Urbach and Ahlemann, 2010). This includes an evaluation of the structural model for collinearity problems, an evaluation of the relevance and significance of the relationships within the structural model, an evaluation of the

Goodness of Fit (GOF), an evaluation of the effect size (f-square), and an evaluation of the predictive relevance (q-square). A multi-group analysis was carried out to look at the impact of the moderating variable (ICT regulation) on the connection between the independent construct and the dependent construct after the measurement and structural model assessments were finished.

3.6 Chapter Summary

The research approach used to address the study's research questions was covered in this chapter. Along with the research method, sampling strategy, data source, and analysis approach, the selected research paradigm was also covered and supported.

CHAPTER FOUR

RESULT AND ANALYSIS

4.1 Introduction

This chapter describes the PLS-SEM evaluation and testing procedures for the suggested research model. There are three sections to this chapter. By guaranteeing the application of the standard decision criteria, the measurement model for indicator reliability, internal consistency for reliability, convergent validity, and discriminant validity is evaluated in the first section. The structural model's evaluation for multicollinearity concerns, goodness of fit, coefficient significance, effect magnitude, and predictive relevance are the main topics of the second section. The last section evaluated how the government and individual ICT use, as moderators, affected the link between the independent and dependent constructs.

4.2 Assessment of Measurement Model.

Analyzing the measurement models is the first stage in evaluating the outcomes in PLS-SEM. According to Hair, Hult, Ringle, and Sarstedt (2016), "model estimation delivers empirical measures of the relationships between the constructs and the indicators (measurement models) as well as between the constructs (structural model)". In essence, the evaluation or estimation of the measurement model aids in the researcher's comparison of the study's chosen theory. The appropriate standards for evaluating the measurement model are different for formative and reflective components (Hair, Risher, Sarstedt, and Ringle, 2019; Urbach and Ahlemann, 2010). Since every construct in this study was reflective, it is necessary to evaluate the validity and reliability of the measurement model before assessing the structural model. By making sure that the accepted choice rules are followed, this study assessed the indicator's dependability as

well as its internal consistency for reliability, convergent validity, and discriminatory validity (Hair et al., 2019; Urbach and Ahlemann, 2010).

4.2.1 Indicator Reliability

The degree to which "a variable or set of variables is consistent regarding what it intends to measure" is known as indicator reliability (Urbach and Ahlemann, 2010, p. 18). Reflective indicator loadings are tracked in order to verify the dependability of the indicators. It is advised to utilize indicator loadings of 0.708 and above, as these indicate that the construct or latent variable accounts for over 50% of the indicator's variation, guaranteeing the item's adequate reliability. (Hair and others, 2019). However, not every indication showed a significant amount of loading on the associated latent variables. As a consequence, they were removed from the model (Gefen and Straub, 2005). That is when the analysis was first run, some of the indicators were less than the minimum required threshold. Specifically, ICTU1, ICTU2, ICTA4, ICTA5, and GICTU4 were deleted as their indicator loading were 0.656, 0.312, 0.419, 0.628, and 0.659 respectively. The model was re-run using the PLS algorithm after ICTU1, ICTU2, ICTA4, ICTA5, and GICTU4 were deleted. On their respective latent variables, all other indicators loaded significantly. This indicated that the indicators met the minimal threshold condition. This indicates that the latent variables were accurately measured. The measurement and structural model were then assessed and evaluated once the results were extracted. After ICTU1, ICTU2, ICTA4, ICTA5, and GICTU4 were removed and the model was rerun using the PLS technique, Figure 4.1 displays the indicator loadings.

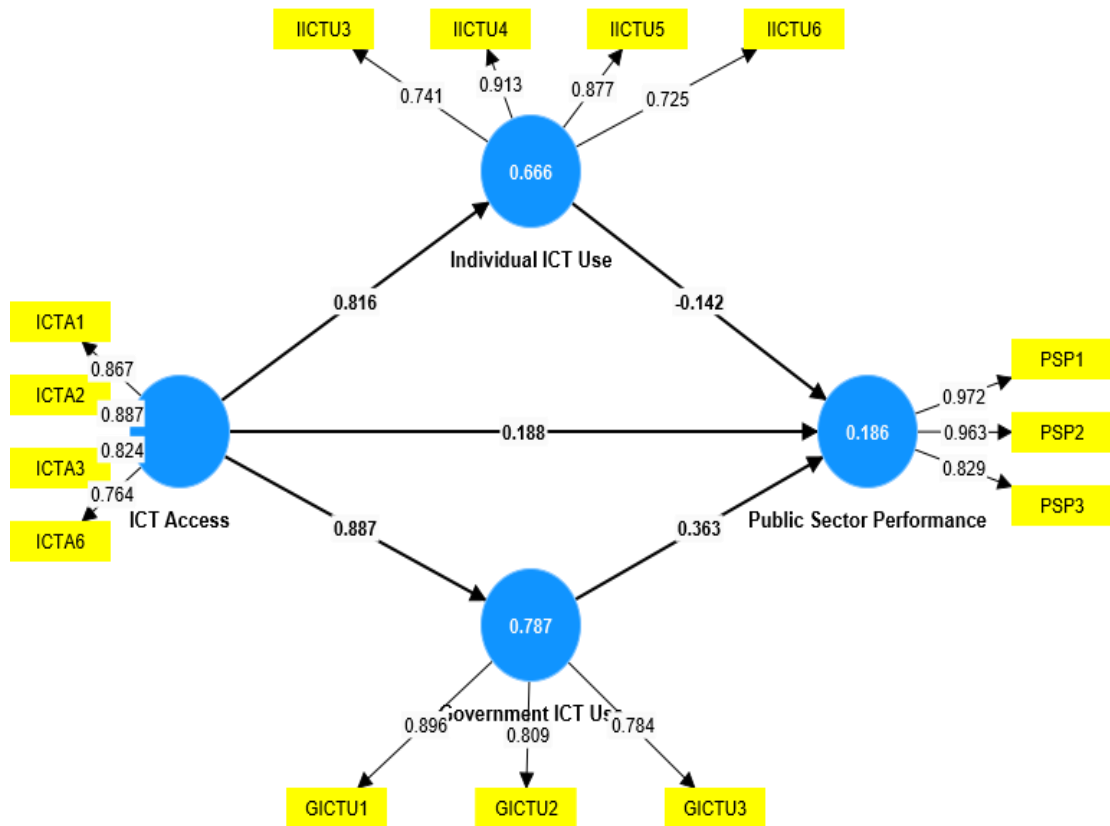


Figure 4.1 Results of PLS analysis

4.2.2 Internal Consistency Reliability

Internal consistency quality is tested using Cronbach's alpha after the indicator's accuracy has been determined. When a latent variable's alpha value is high, it suggests that all of the indicators' scores fall into the same range and have the same meaning (Cronbach, 1951). According to Nunnally (1978), Cronbach's alpha has a minimum threshold of 0.70. According to Table 4.1, every latent variable or construct had an Alpha value for Cronbach's that was greater than 0.70. Note that because the items are unweighted, Cronbach's alpha has been questioned by researchers for showing lower values and being a less accurate measure of dependability (Hair et al., 2019; Urbach and Ahlemann, 2010). Because of this, a different metric for indication dependability was proposed. That is Joreskog's (1971) composite reliability.

Joreskog (1971) In order to overcome the shortcomings of Cronbach's alpha, composite reliability was developed (Urbach and Ahlemann, 2010). As a more accurate estimate of indicator reliability than Cronbach's alpha, composite reliability requires that each indication has a unique loading (Henseler, Ringle, and Sinkovics, 2009). (Chin, 1998). Higher values correspond to higher degrees of dependability; for example, reliability values ranging from 0.60 to 0.70 are deemed "acceptable to exploratory research". According to Diamantopoulos, Sarstedt, Fuchs, Wilczynski, and Kaiser (2012), values 0.95 and above are considered problematic as they indicate that the items are more than what is required, which lowers the construct reliability. Moreover, values between the ranges of 0.70 and 0.90 indicate "satisfactory to good." As shown in Table 4.1, the composite dependability values from the results vary from 0.870 to 0.946, indicating "satisfactory" to "good."

Rho_A is regarded as an additional measure of consistency dependability in addition to composite reliability (Dijkstra and Henseler, 2015). Values of 0.70 for Rho_A are advised. As seen in Table 4.1, every latent variable has a Rho_A value greater than 0.70.

Table 4.1 Construct Reliability

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Government ICT Use	0.775	0.797	0.870	0.690
ICT Access	0.857	0.868	0.903	0.700
Individual ICT Use	0.832	0.854	0.889	0.669
Public Sector Performance	0.916	0.901	0.946	0.853

4.2.3 Convergent Validity

The investigation proceeded to examine each construct's convergent validity after assessing the internal consistency reliability. The "degree to which individual items reflecting a construct converge in comparison to items measuring different constructs" is what is meant by convergent validity (Urbach & Ahlemann, 2010 p. 19). Convergent validity is evaluated using the Average Variance Extracted (AVE) criterion (Fornell and Larcker, 1981). Each indication loading on a build must be squared in order to find the mean value, which is needed to calculate the AVE. AVE has a cutoff of 0.50 (Hair et al., 2019). This indicates sufficient convergent validity because the latent component or construct accounts for at least 50% of the variability of its elements (Hair et al., 2019; Urbach and Ahlemann, 2010). Table 4.1 demonstrates that sufficient convergent validity was attained because AVE values are higher than the cutoff point of 0.50.

4.2.4 Validity by Discrimination

The assessment of discriminant validity is the fourth phase. Discriminant validity is the "degree to which a construct is empirically distinct from other constructs in the structural model," according to Hair et al. (2019, p. 9). To ascertain or assess discriminant validity in PLS-SEM, two measures are frequently utilized. The cross-loading that arises from combining or comparing each latent variable score with all other items is the first computation (Chin, 1998).

It can be generalized that the indicators of the latent variable or construct are discriminant of each other when each indicator loads higher for its construct than for any other construct and each construct or latent variable loads greatest with its indicators or assigned items. In other words, they cannot be substituted. Given that the latent variables load more on their assigned constructions than any other construct (s), Table 4.2 suggests that they are discriminant of one another.

Table 4.2 Indicator Item Cross Loading

Measurement items	Government ICT Use	ICT Access	Individual ICT Use	Public Sector Performance
GICTU1	0.896	0.873	0.752	0.369
GICTU2	0.809	0.654	0.541	0.335
GICTU3	0.784	0.660	0.607	0.344
ICTA1	0.872	0.894	0.745	0.323
ICTA2	0.738	0.887	0.706	0.340
ICTA3	0.713	0.824	0.719	0.366
ICTA6	0.620	0.764	0.539	0.288
IICTU3	0.681	0.652	0.741	0.361
IICTU4	0.693	0.756	0.913	0.215
IICTU5	0.683	0.728	0.877	0.234
IICTU6	0.398	0.483	0.725	0.109
PSP1	0.389	0.365	0.254	0.972
PSP2	0.472	0.440	0.349	0.963
PSP3	0.252	0.242	0.156	0.829

The second criterion for discriminant validity is the one proposed by Fornell and Larcker (1981). To attain discriminatory validity, a latent variable should share more variance with the indicators given to it than with any other latent variable, according to Fornell and Larcker (1981). To put it succinctly, the latent variable's AVE should be greater than its highest square correlation with other latent variables. It is evident from Table 4.3 that the latent variables exhibit a higher degree of variance sharing with their assigned indicators in comparison to other latent variables. The Table's numbers are

bolded to indicate this. The bold numerals, which display the greatest values in both rows and columns, are also visible. We can conclude that discriminant validity has been satisfied in this instance.

Table 4.3 Discriminant validity (Fornell-Larcker Criterion)

Constructs	Government ICT Use	ICT Access	Individual ICT Use	Public Sector Performance
Government	0.831			
ICT Use				
ICT Access	0.837	0.887		
Individual ICT Use	0.771	0.816	0.818	
Public Sector Performance	0.421	0.394	0.291	0.924

4.3 Structural Model Assessment

Testing the structural model comes next, following a successful validation of the measurement model (Hair et al., 2019; Urbach and Ahlemann, 2010). The structural model was assessed using the five crucial procedures recommended by (Hair et al., 2019; Urbach and Ahlemann, 2010). The following subsections go over these steps:

4.3.1 Evaluating the Structural Model for Problems with Multicollinearity

Examining multicollinearity is the first stage in evaluating the structural model. In a multivariate regression study, multicollinearity happens when there is a combination of predictors (O'Brien, 2007). By examining the variance inflation factor (VIF) for each independent construct, multicollinearity was evaluated. Collinearity problems must be avoided with a minimum threshold of 5 or less (Hair, Ringle, and Sarstedt, 2011).

According to Hair et al. (2011), Hair et al. (2016), Mansfield et al. (1982), if this cutoff is reached, the construct in question is nearly a perfect linear combination of independent variables already in the equation. All of the VIF values in Table 4.4 are less than 5, which suggests that the study's collinearity is not a problem.

Table 4.4 Multicollinearity Statistics (Inner VIF)

CONSTRUCTS	GOVERNMENT USAGE	ICT ACCESS	ICT REGULATION	INDIVIDUAL USAGE	PUBLIC SECTOR PERFORMANCE
Government Usage			1.922		3.502
ICT Access	1.000			1.000	
ICT Regulation					2.981
Individual Usage			1.922		1.965
Public Sector Performance					

Source: SmartPLS

4.3.2 Assessing Structural Model for Path Coefficient

It is crucial to assess the route coefficient between the model's latent variables after collinearity has been determined (Na et al., 2024). In order to accomplish this, we use a 0.1(10%) two-tailed distribution and a huge number of 5000 subsamples in a bootstrapping procedure in SmartPLS. Bootstrapping is a “non-parametric resampling procedure that assesses the variability of a statistic by examining the variability of the sample data rather than using parametric assumptions to assess the precision of the estimates” (Streukens and LeroiWerelds, 2016, p. 2). It is required to conduct a non-parametric test using SmartPLS since PLS-SEM does not demonstrate that the data is normally distributed (da Silva, Martins, Rodríguez, & Ferreir, 2024). For the purpose of analyzing the direct and indirect impacts, the bootstrapping method generates t-statistics (Hair et al., 2016). The results are displayed in Table 4.6. For a significance level of 10% (two-tailed), a minimal critical value of 1.65 is appropriate because a 95% confidence interval is considered (Hair et al., 2011). Table 4.5 shows that five of the seven hypotheses—that is, those with a crucial t-value of 1.65 or higher—are supported. The identical outcomes are also displayed in Figure 4.2.

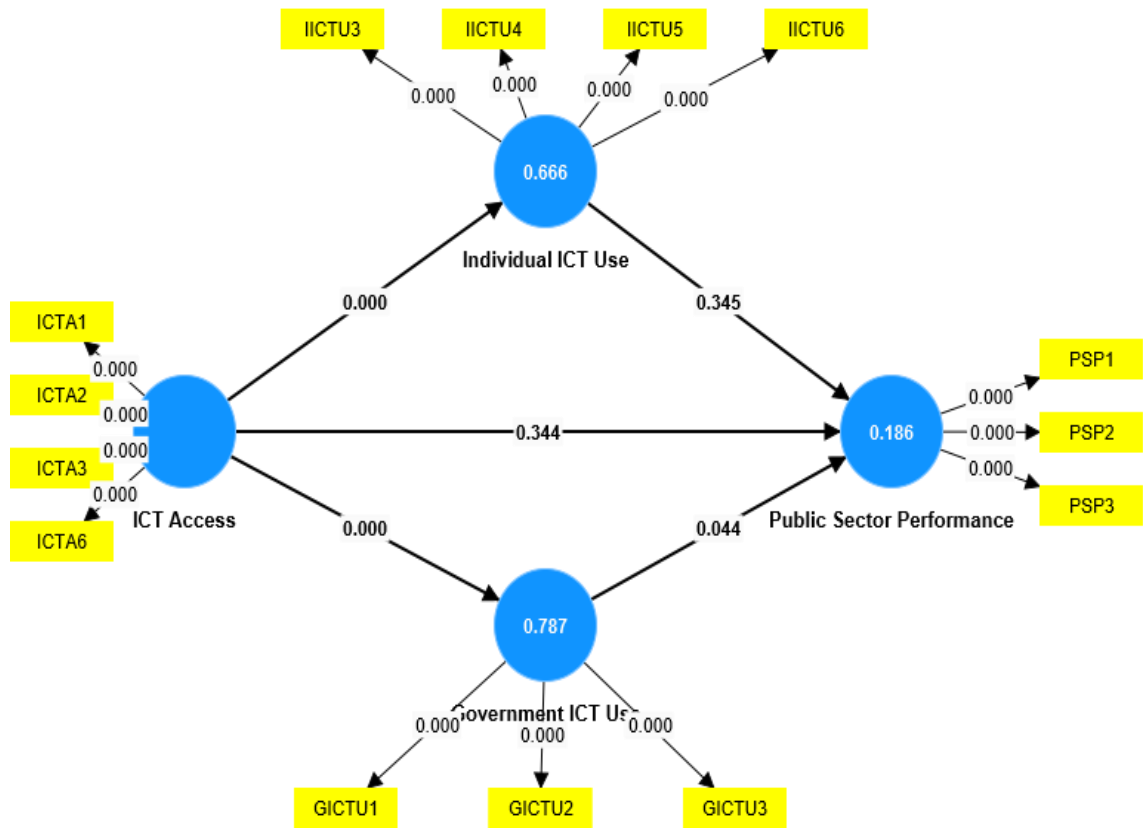


Figure 4.2 Hypothesis Testing for Direct Effect

Table 4.5 Direct Relationship for Hypothesis Testing.

Hypotheses	Relationship	Path coefficients	T values	Inference	95% CI	95% CI
					LL	UL
H1	Government ICT Use ->Public Sector Performance	0.363	1.993	supported**	-0.139	0.813
H2	ICT Access -> Government ICT Use	0.887	60.985	supported**	0.842	0.919
H3	ICT Access -> Individual ICT Use	0.816	28.023	supported**	0.733	0.879
H4	ICT Access -> Public Sector Performance	0.188	5.247	supported**	-0.323	0.700
H5	Individual ICT Use -> Public Sector Performance	-0.142	0.937	Not supported	-0.533	0.251

Table 4.6 Mediating effect results

Hypotheses	Relationship	Path coefficients	T values	Inference	95% CI LL	95% CI UL
H6	ICT Access -> Individual ICT Use -> Public Sector Performance	-0.116	0.931	Not supported	-0.533	0.251
H7	ICT Access -> Government ICT Use -> Public Sector Performance	0.322	1.986	supported**	-0.139	0.813

4.3.3 Assessing the Goodness of Fit

Once the path coefficient's relevance in the structural model was assessed, the goodness of fit (GOF) of the model was also evaluated. This evaluation tells us if the model fits the data well or poorly (Čuta et al., 2024). According to Dijkstra and Henseler (2015), the GOF test also aids in the identification of measurement and structural model misspecifications by the researcher. The most used criterion is the R-square determination coefficient (R^2) (Hair et al., 2019). The explanatory power of the model is measured by R-square. According to Hair, Sarstedt, Hopkins, and Kuppelwieser (2014), it depicts the cumulative impacts of the external latent factors on the endogenous latent variable. R-square values range from 0 to 1, increasing with explanatory power. R-square values of 0.25, 0.50, and 0.75, according to Hair et al. (2011) and Henseler et al. (2009), can be used as a general guideline to indicate weak, moderate, and substantial. According to Chin (1998), R-square values in accounting research should be interpreted as weak if they are 0.190 or below, average if they are around 0.333, and large if they are close to 0.670. According to Table 4.7, the model's R-square is 0.666, which is regarded as significant in accounting research. This indicates that 67% of the variability in the endogenous factors may be explained by the combined exogenous latent variables. (Urbach and Ahlemann, 2010; Hair et al., 2019).

Table 4.7 R Square

Dependent Construct	R-square	R-square adjusted
Government ICT Use	0.787	0.786
Individual ICT Use	0.666	0.664
Public Sector Performance	0.686	0.666

Henseler, Hubona, and Ray (2016) recommended using one of the following criteria to determine a model's GOF in PLS-SEM. These are the geodesic discrepancy (dG), the unweighted least squares discrepancy (plus), and the standardized root mean squared residual (SRMR). A model's GOF can be assessed using any one of these three methods. This investigation made use of the SRMR. This is because numerous research have established SRMR as a suitable metric for evaluating the goodness of fit in PLS-SEM, and it has been utilized extensively in these studies (Bailey et al., 2017; C. S. Lee and Ma, 2012; Pappas, 2017). The general rule with this criterion is that the model fits the data better the lower the SRMR. When the SRMR is zero, a perfect match is achieved. As to Heseler et al. (2016), an SRMR value of 0.08 or less is considered appropriate or suggested. A SRMR value greater than 0.08 signifies a lack of fit. The predicted SRMR value of 0.016 from Table 4.8 is below the cutoff of 0.08. Thus, this suggests that there are no measurement or structural model misspecifications and that the model is well fitted.

Table 4.8 Goodness of Fit (SRMR criteria)

	Path coefficient	95% CI
Estimated Model	0.065	0.046

4.3.4 Assessing the Effect Size

The next necessary step after assessing the GOF of the structural model is to use Cohen's f-square to determine the effect size of each path in the SEM (Cohen 1988). According to Cohen (1988), effect sizes quantify the degree to which an independent construct influences the dependent construct. In other words, it assesses the relative importance of the independent and dependent constructs (Urbach and Ahlemann, 2010). The f-square values are calculated when the PLS algorithm is executed using

SmartPLS. The values of the f-square are displayed in Table 4.10. The exogenous latent variable or independent construct has a minor, medium, or high effect on the dependent construct, according to f-square values between 0.020 and 0.150, between 0.150 and 0.350, and above 0.350 (Chin, 1998; Cohen, 1988; Gefen et al., 2000). Thus, based on Table 4.9, it can be inferred that the independent constructs of ICT access significantly influence the dependent constructs of government ICT use, individual ICT use, and public sector performance.

Table 4.9 F-square

Constructs	Government ICT Use	ICT Access	Individual ICT Use	Public Sector Performance
Government ICT Use				0.033
ICT Access	3.704		1.998	0.007
Individual ICT Use				0.008
Public Sector Performance				

4.4 Discussion of results

4.4.1 The Effects of ICTs on Public Sector Performance

The study's objective is to examine the effects of ICTs on public sector performance. The study specifically explored the specific effects of government and individual ICT use mediating between ICT access and the public sector. This aspect has been largely ignored by extant research. Filling this gap, this study empirically tested the effects of ICTs and public sector performance by relying on data from 131 countries globally. Of the seven hypotheses formulated in this study, five (5) were supported and two (2) were

otherwise. Specifically, government ICT use, and ICT access, were discovered to significantly influence public sector performance. In addition, ICT access was discovered to significantly influence government and individual ICT use. Lastly, the mediating role of government ICT use was discovered to significantly influence ICT access and public sector performance. The outcome of the supported hypothesis can be seen in Table 4.7.

4.4.1.1 Government ICT Use and Public Sector Performance

From the analysis of the results, it was revealed that the hypothesis of Government ICT use, being positively associated with public sector performance, was supported. Government ICT (Information and Communication Technology) use involves the integration of digital tools and systems by governmental agencies to enhance their services, operations, and engagement with the public. This includes using software for data management, online platforms for service delivery, and digital communication tools to interact with citizens. The result implies that ICT adoption and effective use by government agencies can result in increases in the effectiveness, efficiency, responsiveness and reduction of corruption in government services. The research emphasises how crucial ICTs are to the modernization of the public sector and to better governance. Governments may improve service delivery, better address citizen needs, and ultimately build public trust and confidence in government institutions by embracing digital technologies and acquiring the requisite digital skills. The findings are thus in line with prior research that mostly focused on the role that government ICT use plays in driving public sector performance (Adam et al., 2020; Raghupathi & Wu, 2011). Also, the introduction of ICT in government processes fundamentally enhances operational efficiency. By automating routine tasks, such as payroll processing, transaction recording, and financial reporting, ICT reduces the time and human error

associated with manual processes. This increase in efficiency often leads to more timely and reliable financial information. Moreover, ICT enables better management of public funds by facilitating more rigorous and real-time tracking of income and expenditure. This government effectiveness is crucial not only for internal management but also for maintaining public trust, as stakeholders have clearer insights into how funds are being allocated and spent.

4.4.1.2 ICT Access and Public Sector Performance

As part of the hypothesis stated, ICT access, being positively associated with public sector performance was supported. The empirical discovery is that ICT access has a substantial impact on promoting public sector performance. This suggests that ICTs can improve the efficacy, efficiency, and government effectiveness of government services when people and organizations have access to and make use of them. The findings emphasize how important ICTs are to improving public sector performance and providing better results for citizens. Through the allocation of resources towards ICT infrastructure, training, and digital literacy efforts, governments can effectively leverage technology to enhance governance and provide better public (David and Phillips 2023; Cuadrado-Ballesteros, Ríos et al. 2023). ICT access facilitates greater government effectiveness and accountability in public sector accounting. By making financial data more accessible to stakeholders through online platforms and digital reports, ICT enables citizens, oversight bodies, and other interested parties to scrutinize public spending more effectively. This government effectiveness is crucial for building public trust and for enabling democratic governance, where accountability is paramount. While the initial investment in ICT can be substantial, over time, access to technology in the public sector results in significant cost savings. Automating routine tasks and reducing the need for physical storage and large public sector departments

can decrease operational costs. Furthermore, improved efficiency and accuracy reduce the costs associated with errors and financial mismanagement. However, the findings go contrary to those of prior studies (Panagiotopoulos, Protogerou, & Caloghirou, 2023), (Al Sayegh, Ahmad, AlFaqeeh, & Singh, 2023) and (Hong, Kim, & Kwon, 2022). Notwithstanding, these studies were conducted in the private sector where performance is measured mainly on profitability. Therefore, findings from these studies may not necessarily apply to the public sector.

4.4.1.3 Individual ICT Use and Public Sector Performance

In addition, the analysis of findings revealed that the hypothesis of individual ICT use, being positively associated with public sector performance, was not supported. One of the primary concerns regarding individual ICT use is the potential for distraction. Personal use of internet-enabled devices can lead to non-work-related activities during office hours, such as browsing social media, personal messaging, or online shopping. These distractions can significantly reduce an individual's productivity and focus, which is crucial in public sector roles that require high attention to detail and concentration on complex financial data. Moreover, the misuse of ICT resources can extend beyond mere distraction, encompassing the use of organizational resources for personal gain, which directly undermines professional integrity and performance in the public sector. Another significant concern is the security risks associated with widespread individual ICT use. As public sector performance involves sensitive financial information, any breach can have severe consequences. Individual ICT devices, especially when used to access remote networks or to store sensitive data locally, can be vulnerable to security threats such as hacking, phishing, and malware attacks. These security breaches not only compromise the integrity of financial data but also require substantial resources to address, diverting attention from other critical

functions. While ICT can enhance efficiency and accuracy, there is a risk of over-reliance on technology. This dependence can become a detriment if individuals begin to substitute technology for critical thinking and problem-solving skills. For example, accountants might rely too heavily on software for auditing processes, missing out on nuanced insights that a more hands-on approach might have revealed. This over-reliance can lead to a degradation of professional skills and a reduction in the quality of work, especially if technology fails or if the situation requires judgment that the software cannot provide. However, findings from research on other accounting domains have revealed that individual ICT use positively influences public sector performance. This includes the study of (Cheshmehzangi et al., 2021; Strielkowski et al., 2021; Ben Youssef et al., 2022 and Alhassan et al 2021).

4.4.1.4 ICT Access and Government ICT Use

ICT access refers to the availability and usability of information and communication technology resources, such as the Internet, computers, smartphones, and other digital devices and services. It encompasses the ability of individuals and organizations to connect to and use these technologies effectively. As part of the hypothesis, ICT access being positively associated with government ICT use was supported. The finding goes in line with previous studies by Hussain et al. (2023); Abdul-Wakeel Karakara & Osabuohien, (2022); Adam & Dzang Alhassan, (2021); Bilan, Oliinyk, Mishchuk, & Skare, (2023) that found ICT access significantly influence government ICT use. The findings indicate that ICT access in a country promotes government utilisation of ICT. Government agencies may adopt and use digital technologies more efficiently if more people have access to and use ICTs, as evidenced by the finding that ICT access positively affects government use of ICTs. This higher use may result in better citizen communication, better government services, and more economical use of resources.

The findings from this research emphasize how critical it is to close the digital gap and guarantee that everyone has access to digital tools and the Internet. By doing this, government agencies as well as private citizens may be motivated to use ICTs to advance societal welfare (Lythreathis, Singh et al. 2022; Adam and Alhassan 2021; Benjelloun 2023).

4.4.1.5 ICT Access and Individual ICT Use

Individual ICT (Information and Communication Technology) refers to the personal use of digital technologies, such as computers, smartphones, and the Internet, to access, process, and communicate information. It encompasses a range of activities including online communication, digital content creation, data management, and using software applications for various personal and professional tasks. Individual ICT enables users to enhance productivity, connect with others, and access vast information resources, facilitating personal and professional development in a digitally connected world. As stated in the hypothesis, ICT access being positively associated with individual ICT use, was supported. Public sectors have always been data-intensive, requiring meticulous record-keeping, data processing, and analysis. With the advent of ICT, the public sector gained access to advanced software and systems that streamline these processes. For instance, accounting software such as QuickBooks, SAP, and Oracle have become integral to the profession, offering functionalities that automate calculations, generate financial reports, and ensure compliance with regulatory standards. The availability of these tools makes it imperative for the public sector to adopt ICT in their daily tasks to enhance accuracy and efficiency. Therefore, access to ICT naturally leads to its increased use, as individuals seek to leverage these tools to improve their work quality and productivity. Moreover, the benefits of ICT in the public sector extend beyond automation. ICT facilitates real-time data access and remote work

capabilities, which have become crucial in today's globalized business environment. Cloud computing, for example, allows individuals to access financial data from anywhere at any time, promoting flexibility and collaboration among team members across different locations. This capability is especially beneficial for firms with clients worldwide, enabling seamless communication and data exchange. The increased access to ICT thus directly influences its use, as individuals recognize the value of these technologies in enhancing their operational efficiency and service delivery.

4.4.2 Effect of Mediating Construct

This section explores the influence of mediating for this study on the relationships between the independent constructs and the dependent constructs. This study adopted two mediators, that is, individual and government ICT use. Extant research in the ICT and public sector domain has called for research to examine the effect of these mediators on the relationship between the independent constructs and the dependent (Ali, M., & Yaseen, M. 2020; Kim, S., & Lee, J. 2021; Zhang, Y., & Xu, F. 2022; Hassan, H., & Mingers, J. 2023) Given this, the discussion under this section focuses on the effects of these mediators on the accountability theory.

4.4.2.1 Mediating Effects of Government ICT Use on the Linkages Between ICT Access and Public Sector Performance

On the mediating effects of government ICT use on the linkages between ICT access and public sector performance, results presented in Table 4.7 show support for the mediating effects of government ICT use on the impact of ICT access on public sector performance. The results show that when governments actively use ICTs to deliver services, gather data, and enhance decision-making, the favourable effects of ICT availability on public sector performance are amplified. This implies that the potential benefits of technology for public governance cannot be completely realised by merely giving people access to it. In other words, the use of ICTs by the government acts as an

intermediary, converting the potential advantages of ICT access into real gains in the efficiency of the public sector. Governments may improve data-driven decision-making, expedite procedures, increase communication, and ultimately provide residents with better services when they successfully use ICTs. This result emphasises how crucial it is to establish an all-encompassing strategy for ICT adoption in the public sector. Giving people access to technology may not be enough. They may also need to acquire the skills, mindsets, and institutional frameworks necessary to fully utilise ICTs for effective service delivery and government.

4.4.2.2 Mediating Effects of Individual ICT Use on the Linkages Between ICT Access and Public Sector Performance

On the mediating effects of individual ICT use on the linkages between ICT access and public sector performance, results presented in Table 4.7 show no support for the mediating effects of government ICT use on the impact of ICT access on public sector performance. One of the primary reasons for this no support is the existence of structural and systemic barriers that prevent individual efforts from translating into broader organizational gains. In the public sector, rigid hierarchical structures, bureaucratic procedures, and legacy systems can stifle the potential benefits of individual ICT use. For example, if the organizational infrastructure or policy environment does not support the integration and scaling of digital tools effectively, even proficient individual use will have a limited impact on public sector performance. Studies suggest that the mere presence of technology does not guarantee its effective utilization, as organizational and human factors play critical roles (Polisetty, Chakraborty, Kar, & Pahari, 2024); (Manoharan & Sarker, 2023); (Neethirajan, 2024); (Arduini, Manzo, & Beck, 2024). Furthermore, disparities in ICT access within the public sector itself can mitigate the influence of individual ICT use on broader outcomes. In scenarios where access to technology is unevenly distributed across

different departments or levels of government, the benefits of ICT proficient individuals may be confined to specific pockets of the organization, without catalyzing wider performance improvements. This uneven distribution can result from budget constraints, geographical differences, and varying levels of leadership support, all of which can undermine the potential positive impact of individual ICT engagement. Another significant factor is the digital divide among the workforce itself. Not all public sector employees have the same level of digital literacy or access to training and support, which can limit the extent to which they can use ICT tools effectively. This divide can prevent individual ICT use from substantially enhancing public sector performance if a significant portion of the staff is unable to engage with available technologies adequately. Moreover, individual use of ICT might not lead to improved access or enhanced performance if the technologies employed are not aligned with the organization's strategic goals. For instance, individuals may be using ICT tools that improve personal productivity but do not contribute to the organization's broader objectives, such as improved citizen engagement or government effectiveness. Without strategic alignment, even well-intentioned ICT use by individuals can end up being siloed, failing to make a significant impact on overall access or performance. The quality of human resources (HR) within the organization appears to have a more pronounced impact on public sector performance. For instance, ICT adoption can improve HR quality, which in turn has a direct positive effect on performance (Adam, Alhassan, & Simpson, 2020). However, the link between ICT adoption and performance, mediated by HR quality, shows that the influence of ICT on performance is conditional upon the quality of HR management practices within the organization.

4.5 Chapter Summary

This chapter provided an analysis of data gathered at the global level of ICTs and public sector performance. Analysis of the gathered data helped to meet this study's research goals. The study examines the effects of ICT access on individual and government use of ICTs, the impact of individual and government ICT use on public sector performance, and the mediating role of individual and government ICT use on the impact of ICT access on public sector performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The preceding chapter addressed the research questions regarding the literature review and focused on talking about the examination of empirical findings. Consequently, the purpose of this chapter is to wrap up the study by summarizing its main conclusions in accordance with its goals and talking about how the research findings may affect future research, policy, and practice.

5.2 Summary of Findings

The results of this study are presented based on the research objectives. First, the effect of ICT access on individuals and government use of ICTs. Second, findings on the impact of individual and government ICT use on public sector performance. Finally, the mediating role of individual and government ICT use on the impact of ICT access on public sector performance. Details of these are given in the three subsections below.

5.2.1 Effect of ICT Access on Individuals and Government Use of ICTs

As part of the hypothesis, ICT access being positively associated with government ICT use was supported. The finding goes in line with previous studies by Hussain et al. (2023); Abdul-Wakeel Karakara & Osabuohien, (20220; Adam & Alhassan, (2021); Bilan, Oliinyk, Mishchuk, & Skare, (2023) that found ICT access significantly influence government ICT use. The findings indicate that ICT access in a country promotes government utilisation of ICT. Government agencies may adopt and use digital technologies more efficiently if more people have access to and use ICTs, as evidenced by the finding that ICT access positively affects government use of ICTs. This higher use may result in better citizen communication, better government services, and more economical use of resources. Also, ICT access being positively associated

with individual ICT use, was supported. Public sectors have always been data-intensive, requiring meticulous record-keeping, data processing, and analysis. With the advent of ICT, the public sector gained access to advanced software and systems that streamline these processes. For instance, accounting software such as QuickBooks, SAP, and Oracle have become integral to the profession, offering functionalities that automate calculations, generate financial reports, and ensure compliance with regulatory standards. The availability of these tools makes it imperative for the public sector to adopt ICT in their daily tasks to enhance accuracy and efficiency. Therefore, access to ICT naturally leads to its increased use, as individuals seek to leverage these tools to improve their work quality and productivity.

5.2.2 Impact of Individual and Government ICT Use on Public Sector Performance

The literature review reveals the impact of government and individual ICT use on public sector performance and the mediating role of individual and government use of ICTs on the impact of ICT access on public sector performance. Not all of this hypothesis influences public sector performance. Three of the hypotheses significantly influence public sector performance. That is government ICT use, ICT access, and ICT Access -> Government ICT use was found to influence Public Sector Performance.

5.3 Mapping out Research Objectives with Research Findings and Contribution

Research Purpose: This study aims to investigate the role of ICTs in promoting public sector performance at the global level. Table 7.1 gives a summary of the findings of the study in line with the study's objectives. Furthermore, the contributions, implications, and recommendations of the study are outlined.

Table 5.1 Mapping Research Objectives to Findings and Contributions

Research Objectives	Research Findings	Supporting Literature	Contribution, Implications, and Recommendations
To examine the effects of ICT access on individuals and government use of ICTs.	The advert of ICT access has enabled government and individual ICT use.	Adam and Alhassan (2021); Slabe-Erker and Primc (2024); Abdul-Wakeel Karakara and Osabuohien (2022)	This study adds to the existing knowledge regarding ICT access and government and individual ICT use at a global level. Furthermore, this study responds to the gaps identified in the literature considering that fewer studies have been carried out in a global context.
To investigate the impact of individual and government ICT use on public sector performance.	The findings indicated that Government and individual ICT use positively influences public sector performance	Adam & Alhassan (2021); Afees (2023); AbdulKareem et al. (2024); Abdulkareem & Mohd Ramli (2022)	This study relied on accountability theory. Arguably, this is the first study to follow the concept of accountability theory in ICTs and public sector performance research. Previous studies have largely adopted theories such as institutional theory,

digital governance theory and resource-based view theory. Therefore, this study adds to the literature by giving a different perspective on accountability and effectiveness using accountability theory. Moreover, the extant literature has largely relied on data from single countries and conducted in the developed country context thus limiting their findings to such contexts

<p>To investigate the mediating role of individual and government ICT use on the impact of ICT access on public</p>	<p>The mediating role of government ICT use on the impact of ICT access on public sector performance</p>	<p>Abdul-Kareem et al. (2024); Abdul-Salam, Adam, Alhassan, Gbambegu Umar, & Nterful (2024); Abdul Kareem & Oladimeji (2024)</p>	<p>Arguably, the first study to be carried out on the mediating role of government and individual ICT use on the impact of ICT access on public sector performance.</p>
	<p>was supported.</p>		

sector performance	<p>The hypotheses of the mediating role of individual ICT use on the impact of ICT access being positively associated with public sector performance were not supported.</p>	<p>Adam & Alhassan, (2021); Panagiotopoulos, Protogerou, & Caloghirou (2023); Abdul-Salam et al.(2024)</p>	<p>It is important to indicate the implications of the results of this study on the ICT and public sector performance. Findings revealed that ICT access influences government and individual ICT use and ICT access and government ICT use influence public sector performance.</p> <ul style="list-style-type: none"> • There are three ways to communicate the contribution of this study. That is research, practice, and policy. • Concerning research, this study was carried out to investigate the role of ICTs in promoting public sector performance
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by enhancing
accountability,
government
effectiveness, and
controlling
corruption in the
public sector. This
has largely been
ignored by previous
research. Similarly,
the mediating effect
of variables such as
Government and
individual use of
ICT on the
relationship between
ICT access and
public sector
performance has
largely been ignored
by previous
research. Arguably,
this is the first study
carried out on the
nexus between ICTs

and public sector performance.

- In practice, the study shows how ICTs promote public sector performance. The study can guide the formulation and revision of policies related to the access and use of ICTs in the public sector. Policymakers can identify gaps, challenges, and opportunities that may arise in the context of implementing ICT-driven initiatives to promote accountability, government effectiveness and

control of corruption
in the public sector.

To policy, creating a favourable ICT environment will influence the government and individuals to have access to it. An enabling ICT environment in the form of ICT access and infrastructure will equip government and individuals to promote accountability, government effectiveness and control corruption which will enhance public sector performance.

Similarly, an enabling environment in the form of ICT legislation and policy will ensure that government and individual financial information is protected and secured. Thus, this study will provide policymakers,

especially the government sectors, a clear insight into the effect of ICTs on promoting accountability, government effectiveness and controlling corruption

Source: Authors construct

5.4 Research Contribution and Implication

5.4.1 Implication of Research

Concerning research, this study was carried out to investigate the role of ICTs in promoting public sector performance by enhancing accountability, government effectiveness, and controlling corruption in the public sector. This has largely been ignored by previous research. Similarly, the mediating effect of variables such as Government and individual use of ICT on the relationship between ICT access and public sector performance has largely been ignored by previous research. Arguably, this is the first study carried out on the nexus between ICTs and public sector performance. The study's reliance on archival sources of data enables the easy reproducibility and generalizability of findings from this study to the larger population. This study, therefore, adds to the limited literature in the area of ICTs and public sector performance.

In addition, this study relied on the foundation of accountability theory to analyze the impact of ICTs on public sector performance. Arguably this is the first study to follow the concept of accountability theory in ICTs and public sector performance research. Previous studies have largely adopted theories such as digital governance theory, institutional theory, and resource-based view theory. Therefore, this study adds to the

literature by giving a different perspective on public sector performance using countability theory.

5.4.2 Implication to Practice and Policy

In practice, the study shows how ICTs promote public sector performance. The study can guide the formulation and revision of policies related to the access and use of ICTs in the public sector. Findings from the study will help practitioners and policymakers understand the reasons for differences in countries' ICT access, government and individual ICT usage and public sector performance. Furthermore, results from this study showed the mediating effect of government and individual use of ICTs on the nexus between ICT access and public sector performance. This may, therefore, help to continue to educate countries to put in measures that promote affordable access to ICTs and therefore, enable them to effectively use ICTs to propel public sector performance. Similarly, findings from this study show that governments must adopt policies that encourage the government use of ICTs in their respective communities and countries. This is because these will inform government ICT strategies by identifying the key areas and applications where ICT can have the most significant impact on public sector performance. This includes improving service delivery, efficiency, and government effectiveness. Policymakers can identify gaps, challenges, and opportunities that may arise in the context of implementing ICT-driven initiatives to promote accountability, government effectiveness and control of corruption in the public sector.

To policy, creating a favourable ICT environment will influence the government and individuals to have access to it. An enabling ICT environment in the form of ICT access and infrastructure will equip government and individuals to promote accountability, government effectiveness and control corruption which will enhance public sector performance. Similarly, an enabling environment in the form of ICT legislation and

policy will ensure that government and individual financial information is protected and secured. Thus, this study will provide policymakers, especially the government sectors, a clear insight into the effect of ICTs on promoting accountability, government effectiveness and controlling corruption. Finally, although imparting ICT skills is essential for the use of ICTs and public sector performance, it may not be enough. This is because technology developments may inadvertently recreate access limitations or exacerbate them in the design and development process. This is evident where technology use may be restricted because of language requirements or even energy consumption needs or some other difficulty in the use of technology.

5.5 Limitations and Recommendations for Future Research

This study examined the effects of ICTs on public sector performance in 131 countries worldwide.

However, this current study has some limitations. The studies may also take into account conducting larger global-level investigations once more information is accessible. Furthermore, by utilizing data from secondary sources, the study was limited by the constructs and measurement items contained in the dataset. Therefore, future studies should utilize primary data collection techniques in their research to better possess some degree of control over the constructs in their study. Nevertheless, given the expanding usage of secondary data sources in accounting research and the time and resources required to gather data from more than 131 countries, this study's use of secondary data sources turned out to be the most effective. In addition, future studies may employ qualitative approaches to unearth individual and government ICT usage interpretation on public sector performance. Lastly, this study employed a cross-sectional survey design. Future studies should employ panel data which will help in analyzing data that varies across both time and individuals, allowing more complex

questions to be answered, such as the effects of changes in policy over time on different population groups.

5.6 Conclusion

This study investigates the role of ICTs in promoting public sector performance at the global level. To address the objectives of this study in Section 1.4, the study leaned on the foundations of accountability theory. Furthermore, the study examined how ICTs influence public sector performance at the global level. Accountability theory was chosen among other theories such as institutional theory, digital governance theory, and resources base view theory because it emphasizes the importance of accountability and government effectiveness, where citizens can readily access information about government operations. The study adopted secondary data from 131 countries globally. Constructs used for this study were validated by monitoring indicator loadings (Hair et al., 2019) whilst the hypothesis was tested by assessing the path coefficient for significance (Hair et al., 2019; Urbach and Ahlemann, 2010).

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