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Digital Transformation at a selected South African Higher Education Institution: An Administrative Perspective

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business

Johannesburg, 2025

ABSTRACT

As a result of the Fourth Industrial Revolution and the digital transformation which has been accelerated by the COVID-19 pandemic, digital transformation has been identified as a critical imperative that higher education institutions (HEIs) cannot ignore. Nevertheless, while academic functions have gradually shifted to the use of digital technologies, administrative functions have been rather slow to do so, and this tendency is especially pronounced in resource-constrained public institutions in South Africa. This study examines the digital transformation of administrative functions at a public university in South Africa, looking at the strategies, the impact of said strategies, barriers, and adaptation mechanisms that affect the effectiveness of administration. Based on a multi-theoretical framework which comprises of Transformational Leadership Theory, Institutional Theory, Change Management Theory and Lean Management Theory, the study uses a qualitative explorative design. Semi-structured interviews were conducted with professional administrative staff and management to collect data on the perception of digital transformation practices. Thematic analysis identified successful strategies (cloud-based systems, performance monitoring, digital upskilling), barriers (technological infrastructure deficits, resistance to change, limited funding) and adaptation mechanisms (Lean Digital Transformation, contextualised training tools) from the data. Thus, the study concludes that digital transformation in administrative contexts is most effective when it is holistic and people-centred, with clear strategic direction, cultural engagement, and sustained leadership. The implications of the findings thus highlight the need for South African HEIs to develop and embed tailored and scalable transformation frameworks that focus on the dual imperatives of digital literacy and institutional agility to support service delivery and long-term competitiveness.

KEYWORDS

Digital Transformation, Administrative Efficiency, Higher Education Institutions, South Africa, Digital Literacy and Change Management.

DECLARATION

I, Tania Melim-Lazorik, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Tania Melim-Lazorik Signature: Tania Melim-Lazorik

Signed at…..University of Witwatersrand , Johannesburg……

On the…31st day of… March .. 2025

DEDICATION

This research report is dedicated to my family and friends, whose unwavering love, support, patience, and encouragement carried me through every stage of this journey.

To my child, the heart of my purpose and to my husband, who stood by me through every challenge, thank you for your strength, perseverance, and for reminding me never to give up, even when the path was difficult.

To my parents, who instilled in me the values of hard work and education your sacrifices and unwavering love have shaped the person I am today.

To my brothers, whose successes inspire me to lead by example and continue paving a path they too can be proud to follow, thank you for being my motivation and my pride.

This work is a reflection of your influence, and I am deeply grateful for the role each of you has played in making it possible.

Finally, to my supervisor, colleagues, line manager, and the professional administrators within higher education institutions who supported and contributed to this research. Thank you for your time, insights, and for embodying the spirit of continuous improvement. This report stands as a testament to your commitment to administrative excellence and innovation.

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LIST OF ACRONYMS

Acronym	Full Form
AI	Artificial Intelligence
BI	Business Intelligence
CRM	Customer Relationship Management
DT	Digital Transformation
HEI	Higher Education Institution
ICT	Information and Communication Technology
ITC	Information Technology Centre
KSU	King Saud University
KPIs	Key Performance Indicators
LMS	Learning Management System
NDP	National Development Plan
NQF	National Qualifications Framework
PGC	Post Graduate Committee
PSU	Prince Sultan University
RPA	Robotic Process Automation
SIS	Student Information System
WBS	Wits Business School

CHAPTER 1. INTRODUCTION

1.1 Statement of purpose

This qualitative research explores the perceived impact of digital transformation strategies to streamline administrative processes and foster a culture of innovation and agility amongst administrators within the public higher education institution (HEI) sector. It aims to identify current inefficiencies, obstacles to innovation, digital adoption levels, and the digital competency needs of administrators to perform optimally in the workplace. Subsequently, this will lead to the development of a comprehensive training tool designed to identify digital skills gaps, drive digital adoption, and enhance administrative efficiency through digitization and other digital transformative activities.

1.2 Background of the study

The world has seen significant changes in the past decade, especially in the global landscape of higher education learning, due to the strides being made in digital technology and the imperative to integrate these technologies into the day-to-day functions and operations of institutions. This was exacerbated by the COVID-19 outbreak which acted as a catalyst to bring about digital transformation (Hasan, 2023). The initial focus of digital transformation in public higher education often emphasised the academic side, such as learning delivery, student support, and research. Meanwhile, operations and administration frequently lagged, struggling to keep pace with the rapid changes. This imbalance created challenges in effectively managing the back-end administrative processes critical for the smooth functioning of educational institutions (Bucăţa et al., 2022).

To compete with its international counterparts, the public higher education sector in South Africa is under constant pressure to digitally transform which entails but is not limited to enhancing online learning, the efficiency of administrative processes, and adopting an innovative culture (Habib, 2023). Digital

transformation, within the realm of HEI's administration, entails the incorporation of technologies across all operational aspects.

essentially altering the way institutions operate and provide services. This shift goes beyond automating processes; it involves rethinking administrative functions to enhance responsiveness, lower costs through efficiency and improve user experience (Damar et al., 2024). This has become particularly crucial due to the unfavourable social-economic context in South Africa where access to education is problematic and institutions often operate under the constraints of scarce resources (Times Higher Education, 2024).

International universities, around the world have diverse systems and plenty of resources that allow them to easily incorporate cutting-edge technologies and provide thorough training in digital skills. On the other hand, universities in South Africa encounter limitations in resources and infrastructure which result in them adopting flexible approaches to digital transformation that prioritize fairness and accessibility (Council on Higher Education, 2020). In HEI's, there is a growing awareness of the benefits of technological advancements particularly, for institutions facing budget constraints. Studies and reports have shown that embracing digital advancement can boost efficiency, decrease processing times, reduce administrative expenses, and elevate achievements even in settings with limited resources (Zitter, 2022). This strongly underscores the need for a comprehensive understanding of which digital transformation strategies most effectively enhance operational and administrative efficiency.

Administrative efficiency in HEIs directly influences the service delivery to stakeholders such as students, staff and the public and impacts the institution's ability to fulfil its educational mission and gain a competitive advantage (Ajigini, 2022). For South African public HEIs, embracing digital transformation presents an opportunity to address longstanding administrative challenges, such as slow service delivery, manual and paper-intensive processes and data silos which hinder effective decision-making. To successfully implement sustainable digital transformation, institutions must place people at the core of their efforts (Friday, 2024). In this context, it is essential to implement comprehensive strategies to upskill and empower their employees in attempts to address resistance to

change, foster an agile/innovative organisational culture, and enhance digital literacy and competence among all stakeholders (Jimoh & Adenekan, 2024).

In addition, institutions must evaluate whether their roles have evolved to meet current and future needs. For example, while the demand for traditional roles like filing clerks who deal with processing manual documents has diminished, the need for data administrators who processes digital documents has grown (Rein et al., 1997). Similarly, although business intelligence (BI) analysts play a crucial role in interpreting current trends, data scientists are increasingly essential for preparing organisations for future challenges. Business intelligence focuses on understanding present data, whereas data science offers predictive insights, enabling proactive decision-making (Bharadiya, 2023).

While existing studies (Hasan, 2023; Ajigini, 2022) broadly discuss digital transformation, this research distinctively targets administrative processes, specifically in the constrained economic environment of South African HEIs, adding new practical insights. This study aims to explore the implementation of digital transformation strategies at a selected institution, focusing on identifying the barriers and opportunities for enhancing administrative efficiency. By investigating the various approaches to digital transformation, this research intends to provide valuable insights that can inform the development of a comprehensive tool for digital adoption in HEIs across South Africa. The goal is to recommend a practical instrument that can assess and address the digital skills gap in the pursuit of enhancing administrative efficiency, thereby improving the overall quality of education and service delivery within the higher education sector. This will enable institutions to remain relevant and competitive in the industry.

1.3 Research problem

It is well known that the integration of digital technologies into administrative processes within higher education institutions is a critical area of focus globally. In South Africa, this need is particularly pressing due to unique socio-economic challenges and historical inequities. The current administrative frameworks in

many South African public higher education institutions are characterized by inefficiencies and a lack of agility, which hinder their ability to innovate and adapt to changing demands (Kanyane, 2023). This challenge is frequently linked to the shortage of a digitally proficient workforce that can effectively adapt to and leverage new tools (Bouwmans et al., 2024). Furthermore, these inefficiencies manifest in prolonged administrative procedures, inadequate data management systems, and limited accessibility to services, which collectively impede the overall effectiveness of these institutions to compete globally at the same standard (AlNuaimi et al., 2022).

Digital transformation offers a promising solution to these challenges by streamlining administrative processes, upskilling the workforce, and fostering a culture of innovation and agility. However, the adoption and implementation of digital transformation strategies in South African higher education institutions face significant barriers. These include financial constraints, resistance to change among staff, and inadequate technological infrastructure (Hasan, 2023). Moreover, there is a lack of comprehensive frameworks or a set path that guides institutions in effectively upskilling, adopting, and integrating these technologies in administrative operations (Fernández et al., 2023).

This research aims to address this gap by investigating the current state of digital transformation in administrative processes within a selected South African public higher education institution. Specifically, it seeks to identify the existing inefficiencies, the key drivers and barriers to digital adoption, and the needs of various stakeholders involved in the administrative processes. Thus, facilitating the development of a comprehensive training tool framework that serves as a guideline to enhance administrative efficiency through digital transformation initiatives.

1.4 Research questions

- What digital transformation strategies have successfully enhanced administrative efficiency in higher education institutions globally and what was the impact?

- What are the key barriers to the adoption of the implementation of digital transformation from an administrative perspective at a selected public higher education institution?
- How can these digital transformation strategies be adapted at a selected public higher education?

1.5 Rationale

Digital transformation is essential across various sectors, yet public higher education institutions (HEIs) often struggle with digital adoption, impacting efficiency and innovation (Marks & AL-Ali, 2020). This research aims to shed light on this, focusing on HEIs' unique challenges through an administrative lens. Studies such as Hanelt et al. (2021) and Vial (2022) argue the importance of digital transformation but often overlook the specific barriers faced by HEIs specifically within administrative divisions.

This research will add to the existing body of knowledge by exploring the specific barriers and opportunities associated with digital transformation within the administrative processes of South African HEIs. While numerous studies have examined digital transformation in higher education globally (Hasan, 2023; Phoo, 2022), there is very few qualitative research focusing, specifically on the South African context. This study will fill this gap by offering localised findings that can inform both policy and practice. Furthermore, the applicability of current research to different contexts will be evaluated to determine its relevance to this study. Where necessary, changes will be suggested to enhance its suitability.

By identifying the unique barriers and proposing solutions tailored to South Africa, this research will add a new dimension to the existing theories on digital transformation in higher education. It will help shift our understanding of how digital strategies can be adapted and implemented in contexts with significant socio-economic and infrastructural challenges. Additionally, the insights gained from this study can be applied to similar contexts in other developing countries facing comparable challenges. This broader applicability enhances the study's

value, contributing to the global discourse on digital transformation in higher education.

From a practical perspective, this study will benefit various stakeholders within the South African higher education sector which includes administrators, policymakers, and IT professionals. Administrators and managers will gain a clearer understanding of the drivers of digital adoption and what digital competencies are required to optimise performance, which in turn can enhance job satisfaction and productivity. Therefore, empowering institutional leaders with insights that will help them develop more effective digital strategies, ensuring that HEIs remain competitive (Schiuma et al., 2024). By developing a comprehensive training tool, the research aims to further identify required digital skills, enhance administrative efficiency and service delivery. This instrument will serve as a practical guide for institutions seeking to implement digital transformation strategies, thereby fostering a culture of innovation and agility.

1.6 Delimitations of the study

The delimitations of this study define the parameters for conducting the research. These parameters are set to maintain a focus and ensure that the research goals are well-defined and attainable. The following aspects are included and excluded in this study:

i. **Geographical Scope:** This research focuses on a university in South Africa. The conclusions and suggestions provided are tailored to this setting. Therefore, it may not have relevance to universities in different countries.

ii. **Institutional Focus**: The research focuses exclusively on public higher education institutions. Private higher education institutions and other types of educational organisations are excluded from this study.

iii. **Administrative Perspective**: The study examines digital transformation from an administrative perspective. It does not address digital transformation in academic or pedagogical practices within the institution.

iv. **Stakeholder Groups**: The primary stakeholders included in this study are administrative staff and management within the selected institution. Other stakeholders such as students, academics, and external collaborators are not the focus of this research.

v. **Technological Solutions:** The study will focus on currently available digital technologies and their implementation within administrative processes.

vi. **Methodological Approach:** This research adopts a qualitative methodology, utilising interviews to gather data. This study focuses exclusively on qualitative methods, relying on interviews and thematic analysis to generate rich, contextual insights. Quantitative techniques such as surveys and statistical analysis fall outside the scope.

By clearly defining these delimitations, this study aims to provide a focused and detailed analysis of the digital transformation of administrative processes within a specific South African public higher education institution. This approach ensures that the research remains manageable and relevant to the stated research objectives.

1.7 Definition of terms

To ensure clarity and a mutual understanding of key concepts and terms used throughout this study, the following definitions are provided. Each term is defined in the context of this research, with references to authoritative sources where applicable.

Administrative Efficiency: Refers to the ability of an institution to achieve its objectives by managing its administrative functions efficiently and effectively, ensuring the reduction of waste and optimal use of resources (Alvarez-Sández et al., 2023). It involves the application of processes that enhance productivity and reduce redundancy allowing institutions the capacity to achieve desired results with minimal effort and cost (Gunuboh, 2023).

Digital Adoption: The process by which the institution integrates digital technologies into its operations. It refers to the ability of the institution's staff and

stakeholders to embrace, implement, and effectively use these technologies (Armstrong & Lee, 2023)

Digital Literacy: refers to the ability to effectively use digital devices which includes a variety of digital skills such as technical, information, and communication skills. Consequently, understanding how to navigate, evaluate, and create digital information across various technologies (Tabane, 2022).

Digital Transformation: A strategic process of change in response to technological disruptions that involves the integration of digital technologies into all operations of the institution. Ultimately changing how it functions and delivers value to stakeholders. This transformation enables institutions to thrive and achieve their strategic objectives in an unpredictable digital age (Armstrong & Lee, 2023).

Innovation: The process of translating ideas or inventions into goods and services that create value or for which customers will pay. In the context of this study, it refers to the introduction of new administrative processes or technologies that improve efficiency and effectiveness (Croitoru, 2012).

Higher Education Institution (HEI): An establishment that provides educational programmes that range between a national qualifications framework level (NQF) of 5 to 10. This goes beyond the school-leaving level which includes universities, colleges, and technical institutes (Department of Higher Education and Training, 2024).

Public Higher Education Institution: An institution of higher learning funded by the government. These institutions are governed by state regulations and policies, and their primary aim is to provide access to education to all people (Department of Higher Education and Training, 2024).

Training Tool Framework: A structured set of guidelines designed to facilitate training and enhance the ability of individuals on a certain topic or area (Travers, Jankowski, Bushway, & Garrison Duncan, 2019).

1.8 Assumptions

The following assumptions underpin this research and are acknowledged as factors that could influence the study's outcomes. These assumptions are deemed reasonable based on the context and scope of the research, and their potential impact on the findings is considered.

The respondents, including administrative staff and management within the selected public higher education institution, will reflect standard perspectives and experiences relevant to digital transformation. This assumption is reasonable because the study targets a diverse group of participants with varying roles and responsibilities, thereby capturing a broad spectrum of insights.

The participants will answer truthfully during interviews. This assumption is critical for the validity of the data collected. It is reasonable to expect honesty given the ethical guidelines and confidentiality assurances provided to participants.

The current levels of digital adoption within the institution are representative of the broader trends in South African public higher education institutions. This assumption is based on preliminary observations and secondary data sources.

It is assumed that digital transformation strategies and digital adoption drivers can effectively enhance administrative efficiency in the selected institution. This assumption is based on existing literature that demonstrates the positive impact of digital literacy and technologies on administrative processes (Hasan, 2023).

1.9 Chapter Outline

This paper aims at exploring the effects of digital transformation strategies on administrative processes in the public higher education institutions in South Africa. First, it seeks to determine the existing problems, challenges to innovation, the level of digital adoption, and the digital skills required for the administrators. Ultimately, the goal is to create a comprehensive training tool that could help fill the digital skills gap, encourage digital adoption, and increase the effectiveness of administrative work.

The background focuses on the increasing role of the digital technologies in the higher education especially during and after the COVID-19 pandemic. Digital transformation has occurred mainly in the academic area while the administrative activities have not been affected much, which results in delays in service delivery. The South African HEIs, which operate under financial constraints, must find their way through these challenges by using flexible digital strategies that focus on accessibility and effectiveness. Thus, integrating technology into the administrative functions of the institutions will help in improving the effectiveness of the institutions in terms of timeliness, costs, and decision making.

The research problem is based on the inefficiencies in the administrative frameworks of the South African HEIs, which are due to a digitally unready workforce, poor technological infrastructure, and resistance to change. Digital transformation can provide solutions such as automation and better data management, but financial constraints and the absence of proper implementation plans are a challenge. To this end, this study aims to examine these challenges and to propose a systematic way of digital transformation in order to achieve effective performance in administration.

The research questions are: (1) What global digital transformation strategies have successfully enhanced administrative efficiency in HEIs? and its impact (2) What are the barriers to digital transformation adoption in South African HEIs? (3) How can these strategies be adapted within a selected institution? The reason for the study is to fill the gap in the literature, which has hardly paid attention to the digital transformation perspective in terms of the administrative layer of the university while most of the studies focus on the academic transformation. The findings of the study will be useful to South African HEIs and other developing countries with similar constraints.

The study is limited to one public HEI in South Africa, thus, excludes private universities and academic transformation. It employs a qualitative research approach, and the interviews with the administrative staff and management are the primary data sources. The research assumes that the participants will tell the truth, that the digital adoption trends present at the institution are typical for the country, and that digital strategies can increase the effectiveness of

administration. For the purpose of this study, the findings are expected to inform policy and practice to help HEIs navigate digital transformation issues and create a more innovative and agile approach to administration.

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

The literature review is important in examining scholarly articles related to the research topic, laying the groundwork for understanding the current knowledge landscape. Rather than simply accepting information at face value. The review aims to assess and analyse essential sources, authors, discussions, ideas, and theories within each relevant field, to ensure the analysis is rigorous. This process helps in identifying existing solutions to the research questions. It is central for there to be clarity and direct alignment, between the research question and the statements put forward.

Firstly, the review will define key terms and provide context to the study. Drawing on recent literature, key terms such as "Digital transformation," "Administrative efficiency," "Innovation," “Digital Adoption,” “Digital competency’” and “Digital Literacy,” will be defined. The background and context will set the tone for the chapter, outlining the significance of digital transformation in the HEI sector and its potential impact on administrative processes. Secondly, strategies for transformation that have been put into practice in higher education institutions worldwide will be explored. The focus will be on identifying practices and understanding their impact in institutional settings as well as the internal and external barriers that impact digital transformation. Case studies from various HEIs globally will be analysed to uncover what factors contribute to digital transformation and how this can be adapted to the South African Context.

2.2 Definition of topic or background discussion

South Africa stands out among African nations for embracing technological advancement in government, businesses, and society. The South African government is actively responding to the opportunities and challenges presented by the 4th industrial revolution through the formulation of policies and strategies

for digital transformation. This is because digital transformation is recognised as a tool with the potential to address human development issues like unemployment, poverty, and socio-economic disparities (Ajigini, 2022).

The journey towards transformation in South Africa began back in 1998 when a presidential review commission identified its importance in reshaping services. Subsequently, the policy decisions and legislative measures have consistently reflected the government's commitment to leveraging technology for growth in documents such as the National Development Plan (NDP) of 2012 the National Broadband Policy of 2013 and the Integrated ICT Policy white paper of 2016. These documents emphasised that South Africa adopted three key pillars (a) digital access (b) digital transformation of government and (c) digital inclusion to bring South Africa into an inclusive society (Telecommunications & Postal Services, 2016).

COVID-19 has significantly accelerated the transformation process in South Africa, underscoring the need to eliminate barriers to advancement and foster growth technologies (Ajigini, 2022). Andreoni et al. (2021) states that in South Africa, digitalisation is taking place within an economy that has undergone deindustrialisation leading to gaps in infrastructure and skills. South Africa failed to diversify its economy and transition toward productivity levels. The country faces rates of unemployment and societal inequality. Nonetheless, despite these obstacles in certain organisations in South Africa, some are capitalizing on the opportunities presented by digitalisation to drive innovation, enhance efficiency, and integrate supply chains effectively (Bell et al., 2018).

Digital transformation in South African Universities is essential for enhancing administrative efficiency, fostering innovation, and ensuring agility within administrative processes (Alvarez-Sández et al., 2023). The concept of transformation has been interpreted in many ways in various literature. Some view it as the integration of information technology, into business operations (Heilig et al., 2017) while others see it as an impactful force that can create chaos in the business landscape (Skog et al., 2018). Additionally, digital transformation is also seen as the implementation of digital innovations within a company (Rodriguez-Abitia & Bribiesca- Correa, 2021). Kanyane (2023) recently argued

that digital transformation refers to the incorporation of technologies, across all aspects of an institution leading to a shift in how it functions and the way it provides value to all stakeholders. This concept goes beyond more than automation and digitisation. It involves reevaluating processes, roles and strategies to make the most of digital technologies (Jimoh & Adenekan, 2024). In educational institutions, digital transformation encompasses the adoption of tools to simplify administrative processes, enhance data organisation and elevate service quality. Instances include the utilisation of cloud computing, data analysis, AI, and mobile technologies all aimed at fostering effective administrative structures (Lubinga, 2023). In essence digital transformation involves the aggregation of all these innovations.

Administrative efficiency refers to using resources, processes, and technologies to reach administrative goals, with minimal waste and maximum impact. It focuses on balancing inputs like time, money, and labour with outputs such, as results or services provided aiming to maximize outcomes while minimizing resources used (Alvarez-Sández et al., 2023). The concept suggests finding a balance between inputs and outputs with the aim of optimising results while using minimal resources. Gunuboh (2023) explored how the evolution of administrative efficiency was originally associated with corporate structures as a key aspect of public administration. The study emphasised that administrative efficiency encompasses allocative effectiveness aiming to boost productivity and simplify operations. This concept, when applied to universities, means achieving maximum educational outcomes with the least resources, which includes effective policy implementation, resource management, and service delivery. Digital transformation greatly boosts the administrative efficiency of universities by automating repetitive tasks, enhancing data handling, and enabling improved communication (Tangmo et al., 2021).

Innovation relates to the creation of ideas, products, services, or approaches that bring about enhancements or offer solutions in unique ways. It involves introducing something or a novel method of accomplishing tasks that add value, boost performance, or establish a competitive advantage (Appio et al., 2021). Digital Transformation requires institutions to innovate and adjust to shifting

market demands, enhance efficiency, and deliver customer experiences. Innovation serves as an element of transformation, by propelling the development and deployment of innovative digital tools, platforms, and procedures that revolutionize business operations. Companies utilise innovation, remain competitive, fulfil evolving customer needs, and attain objectives in an increasingly digitised environment (Berger et al., 2021). Therefore, universities must foster an agile and innovative culture to gain a competitive advantage.

Digital adoption involves incorporating digital tools and technologies into everyday tasks, for both individuals and organisations. It is not about introducing technology; it also entails ensuring that users grasp how to make the most of these tools to reach their goals and enhance efficiency (PricewaterhouseCoopers, 2024). Achieving adoption necessitates a blend of technical expertise user-friendly tools and a company culture that values ongoing learning and adjustment. The role of adoption is pivotal in driving the success of endeavours aimed at transformation (Bozkus, 2023). To truly realise the benefits of transformation users need not only access to new technologies but also proficiency, in utilising them effectively. This proficiency is cultivated through skills and literacy. Understanding how to effectively utilise technologies is crucial, for transformation (Nikou et al., 2022).

Digital competency encompasses the knowledge, skills and attitudes required to navigate digital tools from basic computer functions to advanced artificial intelligence and data analytics. On the hand digital literacy involves the ability to access, interpret, evaluate, manage, and ethically use data. It is not about handling data but also comprehending its significance and utilising it for decision-making processes (Falloon, 2020). Falloon (2020) further argues that the relationship between competency and digital literacy is mutually beneficial. Digital competency equips individuals with skills to operate tools while digital literacy empowers them to make the most of these tools by effectively interpreting and using data. Together they enable both individuals and organisations to navigate the complexities of the evolving landscape.

2.3 Digital transformation strategies in HEIs globally

2.3.1 *Global Digital Transformation Strategies*

Universities and colleges have adopted approaches to drive digital evolution with a focus on a comprehensive digital infrastructure to improve teaching methods streamline operations and enrich the overall student learning journey (Alenezi, 2023). Universities have adopted cloud computing (CC) to boost scalability, mobility, and security. Furthermore, institutions have teamed up with companies like IBM, Microsoft, and Amazon Web Services to offer cloud services. This collaboration has allowed universities to enhance process integration and establish strategies for business continuity. Nevertheless, issues like overseeing third-party clouds and handling related expenses have arisen well (Mohamed Hashim et al., 2022).

As noted by to Mhlanga (2024), the rise of virtual learning technologies was hastened by COVID-19. Universities now employ learning strategies integrating communication, computer-based learning, in person interactions. This method has fostered student networks and promoted collaborative learning spaces. Additionally, virtual learning tools have increased accessibility for students and individuals, with disabilities by minimising barriers and boosting engagement. The pandemic has led to the need for flexible learning methods to bring together students, from locations. Educational platforms based online have been introduced to motivate students to excel in their chosen fields. These platforms combine materials, technical skills and various abilities encouraging student's entrepreneurial spirit. The focus, on self-directed learning has grown amid the pandemic with universities emphasising resources that facilitate this approach (Mhlongo et al., 2023).

AI and big data analytics have an impact on research and education. These advancements offer methods for identifying patterns, creating hypotheses, and improving abilities. They also support customised learning experiences by adapting materials to meet each student's requirements. The incorporation of AI

and big data in universities has played a crucial role for universities striving to maintain competitiveness and foster innovation (Dubey et al., 2019). Universities have been working on improving the quality of education by following accreditation guidelines set by relevant regulatory organisations. These guidelines promote teamwork in decision-making processes. Help make operations more efficient ultimately leading to better choices and ongoing enhancements. The focus, on quality, has also prompted education institutions to embrace teaching approaches that value creativity, critical thinking, and interdisciplinary learning. Many studies show that a lot of educational institutions do not have a defined vision and strategy for digital transformation. To successfully transform it is important to have guidelines, strategies, and plans that are effectively communicated throughout the organisation. Bringing in experts in transformation and securing support from management are key factors, in addressing resistance to change and making digital transformation sustainable (AlNuaimi et al., 2022).

As much as infrastructure, digital tools and technology, strategy, and partnerships are essential for digital transformation, without digital skills, staff might find it challenging to grasp and implement technologies resulting in lost chances to improve the quality of services offered to the public (David et al., 2024). Companies have been ensuring that they have proficient staff and leaders to unlock their transformative potential (Nadkarni & Prugl 2020). organisations are now required to ensure that they upskill their workforce to be digitally competent to thrive in the digital age and compete with competitors (Gautam, 2018). Thus, the synergy of expertise and technological advancements is crucial, for digital transformation.

These digital initiatives have empowered institutions to stay competitive, creative, and adaptable in the changing environment.

2.3.2 *Case Studies of Successful Implementations*

To improve delivery, operational efficiency and student experience, higher education institutions (HEIs) have put into practice a range of transformation

strategies. Here are specific instances showcasing how various institutions have embraced these approaches.

Case Study 1: Prince Sultan University (PSU)

Prince Sultan University (PSU), in Riyadh, Saudi Arabia is known for its commitment to preparing students for the challenges of today's world. With a focus on transformation PSU has launched multiple programmes to improve education quality through the integration of technology. The digital transformation journey at PSU began with a rounded strategy aimed at incorporating technology into all aspects of university operations. A key component of this strategy was the development of an online learning management system (LMS), e-textbooks and digitised library, smart whiteboards to improve the overall teaching and learning experience. These revolutionized teaching methods making them more interactive and dynamic.

Another aspect of PSU's initiatives is the digitalisation of campus services. They have implemented registration, fee payment and scholarship applications to make these administrative processes more convenient for students. These online services have streamlined tasks making it easier for students to manage their affairs. PSU has actively encouraged a culture of innovation and creativity among its stakeholders, staff, and students. By promoting involvement in projects like creating apps and designing websites the university creates an environment where students can apply their technical skills practically. Additionally, PSU offers programming and design courses to equip stakeholders with skills needed in today's workplace.

A significant part of PSUs transformation involves integrating technological platforms. The Information Technology Center (ITC) has developed over 40 web services as an integration layer to facilitate communication and data sharing, among systems. This system connects the Student Information System (SIS) and the LMS automating their interaction to send data to a data repository, for Key Performance Indicator (KPI) evaluations. Staff also have access to a platform that combines services and data covering growth opportunities and research

integration with external databases like Scopus and Web of Science (Alenezi & Akour, 2023).

The successful execution of transformation efforts at PSU emphasises the significance of integrating technology in higher education. Through building infrastructures promoting an innovative culture and prioritising stakeholder requirements PSU has established a sustainable blueprint, for digital advancement.

Case Study 2: King Saud University (KSU)

King Saud University began its Digital Transformation (DT) journey in the 1950s, focusing on enhancing processes streamlining workflow efficiency, and nurturing a climate of innovation and adaptability long before this study took place. The university shifted from paper-based systems to automated processes, including digitising faculty requests and administrative approvals. The success of transformation at KSU was greatly influenced by the backing of leadership. Senior executives played a role in recognizing the importance of digitalisation, providing technical resources, and guiding the organisation through the transformation journey. This support was key in overcoming resistance to change and ensuring the implementation of digital systems.

Digital transformation efforts at KSU necessitated a culture change and employee involvement. The university's leadership introduced standards and beliefs fostering a culture that valued employee contributions and promoted enhancement. This cultural shift was vital for creating an environment for leveraging technologies for improved performance. Involving employees in the transformation process proved to be crucial for success. KSU adopted an approach where staff feedback was actively sought and integrated into decision-making processes. This approach not only reduced resistance to change. Also empowered employees to play a role in shaping and refining digital initiatives. Ensuring that employees had the skills to effectively utilise digital systems emerged as another critical factor. KSU made investments, in training programmes to ensure their staff were well equipped to handle and maintain

technologies. This focus on developing capital played a role in the university's successful transition to digital operations.

Incorporating accountability and performance measurement was also an aspect of KSUs transformation journey. By establishing performance metrics and accountability structures through goals and Key Performance Indicators (KPIs) the university could track progress effectively ensuring that digital efforts led to measurable improvements in performance and efficiency.

The digital transformation initiatives at KSU yielded results, including productivity and efficiency. The implementation of systems streamlined processes, reducing time requirements, and enhancing information management accuracy. Furthermore, fostering a culture that values employee input and promotes innovation, fostered engagement and collaboration among staff members. Furthermore, KSUs experience highlights the role of leadership in driving transformation and aligning technological advancements with organisational culture. The insights gained from this case study offer lessons, for universities and organisations embarking on similar digital transformation journeys emphasising the significance of top management support, cultural alignment, employee engagement and ongoing training initiatives (Almatrodi & Skoumpopoulou, 2023).

In summary, King Saud University's successful execution of transformation initiatives exemplifies the impact such endeavours can have on organisational culture. By creating a nurturing atmosphere, involving staff members, and prioritizing skill enhancement, KSU successfully managed the challenges of transformation. The insights gained from KSU’s journey offer guidance for organisations seeking to utilise tools to improve their operations and corporate ethos.

Case Study Comparison

To illustrate how global digital transformation strategies are applied in practice, the table below compares two leading institutions Prince Sultan University (PSU) and King Saud University (KSU).

2.1 Comparative Summary of Digital Transformation Initiatives at Prince Sultan University (PSU) and King Saud University (KSU)

Dimension	Prince Sultan University (PSU)	King Saud University (KSU)
Focus Areas	LMS development, digitised library, integrated campus services	Paperless workflows, digitised faculty approvals
Leadership Role	ITC guided system integration, promoted innovation culture	Senior executives drove change and staff engagement
Staff/Student Involvement	Encouraged app-building, programming projects	Solicited feedback, co-created processes
Outcomes	40+ web services, seamless SIS–LMS integration, KPI reporting	Reduced process times, improved accuracy, strong engagement culture
Key Lesson	Build infrastructure & culture simultaneously	Leadership + culture + training = transformation success

2.3.3 *Proposition 1*

Implementing comprehensive digital transformation strategies, including cloud computing, virtual learning technologies, AI, big data analytics, and adherence to quality and accreditation standards, significantly enhances operational and administrative efficiency, educational quality, and student experience in higher education institutions. This is evidenced by successful implementations at institutions such as Prince Sultan University and King Saud University, which highlight the importance of leadership support, cultural shifts, and continuous training.

This proposition encapsulates the key elements and benefits of digital transformation strategies in higher education, drawing from both the literature review and case studies to illustrate the practical outcomes and essential factors for successful implementation.

2.4 Barriers to digital transformation

Embracing digital transformation is crucial for universities as they strive to incorporate cutting edge technologies into their systems and processes to improve overall efficiency (Jayabalan et al., 2021). However, the road to achieving digital maturity is filled with obstacles that may impede progress. These

challenges can be broadly categorised as internal and or external barriers which need to be recognised and tackled to foster digital transformation.

This section offers an examination of these hurdles drawing insights from various studies to delve into the factors that hinder efforts towards digital transformation in higher education institutions. The internal barriers include transformational leadership, cultural resistance, resistance to change, inflexible organisational structures, institutional support and resources, lack of expertise or skills and insufficient training opportunities. Following these challenges, is an exploration of external barriers which are outside the control of institutions such as technological and infrastructural constraints, financial limitations, and regulatory hurdles. By pinpointing and comprehending these obstacles the aim of this section is to contribute towards crafting strategies that can effectively support digital transformation in the higher education sector.

2.4.1 *Internal barriers to digital transformation*

Internal barriers to digital transformation are often rooted in the leadership, culture of an institution, resistance to change, structure and culture, employee competencies, training inadequacy and institutional support and resources. One significant challenge often noted in literature is the lack of leadership in universities.

a. *Lack of Effective Leadership*

Du Plessis, Bock and Keyter (2024) states that effective leadership is crucial for facilitating the shift towards technological advancement. Transformative leadership plays a role in addressing resistance to change an obstacle faced by many educational institutions. Leaders who can motivate, inspire, and steer their organisations through the complexities of integrating technologies are essential for digital progress. This viewpoint aligns with transformational leadership theory, which highlights the importance of leadership in propelling change (Bass & Riggio, 2006). Transformative leaders are known for their ability to envision the future, inspire followers to surpass their perceived boundaries and cultivate an environment that embraces change and creativity. While transformative

leadership is indispensable it must be complemented by tactics and ample resources to ensure implementation. Without these components, even the forward-thinking leaders may encounter challenges in instigating meaningful transformation.

b. *Change Management*

In addition to facing leadership challenges, dealing with change management processes within organisations can pose obstacles especially in the attempts to address resistance to change. Labuschagnes (2024) research sheds light on the procedural and administrative challenges that may arise during such transitions. Effective change management is often hindered by issues like communication, inadequate training and resistance from employees who are used to common methods. Change management theories stress the importance of communication and engaging stakeholders (Kotter, 1996). Nonetheless the complexities within higher education institutions often call for flexible approaches. The idea that changes management progresses in a linear process fails to consider the nature of digital transformation in these settings. Successfully navigating change in this scenario demands an understanding of the culture and a readiness to adjust strategies as required. Furthermore, involving all stakeholders including faculty members, administrative personnel and students is essential, for creating an atmosphere to change.

c. *Organisational Structure and Culture*

The way an organisation is structured can have an impact on whether digital changes can happen or face obstacles. The usual top-down structures can slow down the adaptability needed for change, causing delays in decision-making, and blocking the sharing of information between parts of the organisation (Firican, 2023). This inflexibility stops decision- making power from being passed down to levels which is important for fostering a culture of accountability and agility. Additionally, when information does not flow easily within the organisation, it can create silos which make it even harder to push transformational efforts (Firican, 2023).

Firican (2023) argues that organisational culture plays a critical role in digital transformation, often acting as either an enabler or a barrier. A deeply entrenched organisational culture that resists change can make it difficult for new digital practices and mindsets to take hold. This resistance is frequently driven by fear of the unknown and discomfort with new technologies, leading to reluctance among employees to embrace digital initiatives (Firican, 2023). The absence of a supportive digital culture, characterized by collaboration, agility, and innovation, further hampers transformation efforts. Without such a culture, the necessary responsiveness and rapid decision-making required for successful digital transformation cannot be achieved (Firican, 2023).

d. *Skills Gap and Training Limitations*

A significant internal challenge arises from the skill gaps among employees and decision- makers. Research by Uzule and Verina (2023) highlights the lack of competencies in the workforce poses a hindrance to digital transformation which in turn affects an institutions administration to operate efficiently. Many organisations face difficulties in finding staff members with the required skills to lead transformation initiatives further complicated by the lack of comprehensive training programmes. These programmes often fall short in preparing employees to navigate the complexities of technologies making it tough for organisations to keep pace with rapid technological advancements (Uzule & Verina, 2023). Consequently, employees may struggle with using tools and systems due to a lack of confidence and proficiency.

Fear of failure and a lack of trust in technologies are obstacles that add to the difficulties of digital transformation. These barriers often stem from past experiences where technology projects may have failed, creating a reluctance to embrace new digital solutions. Moreover, the intricate nature of IT systems and the subpar user friendliness of tools can heighten these concerns causing employees to be cautious about adopting technologies (Uzule & Verina, 2023). Overcoming these hurdles necessitates not only technical training but also endeavours to cultivate trust and confidence among staff in the advantages and user friendliness of new digital tools.

e. ***Institutional Support and Resources***

Lastly, a major challenge from within is the backing and resources provided by institutions. Zulfikar (2024) points out that financial limitations pose an obstacle to embracing changes as many higher education institutions face budget constraints. These restrictions impede their capacity to invest in the required framework and training schemes leading to a slowdown in the adoption of practices. This issue is especially prevalent in developing nations, where economic hardships worsen the situation (Zulfikar, 2024). Adequate financial support plays a role in facilitating aspects of digital transformation, such, as acquiring new technologies enhancing staff's digital skills and upkeeping digital infrastructure. Without backing even well- meaning digital endeavours are unlikely to thrive.

Therefore, it can be argued that digital advancements in the realm of higher education, encounter internal obstacles such as leadership hurdles, reluctance towards change, organisational frameworks and insufficient employee competencies and development. Effective transformative leadership is essential, but it needs to be complemented by change management practices, a supportive environment, and ample resources. The rigidity of organisations, rooted cultures resistance to change and skill gaps among personnel hinder progress within an institution. Financial limitations, particularly in developing nations worsen these challenges by restricting investments in infrastructure and training initiatives. Overcoming these hurdles necessitates an approach involving leadership qualities, flexible strategies, and robust institutional backing to thrive in the digital age.

2.4.2 *External barriers to digital transformation*

Digital transformation in public higher education institutions (HEIs) is an intricate process that involves not just internal adjustments but also overcoming significant external hurdles. External barriers, while outside the institutions immediate control, plays a critical role in determining the success of digital transformation efforts. Recognising and addressing these obstacles is crucial for devising strategies to bolster digital transformation. This section consolidates insights from

recent studies to critically assess the external barriers encountered by HEIs focusing on policy and regulatory restrictions, readiness of the technological landscape and economic circumstances. Tackling these challenges necessitates a holistic approach encompassing policy revisions, investments in technological infrastructure and securing financial backing to advance digital projects. By acknowledging and mitigating these obstacles HEIs can cultivate an environment to digital transformation ultimately realizing their overarching objectives of innovation and operational efficiency, in higher education.

a. *Policy and Regulatory Restrictions*

One major obstacle described in the literature is how policy and regulatory restrictions affect transformation. Marzougui, Attou and Arouch (2024) highlight that slow and cumbersome regulatory processes, as seen in Moroccan universities, often delay the implementation of new technologies. This aligns with institutional theory, which holds that organisations are shaped by the rules and norms of their institutional environment (Scott, 2004)

. Government policies can either facilitate or constrain transformation efforts. The implementation of data protection and cybersecurity regulations protects consumer information, yet these rules create extra compliance requirements that slow down digital adoption. Further obstacles include limited government support, bureaucratic red tape, and high import tariffs, which together restrict investment in new digital technologies (Trevisan et al., 2023). Therefore, supportive policies that include fast technology approval systems and flexible rules for innovation and adaptive regulatory frameworks that adapt to quick technological developments are required to support digital transformation efforts.

b. *Technological Infrastructure*

As outlined by Trevisan et al. (2023) the absence of up-to-date IT tools, models, infrastructure, and cybersecurity measures can significantly impede any organisations adoption of technologies. The rapid pace of advancements often leaves organisations struggling to keep pace with the tools and systems making it challenging to incorporate new technologies into existing processes. Additionally, issues concerning data processing and integration along with the

challenges of IT systems add complexity to the journey of transformation (Trevisan et al., 2023).

The success of projects depends on having a supportive external technological setting that offers the necessary tools and advancements (Kreuzer, 2024). The ability of the market to provide these tools along with the university's capacity to incorporate them greatly influences the success of transformation endeavours. This emphasises the significance of having a technological infrastructure and a market capable of meeting the demand for innovative digital solutions. The theory of determinism posits that technological progress propels social change (Chandler, 2000). Trevisan et al. (2023) further add that the absence of up-to-date IT tools, models, infrastructure, and cybersecurity measures can significantly impede any organisations adoption of technologies. The rapid pace of advancements often leaves organisations struggling to keep pace with the tools and systems making it challenging to incorporate new technologies into existing processes. Additionally, issues concerning data processing and integration along with the challenges of IT systems add complexity to the journey of transformation (Trevisan et al., 2023).

Thus, the availability and accessibility of advanced technologies are pivotal for the digital transformation of public HEIs. In areas where the technological ecosystem is less developed, universities may face challenges in accessing the tools and resources needed for their digital projects. This underscores the importance of investing in infrastructure and nurturing local markets to ensure that universities have access to the necessary innovations for digital transformation. Market forces such as competition and customer expectations also impact transformation initiatives. Verhoef et al. (2021) point out that organisations feel pressured to adopt technologies to stay competitive with industry leaders. Nevertheless, the stress can sometimes backfire, pushing companies to embark on digital transformation efforts without thorough planning or regard for future consequences. Additionally, as customer demands for digital interactions keep increasing organisations are under more pressure to embrace cutting edge digital tools (Verhoef et al., 2021).

c. *Financial Constraints*

Financial limitations pose an obstacle to digital transformation efforts. To embark on innovative initiatives organisations typically need to invest heavily in new technologies, infrastructure, and training schemes. However, based on the work of Uzule and Verina (2023) many companies lack the financial means to make these essential investments. The substantial costs associated with transformation which encompass acquiring new technologies and restructuring business operations can be prohibitive, especially in sectors with narrow profit margins (Uzule & Verina, 2023). Moreover, the paradox of digitalisation where investments in transformation do not immediately translate into revenue growth can dissuade organisations from allocating the required resources towards these initiatives (Uzule & Verina, 2023).

Economic circumstances and funding availability influence digital transformation within Higher Education Institutions (HEIs). Inah, Ekpang and Uzoigwe (2024) explain how limited funding from sources and external entities limits institution's ability to invest in digital infrastructure and innovation. This challenge is particularly common in developing nations where economic constraints are more pronounced. The scarcity of resources exacerbates other obstacles making it challenging for institutions to keep up with technological advancements. Economic theory suggests that financial limitations can significantly impede an organisations capacity to invest in technologies and processes (Solow, 1957).

Therefore, securing funding is crucial for driving various aspects of digital transformation such as acquiring new technologies, enhancing digital skills among employees, and maintaining digital infrastructure. Without financial backing even well-planned digital projects are unlikely to thrive. Furthermore, external economic factors can impact the stability and capability of higher education institutions (HEIs) in pursuing digital transformation. Economic downturns or financial crises may result in budget cuts. Reduced funding for educational establishments further impeding their ability to invest in digital tools. This poses a challenge for public HEIs that heavily depend on government support. On the contrary regions experiencing economic growth and reliable

funding mechanisms are more likely to have the financial means to bolster their digital transformation endeavours.

Additionally, it is essential to consider the role of funding and partnerships in this context. Inah et al. (2024) emphasises the significance of funding sources like international grants and collaborations in driving digital transformation initiatives. These external avenues can offer financial assistance and expertise to help institutions overcome local economic limitations. Nevertheless, reliance on funding presents its own challenges, including meeting donor criteria and potential interruptions, in funding flow.

In conclusion, digital transformation in public higher education institutions (HEIs) is a multifaceted process influenced by both internal dynamics and significant external barriers. These external challenges, such as policy and regulatory constraints, technological ecosystem readiness, and economic conditions, impact the success of digital initiatives. Addressing these barriers requires a comprehensive approach that includes policy reforms, investment in technological infrastructure, and securing adequate financial resources. Without overcoming these obstacles, HEI's may struggle to fully realise their digital transformation goals, ultimately affecting their ability to innovate and maintain operational efficiency in an increasingly digital world. Recognising the complexities of these external factors is essential for developing effective strategies that enable HEI's to navigate the digital transformation journey successfully.

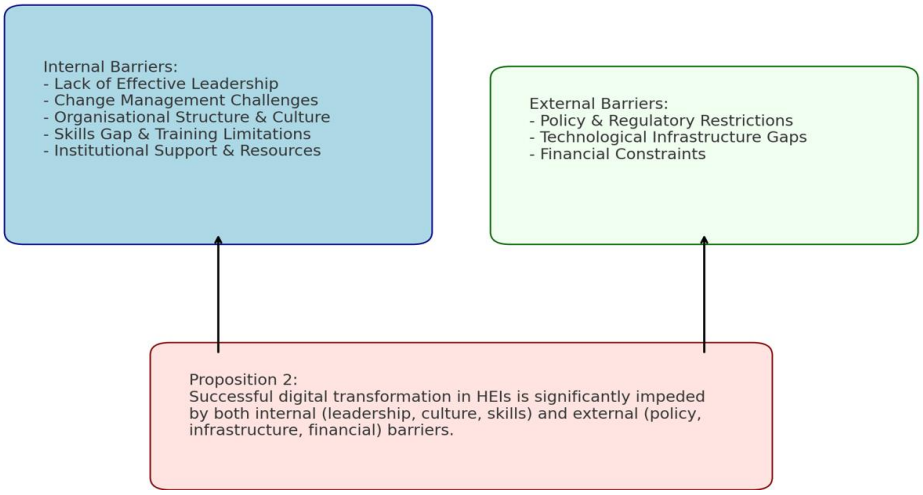
2.4.3 *Proposition 2*

The successful digital transformation of higher education institutions is significantly impeded by both internal barriers such as leadership challenges, cultural resistance, and insufficient skills and external barriers such as regulatory constraints, inadequate technological infrastructure, and financial limitations.

The proposition presented is rooted in the literature examined highlighting issues surrounding the obstacles encountered by universities as they strive to adapt digitally.

Figure 2.3 below illustrates Proposition 2, which emphasises that successful digital transformation in higher education institutions is hindered by a combination of internal and external barriers. Internal barriers include leadership challenges, organisational culture, change management difficulties, and limitations in skills and resources, while external barriers arise from policy and regulatory restrictions, technological infrastructure gaps, and financial constraints. Together, these factors interact to constrain the capacity of institutions to fully realise the benefits of digital transformation. The diagram provides a visual summary of how these barriers converge to shape the challenges identified in this study.

2.3 Barriers to Digital Transformation in Higher Education Institutions



2.5 Adapting digital transformation strategies for public higher education institutions

As part of the research objective of understanding strategies that improve digital maturity in South African public HEIs, three theoretical frameworks are particularly valuable: Change Management Practices, Digital Transformation Frameworks, and Lean Thinking Principles. These, in combination, provide comprehensive guidance for successful digital adoption in complex, resource-constrained educational environments.

a. *Change Management Practices*

It is important to emphasise that effective change management is a critical factor in the success of digital transformation in public higher education institutions (Errida & Lotfi, 2021). To effectively navigate the complexities involved, institutions must address several key areas: resistance to change, digital skills gap, training, leadership, cultural change, and risk management.

Resistance to change is one of the greatest challenges that institutions encounter when implementing digital transformation. It is not easy to change the behaviour of employees when they are comfortable with the current ways of working. This is particularly the case in the context of South Africa where technology access and digital literacy differences between employees are significant (Svensson, Antony & Ba Essa, 2015). Work culture, together with low digital exposure, results in hesitation and fear of implementing new digital tools and processes in the workplace. These include Kotter's 8-step Change Model, which provides structured ways of addressing these resistances, which include providing clear communication, creating urgency, forming guiding coalitions, and enabling broad action (Trawick & Carracher, 2023).

To this end, effective addressing of resistance requires training programmes that are specifically targeted to closing the existing skills gap. Comprehensive training initiatives that are targeted at the digital literacy levels of administrative staff can help to reduce fear, increase confidence and provide employees with the necessary digital skills. The importance of ongoing training and support is not only to assist with the initial transition but also to nurture a culture of learning that is crucial for the long-term integration of digital (Colombari & Neirotti, 2022).

Leadership is indispensable in the process of leading an organisation through the digital transformation. Leaders are expected to provide a clear vision, gain the organisation's support and encourage it to change and learn, and develop an organisational culture of innovation and change. This is because leadership is the most significant factor that determines the level of organisation's technology adoption, and therefore, induces employees to change proactively due to the

manifested organisation's attitude towards the new technologies (Du Plessis, Bock & Keyter, 2024).

Furthermore, the institution must ensure the effective implementation of risk management to mitigate the risks that come with any change management process. This entails regular risk analysis, the identification of possible risks, the involvement of various stakeholders, and the existence of plans to address the risks that are likely to be encountered in the process of digital transformation (Romero et al., 2019).

Through leadership-inspired change management, specific training measures, proper risk management, and the promotion of a culture of continuous improvement, the public higher education institutions in South Africa are in a better position to enhance their effectiveness in the process of digital transformation.

b. *Digital Transformative Frameworks*

In today's world universities worldwide are focusing on modernising through transformation. By embracing tools and technologies these institutions are changing how they operate and provide services. This shift opens opportunities to improve efficiency, make data driven decisions and promote teaching methods (Benavides et al., 2020). For African public universities dealing with challenges like limited infrastructure and varying digital skills, digital transformation is both a hurdle and a chance for growth. By integrating tools strategically to meet their specific needs these universities can overcome operational barriers and align with successful global practices. It is crucial that the adoption of tools is tailored to the university's requirements to ensure it effectively enhances administrative processes (Chen et al., 2023).

Combining lean principles with digital technologies through Lean Digital Transformation, offers an effective framework for streamlining administrative processes in higher education institutions. This approach merges management strategies with digital tools to achieve increased efficiency and agility. For example, utilising techniques such as value stream mapping alongside real time data analytics provided by digital tools can significantly improve operations

(Cifone et al., 2021).Various real-world examples illustrate how effective this method can be. For instance, a university in the UK used Lean Six Sigma to streamline processes and boost efficiency in administration, a strategy that could be beneficial in South Africa well (Antony, Ghadge, & Ashby, 2018). Similarly, the implementation of office techniques at a postgraduate office within a university resulted in significant enhancements in productivity and waste reduction indicating that South African higher education institutions could achieve similar positive outcomes (Magalhães et al., 2019). Even though the advantages of Lean Digital Transformation are clear bringing these approaches into practice within universities in South Africa demands thoughtful consideration of local obstacles.

c. *Lean Thinking Principals*

Initially developed in the manufacturing industry, Lean management emphasises waste elimination, process enhancement and value maximization using resources. These principles have been successfully tailored for the education context where they are utilised to streamline administrative functions cut costs and improve service quality (Vukadinovic et al., 2017). In African public HEIs facing budget constraints and mounting pressure for efficiency and transparency, implementing Lean principles could be transformative. By identifying and removing non-value-added tasks these institutions can redirect resources towards more essential endeavours, ultimately enhancing overall institutional effectiveness. The positive outcomes observed from applying lean management principles in various educational environments suggest that South African HEIs could likewise experience advantages from adopting this approach (Romero et al, 2019).

The integration of Lean principles with digital tools has gained popularity as a strategy to boost administrative efficiency and promote a culture of continuous improvement in higher education institutions (HEIs) globally. This approach, referred to as Lean Digital Transformation, has proven effective in streamlining processes reducing inefficiencies and fostering innovation within settings. With public HEIs in South Africa aiming to align with global best practices and address their specific challenges, embracing these strategies provides a practical route toward achieving their objectives.

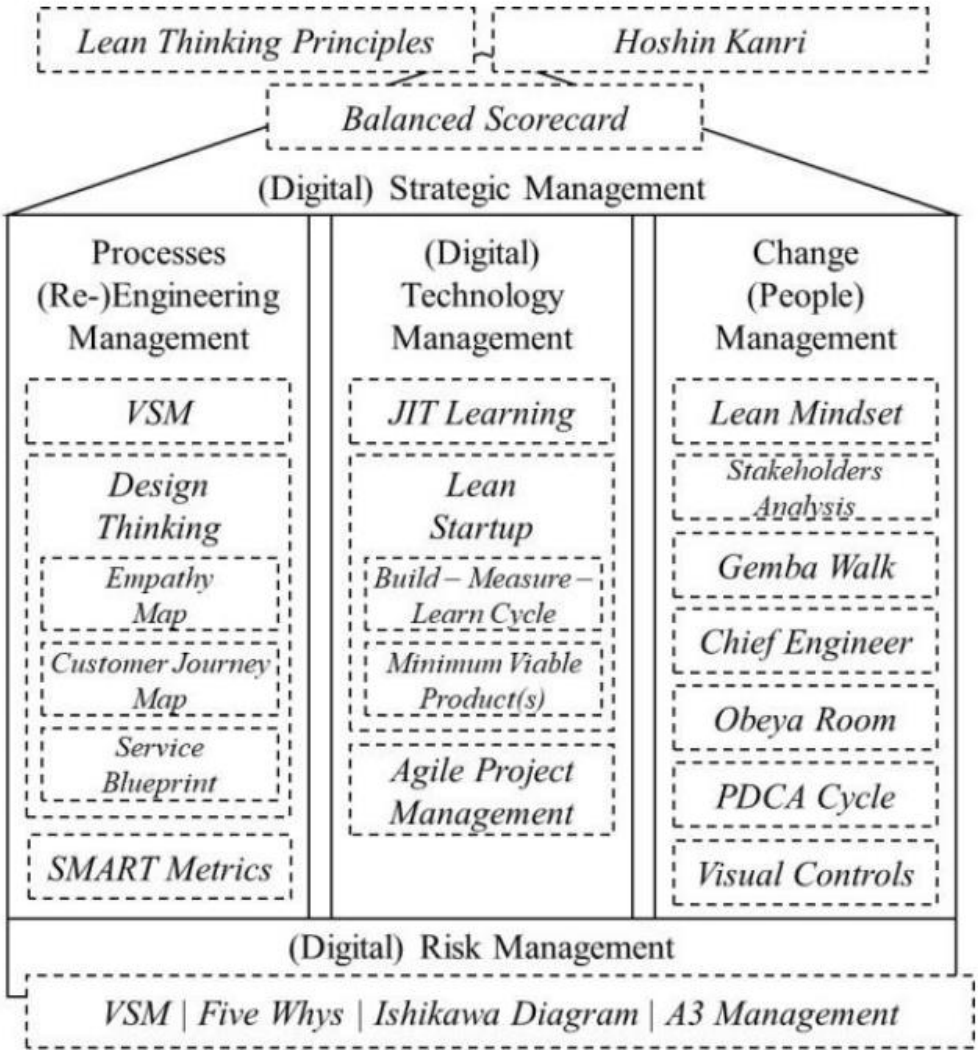
d. *Digital Lean Transformation Framework*

The alignment of Change Management, Digital Transformative Frameworks, and Lean Thinking Principles to the institution leads naturally to the Digital Lean Transformation Framework this is demonstrated in Figure 2.1 below. This holistic framework is structured around five key management pillars: Digital Strategic Management Processes Re-Engineering Management, Digital Technology Management, Change People Management and Digital Risk Management. As for the latter, these pillars are selected due to their common use in strategic management and integrate Lean practices and digital tools to provide comprehensive guidance for digital transformation (Romero et al, 2019).

The Digital Lean Transformation Framework aligns Lean methodologies with the industry 4.0 vision strategically. It is steered by foundational assumptions that include the following: firstly, digital strategies should move beyond the mere digitisation of processes and practices and instead seek innovation, better efficiency, and more value creation. Secondly, processes must be standardised and then digitally enabled to leverage the full potential of the digital environment. Thirdly, technology is known to not be able to fix poorly designed or designed poorly processes and, if used incorrectly, may worsen the outcome. Fourth, digital transformation is always socio-technical, which means that everyone must be actively engaged and empowered in the process. Lastly, uncertainty is inherent in any change management effort, and therefore, risk management should be approached in a systematic way (Romero et al, 2019).

In this manner, South African public HEIs can stand to benefit greatly from this comprehensive framework, which entails strong change management, proper digital transformation frameworks, Lean methodologies, and risk management. This way, institutions can not only deal with the existing operational inefficiencies but also develop a sustainable innovation and improvement culture. While Romero et al.'s (2019) Digital Lean Framework offers strong operational benefits, it lacks sufficient insights on emotional barriers to change, thus underscoring the need for complementary psychological frameworks should institutions implement this framework.

Figure 2.1 Digital Lean Transformation Framework (Romero et al, 2019)



Therefore, merging lean principles with digital tools offers a significant opportunity for public higher education institutions in South Africa to improve administrative efficiency and align with global standards. By adopting strategies from around the world these institutions can tackle current inefficiencies, promote digital integration, and nurture a culture of continual enhancement. However, it is crucial to customise the implementation of these strategies to fit the context of South Africa considering challenges related to digital literacy and managing change. As African public higher education institutions navigate the complexities of digital evolution drawing insights from global practices will be essential in guiding their journey and ensuring they fully leverage the benefits of Lean Digital Transformation.

2.5.2 *Proposition 3*

Given the critical role of Lean Digital Transformation in enhancing administrative efficiency and aligning with global best practices, South African public higher education institutions that strategically integrate Lean principles with digital tools, while addressing local challenges such as resistance to change and the digital skills gap, are likely to achieve significant improvements in operational effectiveness and foster a culture of continuous improvement.

2.6 Analytical framework

A structured analytical framework that combines conceptual perspectives plays a crucial role in comprehending, dissecting and interpreting research dilemmas or occurrences. The theoretical framework acts as a perspective through which the study is examined, utilising established theories to elucidate the reasons behind phenomena, thereby shaping the research inquiries, suppositions, and methodology (Creswell, 2013). Additionally, the conceptual framework delineates concepts, variables, and interconnections pertinent to the investigation structuring the research emphasis and guaranteeing that all relevant elements are considered (Miles, Huberman, & Saldana, 2014). These frameworks collectively establish an intellectual foundation for the research endeavour by directing data collection processes; facilitating analysis and interpretation; and laying groundwork, for drawing inferences and offering suggestions.

2.6.1 *Theoretical Framework*

The study on digital transformation in South African public higher education institutions is guided by a solid theoretical framework rooted in established theories widely recognised in academic literature. This framework organises ideas systematically, analysing the relationships among variables like leadership, organisational culture, regulatory frameworks technological infrastructure and lean practices to offer a thorough understanding of the research problem.

At the heart of this framework is Transformational Leadership Theory emphasising the role of leadership in driving organisational change.

Transformational leaders, as per Bass and Riggio (2006) play a role in motivating teams to prioritise organisational goals over personal interests. In the realm of transformation such leadership is crucial for overcoming resistance to change, fostering innovation, and navigating the complexities of integrating new technologies into institutional processes. The study focuses on examining how leadership can effectively lead these changes as the success of Lean Digital Transformation in African public HEIs hinges greatly on leaders' ability to initiate and sustain these efforts.

In addition to this, Institutional Theory highlights how institutions are influenced by the rules, norms, and regulatory frameworks in which they operate. As stated by Scott (2004) the institutional environment encompassing government policies and existing technological resources shapes the success of digital transformation endeavours in public higher education institutions (HEIs). This perspective acknowledges that external factors can either facilitate or hinder progress underscoring their significance in the evaluation process. For African public HEIs factors such as regulatory frameworks, technological resources and socio-political conditions are key determinants of how efficiently these institutions can introduce and maintain digital transformation projects.

Moreover, Kotter's Change Management Theory (1996) is integrated into the framework to offer an approach to implementing successful organisational changes. Kotter's theory outlines a series of steps that emphasise the importance of communication, engagement with stakeholders and strategic planning to overcome internal barriers like resistance to change, lack of skills and inflexible organisational structures. This theory is highly relevant to this study as it provides a roadmap for assessing how well public HEIs in South Africa navigate change processes and adapt to the demands of digital transformation. The framework integrates Kotter's principles to evaluate the efficacy of change management strategies adopted by these institutions ensuring that the transformation journey remains inclusive and sustainable.

Chandler (2000) outlines the significance of Technological Determinism Theory, highlighting how technological advancements drive organisational changes. In the realm of education, embracing advanced technologies is crucial for achieving

digital transformation. Investing in technology infrastructure and promoting innovation are aspects emphasised in this framework recognizing the pivotal role technology plays in an institutions ability to adapt and excel in a digitally evolving landscape. Particularly for African public higher education institutions facing infrastructure and access challenges strategic investments in technology are essential for facilitating effective transformation.

Incorporating Lean Management Theory and Digital Transformation Theory into the framework offers an approach to enhancing administrative efficiency at South African public HEIs through Lean Digital Transformation. Lean Management Theory, centred on waste reduction and process optimisation provides an approach, to enhancing institutional operations (Womack, Jones, & Roos, 1990). When Digital Transformation Theory is coupled with lean practices and with the integration of digital tools into organisational processes (Bharadwaj et al., 2013) it offers a valuable perspective to assess how South African higher education institutions can align with global best practices.

The use of multiple theories and concepts in this study was intentional to ensure a comprehensive and well-rounded analysis of the research problem. No single theoretical framework could fully capture the complexity of the topic, making it necessary to integrate different perspectives. By drawing on multiple theories, the study benefits from diverse insights, bridges conceptual gaps, and enhances the depth of analysis. This approach also allows for a more interdisciplinary understanding, ensuring relevance across different contexts. Furthermore, comparing and integrating various theories provides a more nuanced interpretation of findings, making the research more applicable to real-world challenges. Ultimately, this multi-theoretical approach strengthens the study's contribution to academic discourse and provides a more holistic understanding of the subject matter and how they are connected.

This theoretical foundation not only positions the research within existing literature but also provides a systematic examination of the relationships among leadership organisational culture, regulatory frameworks, and technological infrastructure. By guiding the research process, this framework ensures that the study is based on a comprehension of these factors, thereby boosting the

credibility and reliability of the findings. This framework shapes the creation of strategies to tackle identified challenges and achieve digital transformation in South Africa's higher education sector. It provides a worldview directly tied to the research issue. This approach helps position the researcher and contextualise the theories informing their work, providing a crucial foundation for exploring the complexities of Lean Digital Transformation in public higher education institutions. By organising and integrating various theories, this framework not only guides the research process but also ensures that it is firmly grounded in established theoretical perspectives, thereby enhancing its overall rigour and validity.

2.6.2 *Conceptual Framework*

The study's conceptual framework aims to narratively illustrate the main variables and constructs that will be examined to understand the effective implementation of Lean Digital Transformation in public higher education institutions (HEIs) in South Africa. Drawing from theoretical foundations such as Transformational Leadership Theory, Institutional Theory, Change Management Theory, Technological Determinism, Lean Management Theory and Digital Transformation Theory outlined in the preceding section this framework offers a structured approach to investigating the research problem through in-depth qualitative inquiry by delineating the connections between critical themes and guiding the research process.

At the core of this framework lies the central research focus on Administrative Efficiency in Public HEIs. This represents the goal sought through implementing Lean Digital Transformation strategies. The objective is to uncover how and why different factors contribute to enhancing processes, minimising waste, and improving overall efficiency within South African public HEIs through rich, qualitative insights.

Surrounding this outcome are a set of key constructs, which will be qualitatively explored:

- **Transformational Leadership:** This construct emphasises leaderships role in fostering change and innovation. It involves leaders' capacity to inspire their teams, address resistance to change and navigate the complexities of transformation (Bass & Riggio, 2006). The suggested connection here is that effective transformational leadership has an impact on the successful integration of Lean Digital Transformation methods resulting in enhanced operational efficiency.

- **Institutional Context:** Drawing from Institutional Theory, this concept encompasses elements like government regulations, policy frameworks and technological setups (Scott, 2004). These elements can facilitate or impede the digital transformation journey. The theory suggests that a supportive institutional context promotes the execution of Lean Digital Transformation initiatives thereby boosting operational efficiency.

- **Change Management Practices:** This idea is rooted in Kotter's Change Management Theory (1996) which outlines the steps for implementing organisational changes successfully. Essential components include communication, stakeholder involvement and strategic planning. It is believed that executed change management procedures help mitigate internal resistance and facilitate smooth transitions thus aiding in achieving operational efficiency.

- **Technological Infrastructure and Access:** Building on Technological Determinism (Chandler, 2000), this concept underscores the influence of advancements and access to digital resources on Higher Education Institutions capacity to implement transformative strategies. The framework asserts that robust technological infrastructure and accessibility play roles in enabling Lean Digital Transformation efforts leading to enhanced administrative processes.

- **Lean Management Practices:** involve implementing principles like reducing waste and optimising processes in the administrative settings of higher education institutions (Womack, Jones, & Roos, 1990). The idea is

that applying management practices alongside digital tools can lead to notable enhancements in administrative efficiency.

- **Digital Transformation Initiatives:** This covers the digital tools, technologies and procedures adopted as part of transformation endeavours (Bharadwaj et al. 2013). It is believed that successfully integrating initiatives with Lean practices can result in smoother operations and improved administrative efficiency.

Factors like organisational Culture and Digital Literacy Levels may influence these relationships. These elements can impact the effectiveness of leadership change management practices and the adoption of digital tools. For instance, an organisations resistance to change or low levels of literacy among employees could reduce the impact of otherwise effective leadership or well-planned digital initiatives.

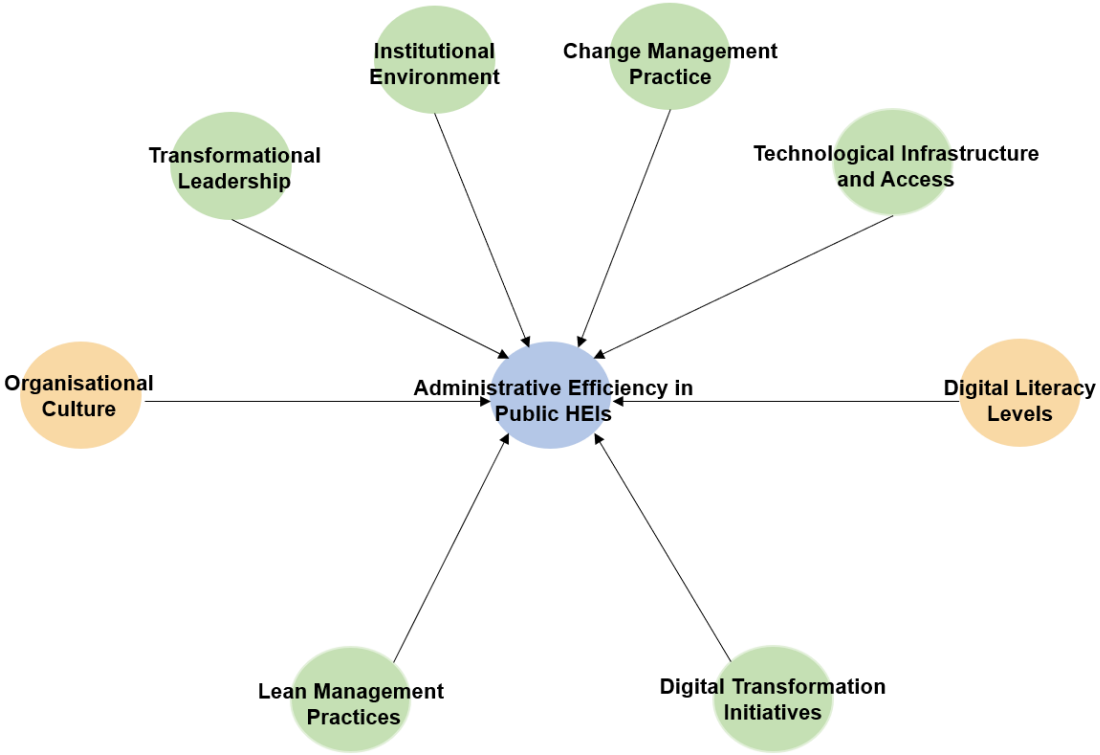
In essence, the theoretical model suggests that transformational leadership, an institutional environment, effective change management practices, strong technological infrastructure, the implementation of lean management practices and the embrace of digital transformation initiatives all play crucial roles in shaping the administrative efficiency of public higher education institutions in South Africa. the framework emphasises the interconnectedness of these factors and highlights how their seamless integration can drive lean digital transformation, ultimately enhancing administrative effectiveness.

This framework establishes a foundation for exploring research questions and propositions to be investigated in the study. It directs the research methodology by outlining themes identified through literature reviews which will inform the interview questions and qualitative research process. Figure 2.2 below is a visual representation of the framework for lean digital transformation in higher education institutions (HEIs) in South Africa.

The Figure below shows how the broader theoretical themes, like transformational leadership, institutional environment, change management practices, technological infrastructure and access, lean management practices

and digital transformation initiatives are interconnected and influence administrative efficiency in HEIs. It also highlights how organisational culture and digital literacy levels factors can impact the effectiveness of these relationships. while the literature review identifies the key themes, this qualitative research, through interviews, will delve deeper to validate these findings and uncover the underlying "how" and "why" behind the observed phenomena.

Figure 2.2 Conceptual Framework for lean digital transformation in public higher education institutions (HEIs)



2.7 Summary of Literature Review

This study adopted a multi-theoretical framework to provide a more comprehensive lens for understanding digital transformation in higher education institutions. While no single theory sufficiently captures the multifaceted nature of technological change, the integration of several perspectives allows for a richer analysis. Transformational Leadership Theory (Bass & Riggio, 2006) helps explain the role of leadership vision and influence in driving change, while Kotter's (1996) Change Management Model offers a process-oriented view of how

institutions can manage transitions. Institutional Theory (Scott, 2004) provides insights into the regulatory, cultural, and normative pressures that shape organisational responses, and Lean Digital Transformation principles (Womack et al., 1990; Bharadwaj et al., 2013) highlight the need for efficiency, adaptability, and sustainability. Together, these theories complement one another by addressing individual, organisational, and environmental dimensions of transformation. The adoption of this multi-theoretical framework is therefore justified as it provides a holistic foundation for analysing the enablers, barriers, and outcomes of digital transformation within the unique context of South African higher education institutions

In summary, this review of literature delves into the state of digital transformation within higher education institutions particularly focusing on the context of South Africa. It emphasises the importance of transformation as a strategy to enhance operational efficiency drive innovation and maintain competitiveness in an ever-evolving digital landscape.

The discussion covers topics such as approaches to digital transformation; challenges hindering progress and opportunities for South African public universities to successfully adopt and execute these strategies. By examining case studies from institutions like Prince Sultan University and King Saud University, valuable insights are provided on digital transformation practices that highlight the significance of leadership, cultural adaptation, and ongoing skill development.

Additionally, the review underscores how both internal and external factors play roles in determining the outcomes of transformation endeavours. Internally, issues such as leadership hurdles, cultural resistance and skills gaps are identified as roadblock. Externally, regulatory constraints, technological infrastructure limitations and financial constraints present obstacles. Overcoming these challenges necessitates an approach that combines leadership practices with effective change management strategies and strategic technology utilisation.

Furthermore, it explores the benefits of Lean Digital Transformation as a framework for enhancing efficiency within South African public higher education

institutions. By combining lean principles with digital technologies, institutions can make enhancements to their operations if they address local obstacles, like reluctance to change and the shortage of digital skills effectively.

2.7.1 *Proposition 1*

Implementing comprehensive digital transformation strategies, including cloud computing, virtual learning technologies, AI, big data analytics, and adherence to quality and accreditation standards, significantly enhances operational and administrative efficiency, educational quality, and student experience in higher education institutions.

2.7.2 *Proposition 2*

The successful digital transformation of higher education institutions is significantly impeded by both internal barriers such as leadership challenges, cultural resistance, and insufficient skills, and external barriers such as regulatory constraints, inadequate technological infrastructure, and financial limitations.

2.7.3 *Proposition 3*

Given the critical role of Lean Digital Transformation in enhancing administrative efficiency and aligning with global best practices, South African public higher education institutions that strategically integrate Lean principles with digital tools while addressing local challenges such as resistance to change and the digital skills gap are likely to achieve significant improvements in operational effectiveness and foster a culture of continuous improvement.

This conclusion lays the groundwork for the empirical investigation that follows, where these hypotheses will be tested through interviews and questionnaires designed to gather insights from stakeholders within the South African higher education sector.

CHAPTER 3. RESEARCH METHODOLOGY

Research is the intellectual activity of searching for new knowledge and insights built around a certain topic. The purpose of research is to understand or solve problems that exist by discovering answers to questions through scientific methods (Pandey & Pandey, 2015). According to Corbin and Strauss (2008), methodology refers to “a way of thinking about and studying social phenomena”. Therefore, research methodology is the technique used to conduct a study determining what methods are used to collect, analyse and interpret information relevant to a specific topic.

This chapter will discuss the chosen methodology and why it was suitable for this study. It will further outline the research paradigm, sample, instrument, data collection procedure, data analysis strategies, possible limitations, quality assurance measures, ethical considerations, and the proposed schedule and timelines.

3.1 Research Paradigm

In this section, the chosen research paradigm, ontology, epistemology, and axiology will be discussed to justify the methodological choices and align it with the objectives of this study. The interpretivism paradigm will be used to conduct this study which is suitable for qualitative research aimed at comprehending complex concepts. (Merriam & Tisdell, 2015). The foundation of this concept lies in the idea that our perception of reality is shaped by influences and can be grasped by looking at how people experience it.

The concept of ontology refers to the essence of reality and our ability to comprehend it. Within the realm of interpretivism the stance leans towards relativism suggesting that reality is diverse and subjective shaped by experiences and societal settings (Creswell, 2013). In this research, the primary focus lies in grasping the perspectives of administrators in higher education institutions (HEIs) as they navigate through digital transformation endeavours. By recognising the realities these professionals encounter the study aimed to unveil the situation-

specific elements that influence their adoption of digital tools and innovative administrative practices.

Epistemology delves into understanding knowledge and its acquisition methods. Within the interpretivist framework, the view on epistemology leans towards constructivism. This viewpoint suggests that knowledge is shaped through interactions within society and shared experiences (Lincoln & Guba, 1985). In this study, knowledge was uncovered by examining administrators' viewpoints through interviews and document reviews. By adopting this approach, the researcher collaborates with participants to develop knowledge highlighting the significance of their experiences and perspectives in comprehending the effects of transformation, in higher education institutions.

Axiology focuses on how values play a role in the research process. In research, the axiology takes an approach recognising that the researcher's values and biases can shape the research outcomes. This research emphasises the significance of self-reflection, where the researcher consistently considers their beliefs, values, and potential biases throughout the study. This practice promotes transparency and reduces biased influence on the results. Ethical aspects, like obtaining consent and ensuring confidentiality was crucial within this framework to ensure that research is conducted ethically and with respect for those involved.

The interpretive approach is in line with the research goal of investigating how digital transformation strategies affect procedures in higher education institutions. This perspective favours approaches offering in-depth and comprehensive data for grasping the subtle experiences of administrators (Braun & Clarke 2006). Through embracing interpretivism the study ensured a thorough research framework that boosted the credibility and significance of its results (Creswell, 2013).

3.2 Research Approach

The study employed a qualitative research approach to explore the impact of digital transformation strategies on administrative processes and the culture of innovation and agility within public higher education institutions (HEIs). The

qualitative approach is chosen for its ability to delve into context-specific phenomena by exploring individuals' viewpoints and experiences within their everyday environments (Busetto et al., 2020)

The decision to use this approach stems from various factors. Firstly, the exploratory nature of the research is to grasp the experiences of administrators as they navigate through transformation initiatives. Qualitative methods are deemed suitable, for delving into multifaceted phenomena (Merriam & Tisdell 2015). Secondly, this approach enables the gathering of comprehensive data that can shed light on the administrator's perspectives, attitudes, and actions. Techniques like semi-structured interviews facilitate the acquisition of thorough insights crucial for comprehending the complexities of digital transformation in higher education institutions (Patton, 2015). Lastly, qualitative research underscores the significance of context by allowing researchers to account for the organisational variables that impact the execution and outcomes of digital transformation strategies. This contextual comprehension is vital, for cultivating an understanding of the phenomenon within the backdrop of South African public higher education institutions (Lincoln & Guba, 1985).

The qualitative approach is appropriate for this study because it aligns with the research questions and objectives, which focus on exploring the depth and complexity of digital transformation in administrative processes. This method enabled an examination of the factors impacting integration and the perspectives of administrators offering valuable insights that quantitative techniques may miss. In summary, the qualitative research approach is justified by its ability to explore complex phenomena, gather rich and detailed data, and consider the contextual factors influencing digital transformation.

3.3 Research Design

This research used a case study research design to investigate how digital transformation strategies affect processes at a higher education institution (HEI) in South Africa. The study design is ideal for this study as it allowed the researcher to concentrate on the environment of a South African public HEI,

exploring the challenges and opportunities associated with digital transformation (Yin, 2020). Focusing on one institution enables an in-depth exploration of administrators' experiences and perspectives revealing the intricacies and subtleties of digital adoption and how it relates to administrative efficiencies. This nuanced understanding is crucial for developing a comprehensive training tool to improve efficiency through digital transformation

A key benefit of utilising a case study design is its capacity to present a perspective on the research issue. This method allows for gathering data sources such, as interviews, documents, and observations that can be cross-referenced to strengthen the credibility and dependability of the results. Furthermore, case studies are particularly useful for exploring under-researched areas, making them ideal for investigating the relatively original application of digital transformation strategies in the public HEI sector (Busetto et al., 2020)

Nonetheless, employing a case study design does come with its drawbacks. One drawback is the limitation on generalisability due to focusing on an institution. Although the insights gained may offer an understanding of the context they may not easily translate to other institutions or contexts. Moreover, conducting case studies can be time-intensive and resource-demanding in terms of data collection and analysis. Despite its constraints, the case study methodology provides a foundation for generating contextually rich findings that can guide digital transformation strategies in similar environments.

3.4 Data Collection Methods

This section details how information will be gathered to address the questions of this research study. Qualitative data will be collected through semi-structured interviews. Semi-structured interviews will be carried out with administrative staff and management, at the chosen university. This approach was selected for its flexibility in exploring the perspectives and experiences of participants while ensuring that important topics related to transformation are addressed (Adhabi & Anozie, 2017). The open-ended nature of this method enabled researchers to probe deeper into specific issues as they arise facilitating the collection of detailed

and insightful data crucial for comprehending the intricacies of digital adoption in the university setting (McGrath et al., 2018).

3.5 Population and Sample

3.5.1 *Population*

The research participants include administrative personnel and management at a public university in South Africa. This institution is appropriate for the study due to its ongoing efforts in digital transformation and its representative nature of the broader HEI sector in the country. By focusing on this specific institution, the study can gain detailed insights into the challenges and successes of digital transformation and its impact on administration in a real-world setting, providing valuable context-specific information.

3.5.2 *Sample and Sampling Method*

This section describes the population and sample for the study, including the selection criteria and sampling method used to ensure the data collected is relevant and sufficient for answering the research questions.

The researcher selected participants using sampling, a method, for qualitative research aimed at obtaining in-depth insights from individuals with specific expertise or experience related to the research topic (Palinkas et al., 2015). A purposive group of 11 administrators was invited to participate. Their diverse roles provided varied perspectives, allowing for thematic depth and reaching the point where no new insights emerged. Data saturation was reached after the tenth interview, as no new themes or insights emerged from subsequent participants. This indicated that the sample size was sufficient to capture the depth and breadth of perspectives required for the study (Hennink, Kaiser, & Marconi, 2017).

Participants were selected based on their involvement in digital transformation initiatives and their roles within the institution's functions. This approach ensures that the sample represents the stakeholders in the transformation process. The

demographic characteristics of the participants will consider factors such as years of experience, department, and level of participation in initiatives to capture a range of perspectives.

Invitations for participation in the study was extended through communication channels within the institution such as email invitations and internal notifications. The researcher explained the purpose of the study, and the data collection process, and ensure confidentiality and voluntary participation to encourage candid and comprehensive response.

3.6 The Research Instrument

The primary research instrument for this study is a semi-structured interview guide, designed to gather in-depth qualitative data from administrative staff and management within the selected public higher education institution (HEI). The interview guide is developed based on the research questions, literature review, and theoretical framework to ensure alignment with the study's objectives.

- **Introduction and background:** In this section, the aim is to collect information, about the participant's demographics and understand their roles and experiences within the institution. This will help provide context for their responses.
- **Current practices of digital transformation:** This part delves into the strategies and tools currently used in processes shedding light on their level of digital literacy and the extent of digital adoption.
- **Challenges and obstacles:** The questions here aim to pinpoint the barriers hindering the digital adoption transformation, which could stem from technological limitations organisational issues, or human factors.
- **Impact on efficiency and innovation**: This section explores how digital transformation efforts have impacted efficiency and fostered a culture of innovation within the institution.
- **Future needs and recommendations:** This part seeks participants' views on what I necessary to enhance digital adoption and innovation including any training or support requirements.

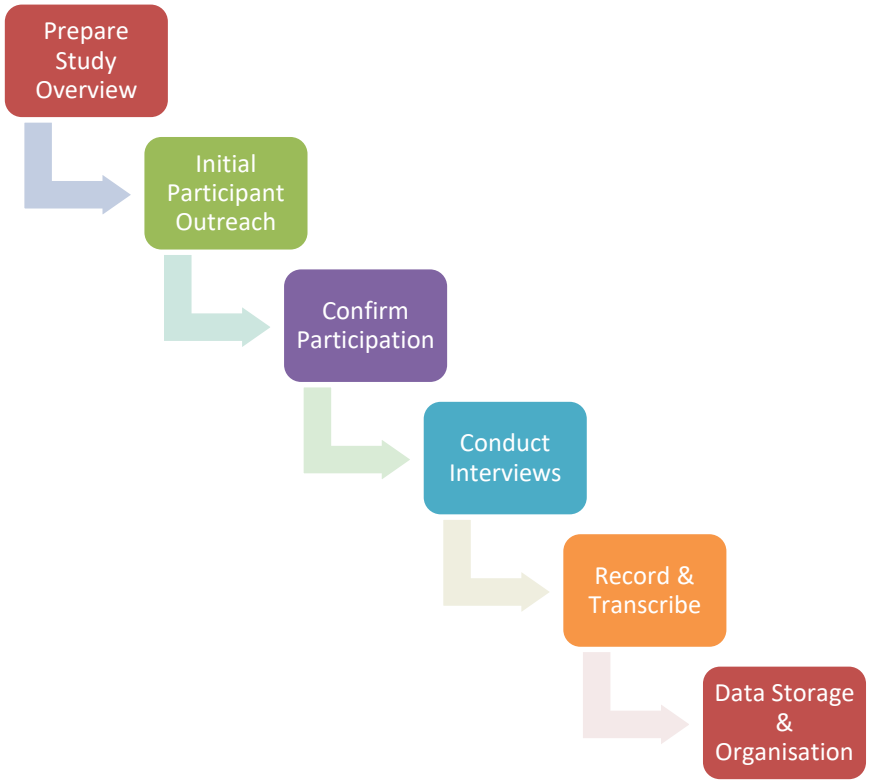
The interview guide is included in Appendix A, along with a covering letter explaining the research purpose, participants' rights, and data usage.

3.7 Procedure for Data Collection

Information was gathered by conducting structured interviews either in person or, through video calls depending on what works best for the participants. Participants were approached through formal communication channels within the institution, including email invitations and internal announcements. The emails provided an overview of the study and an invitation to participate. Subsequent communications were used to confirm interview times and locations.

During the interviews, consent was requested to record and transcribe session to ensure accurate data collection. Transcriptions were created for analysis purposes. All data was stored on an encrypted laptop and organised in preparation for analysis. This approach was chosen as it allowed for rich data collection while being considerate of the participants schedules and preferences. Figure 3.1 demonstrates the procedure followed when collecting the data.

Figure 3.1 Data Collection Procedure



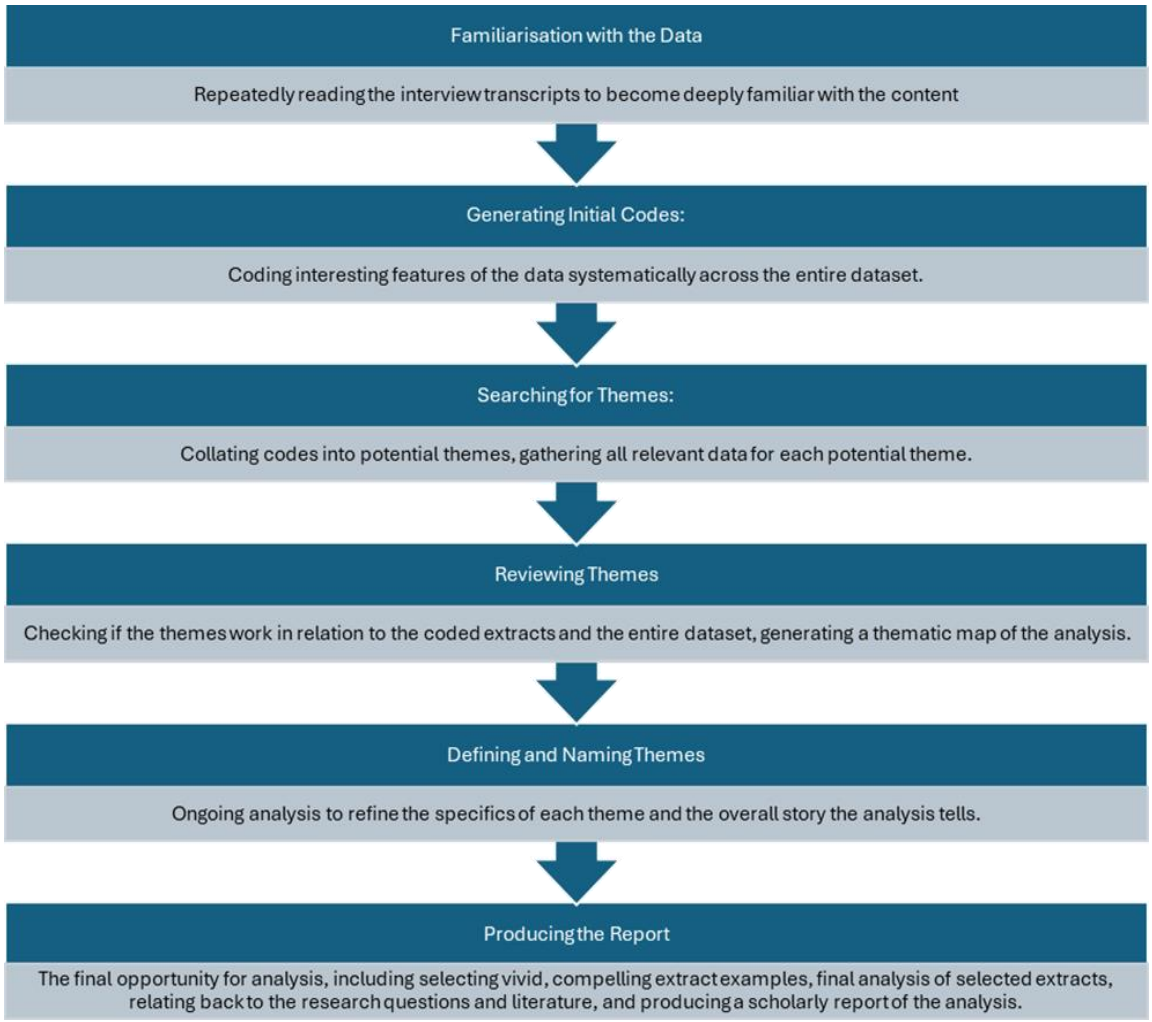
3.8 Data Analysis Strategies and Interpretation

This study adopted an exploratory single-case study design, focusing on a South African higher education institution to provide an in-depth understanding of digital transformation processes. A thematic analysis was conducted using Braun and Clarke's (2006) six-step framework, with an inductive coding process guiding theme development. The analysis began with repeated readings of the interview transcripts to ensure familiarity with the data, followed by line-by-line coding to capture meaningful units of information. These initial codes were then clustered into broader categories, which were refined into overarching themes that reflected recurring patterns across participants' narratives. Each theme was subsequently defined and reviewed in relation to the research questions and theoretical framework, ensuring both coherence and interpretive depth.

To strengthen methodological rigour, findings were triangulated through peer debriefing with colleagues familiar with qualitative methods, as well as comparison with the existing body of literature. This combination of strategies enhanced the credibility, dependability, and validity of the study's findings, providing a transparent account of how the analysis was conducted and how conclusions were reached.

Figure 3.2 below demonstrates the steps followed in the thematic analysis used to conduct and analyse the findings of this study.

Figure 3.2 Steps for a Thematic Analysis



3.9 Possible Limitations and Challenges of the Study

There are some drawbacks, to this research, including challenges related to methodology, sampling, data collection, resources, and participant availability. From a perspective relying on qualitative data from a single case study could limit the applicability of the findings to different settings or institutions. The use of sampling might introduce bias since participants are chosen based on criteria that may not fully represent the larger population resulting in limitations in sampling.

Regarding data collection differences in interview responses and the potential for interviewer bias could impact the consistency and reliability of the collected data. This presents a hurdle to ensuring the accuracy and uniformity of the information

obtained. Moreover, constraints in resources such as time and effort needed for conducting and transcribing interviews can be substantial making it a resource intensive process.

The availability of participants also presented a challenge as scheduling interviews, with administrative staff and management was difficult. This did influence both the number of participants involved and the depth of data gathered. By recognising these limitations upfront this study aims to offer an assessment of obstacles and how they will be managed to uphold the credibility and dependability of the research outcomes

3.10 Quality Assurance

3.10.1 *Transferability*

The concept of transferability revolves around how applicable the results of this research can be, in other situations or environments. In qualitative research, transferability was arrived at by offering descriptions of the research setting and participants allowing others to evaluate how relevant the findings may be to their own circumstances (Tracy, 2010). To boost transferability in this study we will provide in depth descriptions of the setting, participants, and digital transformation processes within the Higher Education Institution (HEI). This will involve providing context on the institution's structures, specific digital tools and strategies used and the socio-cultural factors influencing these processes. By presenting an overview of the context readers can assess how relevant the study's findings are, to HEIs or similar administrative environments.

3.10.2 *Credibility*

Credibility, in research is like the validity in quantitative research focusing on the accuracy and trustworthiness of the findings. To test the results, the researcher compared the answers from the different participants and identified several themes and outlooks to ensure consistency. Credibility in this study was reached by comparing the interviews with each other for consistency. Also, credibility was

established through the selection of the participants based on their role, their responsibilities, experience and skills within the organisation. Their responses were compared based on the same interview guide as suggested by Baxter and Jack (2008) and the discussion of the current study also supported credibility by comparing their responses to the findings of previous studies.

3.10.3 *Dependability*

Dependability pertains to how consistently and reliably research findings can be replicated. This is demonstrated by outlining the research methodology, including data collection and analysis procedures so that other researchers can duplicate the study (Tracy, 2010). In this research an audit trail will be kept that documents each step of the process starting from creating the interview guide, to coding and analysing the data thematically. This audit trail will contain notes on choices and reflections on our research journey. By ensuring transparency and thorough documentation of the research procedures, researchers will aim to meet the criteria, for dependability enabling researchers to replicate our study or utilise our methodology in research settings.

3.10.4 *Confirmability*

Confirmability, in research is like objectivity in qualitative research and refers to the degree on how the study findings are influenced by participants and the context rather than the researcher's own biases or assumptions (Lincoln & Guba 1986). To ensure confirmability, this research used methods, like self-reflection and audit trails. Self-reflection involves the researcher continuously examining their biases and how they may impact the research process. The audit trail as mentioned before offered a record of the research methods and decisions allowing external reviewers to follow how the findings were derived. Additionally, peer debriefing was utilised to assess and question the findings and interpretations to ensure they accurately represented the collected data.

By adhering to these criteria of transferability, credibility, dependability, and confirmability, this study aims to ensure the rigor and trustworthiness of its

qualitative findings. These strategies facilitated the study's overall quality, providing valuable insights into the impact of digital transformation strategies within the public higher education institution (HEI) sector.

3.11 Ethical Considerations

Maintaining ethical standards was central to this study, with steps taken to safeguard the rights, dignity, and well-being of all participants. Ethical clearance was obtained from the Wits University Postgraduate Committee (PGC) and the WBS Ethics Committee (reference number: WBS/DB2374510/123). Prior to each interview, participants were provided with an information sheet outlining the study's purpose, procedures, potential risks and benefits, and their rights, including the right to withdraw at any stage without penalty. Written informed consent was obtained to ensure participation was voluntary and based on full understanding.

To protect confidentiality and anonymity, participants were assigned numerical identifiers (e.g., Participant 1, Participant 2), and no names, job titles, or personal details were included in the transcripts. Interview data were securely stored: digital files on password-protected devices accessible only to the researcher, and any physical documents in locked cabinets. In line with institutional policy, all data will be retained for five years before secure disposal.

Interviews were conducted in private online meeting platforms to maximise confidentiality and comfort. Questions were designed to minimise potential harm, and participants were reminded of their right to decline answering any questions that made them uncomfortable. By attending to informed consent, anonymity, secure data management, and minimisation of harm, the study upheld the highest standards of ethical practice and ensured respect and protection for all participants.

3.12 Summary of Chapter

In summary, Chapter 3 explained the methodological approach of this qualitative research and placed it within the interpretivist paradigm to deeply understand the

administrative perspective of digital transformation in one of the selected South African higher education institutions. In this regard, the chapter explained that a qualitative approach was chosen to explore the experiences and perceptions of administrators in detail through semi-structured interviews. It explained how the participants were selected to ensure that they were diverse and covered the institution's professional administrative complement. Also, the chapter discussed the methods applied in the analysis and interpretation of the data using rigorous thematic analysis, while at the same time outlining the possible limitations and challenges such as participant bias and data reliability. The credibility, dependability, confirmability, and transferability of the quality assurance measures were articulated to ensure the credibility of the findings. Ethical considerations were explained in detail, with emphasis on transparency, confidentiality and ethical integrity of the research process. This chapter provides a strong methodological base for the study and prepares the ground for the next chapter, which presents the results and findings from the data collection and analysis processes described above.

CHAPTER 4. PRESENTATION OF RESULTS / FINDINGS

4.1 Introduction

This chapter presents the findings of the study on the digital transformation of administrative processes at a selected South African public higher education institution. The aim of the study was to determine the major digital transformation strategies that can improve administrative efficiency, the difficulties that may arise during implementation and how these strategies can be applied to the higher education sector in South Africa.

The main data collection source consisted of conducting semi-structured interviews with 11 administrative staff from various departments to understand their experiences, perceptions, and challenges of digital transformation. The participants were randomly selected based on availability and willingness to participate. The sample represented different hierarchical levels and consisted of staff from the following departments and or divisions: Human Resource Development Unit, Student Enrolment Centre, Central Records Office, ICT Office, Financial Information Management Systems, Academic Information and Systems Unit, Business Intelligence Services, Faculty and School. The participants were suitable for this study as they all fall under the professional administrative staff designation and had the necessary roles and experience to provide valuable insights for the study.

All the interviews were conducted online, recorded and transcribed via Microsoft Teams. A copy of the recording and transcript was made available to both the researcher and participant for audit trail purposes and to ensure the data and information was documented accurately. A thematic analysis was conducted, guided by the research questions and conceptual framework, which was outlined in the previous chapters. The data collected from interviews was transcribed and analysed using Atlas.ti, a software programme that assists with analysing data and detecting themes and sub themes emerging through an iterative coding

process. This approach helped to identify important findings that are relevant to the research objectives.

The following themes were identified as global digital transformative strategies: technological innovations and tools, process optimisation and administrative efficiency, change management and adoption strategies, financial and resource considerations, institutional and strategic alignment, performance monitoring and continuous improvement. The impact of these strategies was identified as enhanced administrative efficiency and process optimisation, data-driven decision-making insights, communication collaboration and stakeholder engagement, innovation and organisational transformation, user experience and service delivery and financial and resource efficiency.

Based on the analysis of responses from participants, the barriers were categorised into the following themes: organisational and leadership barriers, technological and infrastructure barriers, human capital and skills barriers, financial and resource constraints, process and implementation challenges, as well as psychological and emotional barriers. Lastly, the findings highlight critical success factors that facilitate the successful adaption of digital initiatives, which are strategic planning and organisational readiness, workforce readiness and capacity building, technology and systems integration, communication and collaboration for effective adaption, resource allocation and financial planning, and performance monitoring and continuous improvement.

This chapter will be discussing the findings relevant to addressing the following research questions:

- What digital transformation strategies have successfully enhanced administrative efficiency in higher education institutions globally and what was the impact?
- What are the key barriers to the adoption of the implementation of digital transformation from an administrative perspective at a selected public higher education institution?
- How can these digital transformation strategies be adapted at a selected public higher education?

To ensure a comprehensive understanding of the findings, this chapter is structured according to the major themes derived from the analysis. Each section presents key insights, validated through the participant's verbatim responses, to create a rich and contextualised narrative of the digital transformation in administrative operations. The chapter ends with a summary of the findings.

4.2 What digital transformation strategies have successfully enhanced administrative efficiency in higher education institutions globally?

To answer this question the participants perception of successful digital strategies was observed and investigated through a thematic analysis. The following key themes were identified from the analysis: technological innovations and tools, process optimisation and administrative efficiency, change management and adoption strategies, financial and resource considerations, institutional and strategic alignment, performance monitoring and continuous improvement. Figure 4.1 illustrates the themes and sub-themes that represent the digital transformative strategies contributing to administrative efficiency in higher education institutions. These are discussed in more detail in the sections to follow.

Figure 4.1 Digital transformation strategies for administrative efficiency in higher education institutions



4.2.1 *Technological Innovations and Tools*

Participants consistently stressed on the significance of technological innovations and digital tools in enhancing the administrative effectiveness in the higher education institutions. This theme was also visible through the various examples provided by the participants, illustrating the effective integration of technology in enhancing administrative functions and institutional performance.

Participant 1 provided a clear understanding of automation and data analytics, explaining how implementing an automated job scheduling system enhanced operational responsiveness:

"A great example is our automated job scheduling. Our systems run processes from 2:00 AM to 7:30 AM and again in the evening. If a process fails, we are immediately alerted through Telegram—a tool we automated to notify us of connection issues or critical errors. This allows us to address problems proactively, ensuring minimal downtime." Participant 1

The participant further elaborated on the importance of analytics tools, claiming to rely on SAP Business Objects, Oracle Analytics Cloud, and Power BI:

"For reporting, we rely on SAP Business Objects, Oracle Analytics Cloud, and Power BI. Each tool serves specific needs: SAP Business Objects excels at creating detailed, formatted reports; Oracle Analytics Cloud and Power BI are excellent for dashboarding and self- service analytics. We've also incorporated AI and machine learning using Python for predictive modelling and other data science applications. These tools collectively enable us to handle complex data tasks efficiently." Participant 1

Furthermore, the scope of their data infrastructure was evident, as Participant 1 also pointed out

"With over 52 data marts, we ensure that users receive timely and accurate reports essential for their roles." Participant 1

Participant 5 also agreed with these views and pointed out that the use of innovative digital technologies was vital for their work. Participant 5 also provided a practical example of effective change management during the LMS transition:

“Digital transformation is fundamental to my job. Without these technologies, I couldn’t do my work.” Participant 5

“One standout initiative is the implementation of our LMS, which transitioned from Sakai to a cloud-based system called Ulwazi. This change brought reliability, scalability, and cost predictability. During COVID-19, the urgency to adopt a new LMS led to unprecedented collaboration among technical, academic, and administrative teams”. Participant 5

Participants also explained the significance of unified and integrated systems. Participant 8 described their usage of PeopleSoft for student information, BIS for reporting, and Microsoft Teams and OneDrive for team collaboration and document storage while also exploring robotic process automation (RPA):

“We use several tools, including PeopleSoft for student data management, reporting tools like BIS for data analytics, and collaborative platforms like Microsoft Teams and OneDrive. For data requests, we recently digitised the process by introducing an online form that routes submissions to a generic email accessible by the entire team. This has improved efficiency by eliminating delays caused by staff absences. Additionally, we’re exploring robotic process automation (RPA) for tasks like course creation and fee linking. These tools have reduced manual labour, allowing staff to focus on quality assurance instead.” Participants 8

Participant 11 pointed out how products such as self-service portals and integrated systems brought a positive change in the efficiency of operations and user experience:

“The self-service portal is one of the most impactful innovations. It allows applicants to upload required documents directly, eliminating the need for dedicated staff to scan and manage these manually.” Participant 11

“The tools were designed with our existing workflows in mind, ensuring they align with our operational needs.” Participant 11

“Integration has eliminated silos that previously hindered communication and decision-making.” Participant 11

The overall perception based on the participants responses is that technology and tools are crucial in this regard as the institution used artificial intelligence (AI)

and automation, cloud-based platforms, data management systems, and digital collaboration tools to streamline process. The use of AI systems, automated job scheduling, and robotic process automation (RPA) has minimised the need for human intervention and enhanced the integration of workflows. Also, cloud-based technologies such as cloud storage, learning management systems (LMS), and online self-service portals have elevated the accessibility and business efficiency. Some of the data analytics tools used by the institution included Power BI, Oracle Analytics Cloud and SAP Business Objects which has optimised reporting and decision-making processes within the institutions.

4.2.2 *Process Optimisation and Administrative Efficiency Technological*

The responses from participants emphasised the importance to look at and refine administrative processes even as we introduce technological innovations to ensure that they are efficient. How automation, workflow management and predictive analytics had greatly improved the administrative efficiency of higher education institutions was highlighted.

Participant 1 explained the significant impact of automation on the reporting process:

"Over the past 17 years, we've implemented significant automation. For instance, reports that used to be manually compiled now run automatically every Monday morning and flag data issues for faculties to resolve." Participant 1

However, Participant 1 explained that predictive analytics was a key driver of better institutional results, despite the existence of scepticism concerning the utility of such tools:

"Our predictive modelling increased the graduation rate from 35% to 45%. Despite this success, scepticism hinders broader adoption, leading some to question the value of these investments." Participant 1

Participant 2 explained the benefits of digitised document management systems and how they help the institution to work effectively and in cooperation with other structures:

"OnBase has been a game-changer. It allows staff across faculties to access and upload documents to the correct links, making it easier to retrieve information. For example, if a student moves between faculties, staff can quickly access their records without delays. This has significantly improved efficiency and collaboration." Participant 2

Participant 8 also added to the discussion of the effectiveness of the automated communication tools like chatbots:

"One example is the chatbot we introduced to manage frequently asked questions. It integrates with our student system, learning management system, and library, providing automated responses to common queries. This initiative has already reduced the volume of inquiries at the Student Enrolment Centre." Participant 8

Participant 11 provided more detail to these ideas by focusing on the importance of clear statistical reporting and decision making on the data in the improvement of the administrative functions:

"For instance, we now receive detailed statistics that help us track application progress and document management. These insights enable data-driven decisions, enhancing both efficiency and accuracy." Participant 11

Additionally, Participant 11 commented on the fact that the data insights help the institution to act preventatively regarding the identified challenges:

"Data-driven insights from reports have also encouraged a proactive approach to addressing issues."- Participant 11

Furthermore, Participant 11 explained how all the above-mentioned administrative tools are integrated and work together effectively:

"Our primary tools include SIMS, Salesforce, OnBase for document management, and shared folders for collaboration. We also use Google Forms for tracking processes like SAQA waivers. The special token process, introduced for late applications, has further streamlined operations. Integration between these tools ensures data consistency and enhances administrative efficiency." Participant 11

The participants statements reveal that workflow simplification, process automation, and digitalisation of administrative procedures have contributed to faster turnaround times and fewer errors. The use of digital tools has eliminated application and enrolment clutters and hence reduced the need for manual handling of the same. Moreover, real time communication tools and self-service portals have enhanced the interaction between the students and the administrative staff. Furthermore, data-driven decision-making has become a key enabler of strategic planning through predictive modelling, which allows the institutions to identify the gaps and make changes based on the data.

4.2.3 *Change Management and Adoption Strategies*

The role of strategic change management practices was stated as crucial for the success of digital transformation efforts in the interviews, with leadership commitment, training, and proactive stakeholder engagement identified as crucial factors to reduce resistance and enhance institutional readiness.

Participant 2 provided insights into how adaptive leadership and social learning helped sustain the digital transition:

"Administrators have adapted to changes and learned to teach each other how to navigate new systems. Collaboration and the willingness to learn have fostered a culture of innovation." Participant 2

Participant 4 explained how lack of infrastructure and poor decision-making by staff is a key issue that can be addressed through equipment and training:

"Providing staff with the right tools and training could empower them to make more informed decisions." Participant 4

Participant 5 built on this view by stressing the need for specified training and institution wide initiatives to encourage innovation:

"To foster a broader culture of innovation, we need targeted training and an institutional commitment to continuous improvement." Participant 5

In support of the above assertion, Participant 7 explained the importance of leadership in facilitating the effective implementation of transformation as a key factor in the success of any change management process:

"Leadership must also prioritise and support these initiatives to drive meaningful change." Participant 7

Participant 7 also supporting the significance training and awareness but also highlighted how staff need to also understand and acknowledge the advantages.

"Training and awareness campaigns are crucial. Staff need to understand what digital transformation entails and how it benefits them." Participant 7

Participant 8 explained that an effective resistance management strategy involves the involvement of stakeholders at an early stage and the provision of clear information to them

"Engaging stakeholders early and clearly communicating the benefits can help mitigate resistance." Participant 8

The necessity of the comprehensive training programmes and the integration of interdepartmental cooperation was further corroborated by participant 10:

"Comprehensive training programmes and greater collaboration between departments would also help build a more robust digital culture." Participant 10

Participant 11 summed up the general view on collaboration, training, and the importance of well-coordinated change management approaches*:*

"Collaboration is key. Working in isolation is no longer viable, especially in a digitally integrated environment. The importance of training and change management cannot be overstated. Ensuring everyone understands and embraces new tools is essential for successful implementation." Participant 11

The findings from the participants' statements highlight that strong leadership, strategic governance, and institutional support are essential in guaranteeing the effective implementation of digital strategies. Leadership commitment and focus have emerged as critical factors that have helped in the development of an organisational culture that embraces new ideas and is ready for the digital shift. Moreover, training and digital literacy programmes have been recognised as key

enablers to ensure that employees are prepared to work with and embrace new technologies. While resistance to change is still a major issue, it can be overcome through proactive engagement of stakeholders, collaboration clear communication strategies, and capacity building initiatives which has helped in the promotion of the use of digital technologies. Thus, the participants' experiences identified that effective change management is largely dependent on strong leadership, clear communication, continuous training, and broad stakeholder engagement. These strategies have helped in building a culture that is accepting of digital transformation and therefore facilitates the uptake and integration of digital tools and processes within the higher education institutions.

4.2.4 *Financial and Resource Considerations*

Participants recognised that although effective change management strategies are crucial for digital transformation, financial aspects limit the scope and durability of such initiatives. The discussions also highlighted key experiences in terms of budget, resources, and the importance of return on investment when implementing digital tools and systems.

Participant 4 stressed the need to focus on specific areas and to invest in robust systems and training in order to boost the digital transformation process:

"Investing in better systems and providing adequate training will make a huge difference." Participant 4

Building on this, Participant 5 stressed that leaders must understand the financial aspects and the strategic importance of digital projects in order to support and advocate for such projects effectively*:*

"Leaders must understand the costs and benefits of digital transformation and actively support these initiatives." Participant 5

Participant 6 provided a solution-oriented insight, explaining that cloud technologies can lead to better scalability and thus lower costs in the long run:

"Investing in cloud-based solutions could improve scalability and reduce long-term costs." Participant 6

Participant 8 directly pointed out the financial issues of digital transformation, stating that lack of funds usually prevents institutions from using useful third party tools and technologies:

"Budget is a significant factor. Many initiatives require third-party tools, but licensing and maintenance costs are often prohibitive. Additional funding would allow us to explore and implement innovative solutions." Participant 8

Emphasising the importance of resources, Participant 10 asserted the value of having separate teams dedicated to the successful management of digital transformation initiatives

"Providing dedicated resources and fostering a collaborative culture are key." Participant 10

"Increased resource capacity is critical. Dedicated project teams could focus solely on transformation initiatives without being bogged down by day-to-day operations." Participant 10

The responses therefore suggest that those institutions that have successfully integrated digital tools have done so by identifying specific financial resources, making strategic investments in technological infrastructure, and conducting a cost-benefit analysis to determine the long-term sustainability. This remains a critical issue as far as funding for digital transformation is concerned since some institutions are unable to fully integrate the latest technological solutions due to financial constraints. However, those institutions that have secured more funding for digital projects have observed improvement in efficiency, cost reduction, and improved service delivery. Conversely, institutions with financial constraints are likely to face difficulties in fully integrating the new digital solutions, which goes to show that funding and resources is a key determinant of the extent and effectiveness of digital transformation efforts.

4.2.5 *Institutional and Strategic Alignment*

Another theme that was identified from the interviews is the role of institutional and strategic alignment in the digital transformation process. The participants

argued that the alignment of digital efforts to organisational strategic objectives greatly improves their effectiveness and sustainability.

Participant 5 highlighted the significance of sound data management and user-friendly reporting tools:

"This highlights the need for robust data governance and accessible reporting tools." Participant 5

A step-by-step and progressive implementation of digital transformation was suggested by participant 7

"We need to adopt a more strategic approach. Digital transformation should start small, with pilot projects in specific departments, before scaling up. Continuous improvement is key—this involves revisiting and refining processes regularly." Participant 7

Building on the concept of strategic alignment, Participant 7 explained how the use of data can be used to ensure that the digital strategy is in line with the current and future trends in the education sector:

"I now rely heavily on data to track trends—what people are studying, what they need to study, and how our offerings align with global and local developments in higher education. We aim to stay competitive, not just within South Africa, but globally, especially in terms of research outputs. This means understanding how other institutions are adopting digital tools for collaboration, efficiency, and innovation." Participant 7

According to Participant 8, clearly communicating strategic plans by management is vital and the benefits of integrating both top-down and bottom-up strategies in management decision-making processes in institutions. Participant 8 also noted that leadership should focus on translating strategic goals to all levels of the institutions. When employees know the general goals of the company, they will likely participate in the initiatives.

"Leadership should prioritise cascading strategic objectives to all levels of the organisation. When staff understand the broader goals, they're more likely to engage with initiatives. Additionally, adopting a mix of top-down and bottom-up approaches can capture valuable insights from those directly impacted by changes." Participant 8

Participant 9 provided a practical perspective by pointing out the need to compare with other institutions to determine where there is room for improvement. Consequently, demonstrating the significance of benchmarking.

"For example, they've compared our systems with those of other universities to identify areas for enhancement." Participant 9

In alignment with of previous participant's views, Participant 10 underscored the need for leadership-driven strategic alignment and added that digital transformation should be considered as a strategic imperative:

"Leadership should prioritise digital transformation as a strategic objective, ensuring alignment across all levels of the organisation." Participant 10

Participant 10 also shared the specific alignment of the financial applications with the institutional strategies and stressed the forward-thinking approach to technological integration:

"My role involves ensuring that the university's financial applications run efficiently and align with finance business policies and procedures." Participant 10

"Finally, aligning organisational strategies with technological capabilities would ensure that decisions are forward-thinking and support long-term goals." Participant 10

In general, the participants feedback shows that the success of the digital initiatives is dependent on the extent to which they are integrated into the institution's policies and the wider organisational objectives. Based on the case study presented in chapter 2 and evidence from participants' insights, it supports the idea that institutions that have come up with clear policies, standardised and aligned digital processes and tailored solutions to the needs of their institutions have reported higher levels of success in their transformation processes. Comparing the performance of other universities and implementing the best practices from both local and international institutions has also helped to achieve strategic digital alignment.

4.2.6 *Performance Monitoring and Continuous Improvement*

Besides implementation of strategies, participants have indicated that performance monitoring is crucial to ensure that digital transformation efforts are on the right track to meet the desired outcomes. It is crucial for institutions to put in place systems for tracking progress, finding bottlenecks and making continuous improvements to digital processes. Monitoring and controlling the performance and making changes for the sake of improvement have been conveyed as important factors in the preservation of the digital transformation efforts. Participants reported the following:

Participant 6 explained how success in one area of the institution can lead to the adoption of similar practices across the rest of the institution:

"For example, our work with the Faculty of Engineering inspired the Faculty of Humanities to adopt similar processes. This demonstrates how innovation can spread when initial projects succeed." Participant 6

A step-by-step gradual approach, starting with the pilot projects and successive improvement of the processes should be followed argued Participant 7:

"Digital transformation should start small, with pilot projects in specific departments, before scaling up. Continuous improvement is key—this involves revisiting and refining processes regularly." – Participant 7

Participant 8 went further to describe specific tasks related to quality control, which are knowledge management, training, and systematic testing:

"My initial responsibilities included knowledge management, training, and testing system upgrades to ensure quality before deployment." Participant 8

"For example, stakeholders now approach us with ideas for system improvements that reduce manual work. This change in mindset indicates a growing culture of innovation and adaptability, which is crucial for sustaining digital transformation." Participant 8

Participant 9 discussed the positive experiences of proactive monitoring and the involvement of various stakeholders in order to ensure that the system is reliable and efficient.

“I monitor system performance, troubleshoot glitches, and liaise with the ICT department to address any issues.” Participant 9

“Administrators are proactive in identifying gaps and suggesting improvements.” Participant 9

Participant 9 also stressed the importance of the ongoing evaluation, especially from the students and staff, to enhance and develop the digital processes.

“Additionally, fostering an environment of continuous feedback from students and staff will help us refine our systems and processes.” Participant 9

“One of my key responsibilities is following up on pending tickets, testing feedback from ICT, and ensuring resolutions are implemented effectively. I act as a bridge between the AISU department, ICT, and other stakeholders. In addition, we conducted a survey to understand students’ experiences with the online application system. The feedback we gathered was aimed at enhancing the system’s functionality to improve user satisfaction. This initiative underscores our commitment to leveraging technology to create a seamless application process for students.” Participant 9

“Promoting customer-centric feedback mechanisms would be a game-changer. For example, allowing students to provide detailed feedback on specific steps in the application process would help us identify pain points and address them more effectively.” Participant 9

Participant 10 discussed the constant process of digitisation and automation and emphasised the significance of the acceleration and adaptation to the changing technologies:

“We initiated a journey to digitise and automate processes, which is still ongoing. While we’ve made considerable progress, the work continues as new enhancements and technologies emerge. We’ve developed a digitisation roadmap for finance and regularly collaborate with business users to identify paper-based processes for digitisation.” Participant 10

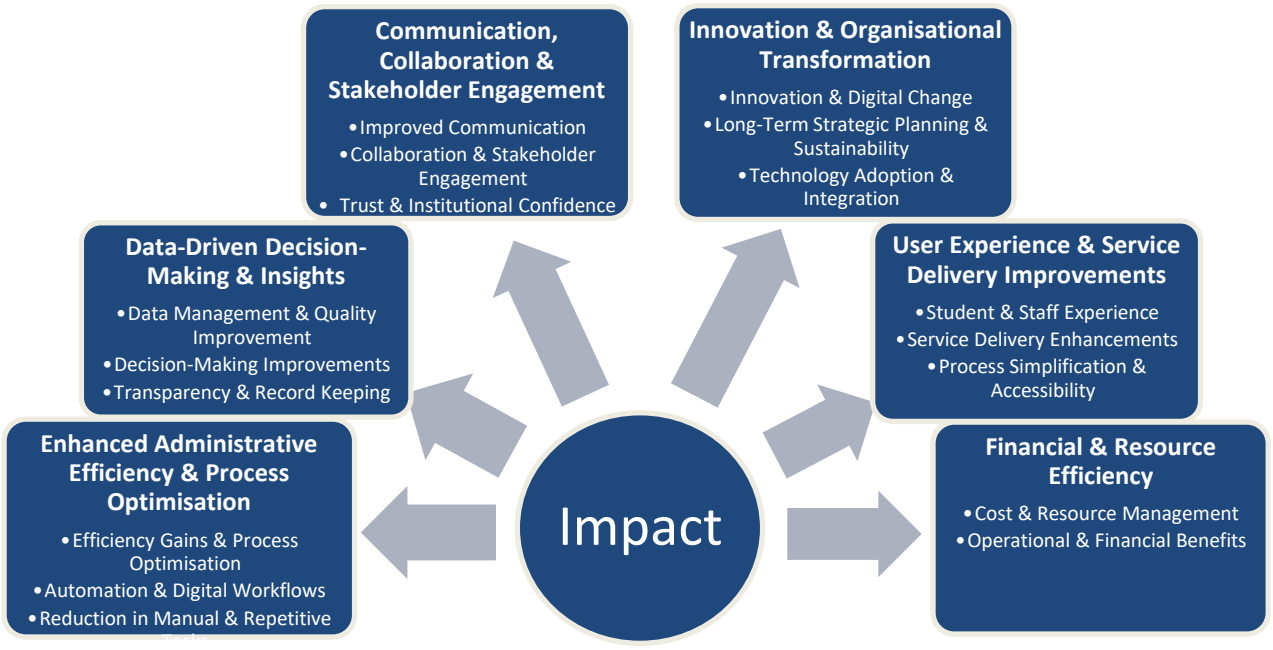
In summary, the findings from the participants’ insights show that institutions that have put in place monitoring tools and feedback mechanisms have been able to measure progress, identify system weaknesses and improve digital processes on a constant basis. The use of pilot projects and phased implementation has

assisted the institutions to test the digital solutions before full scale implementation thus being able to identify any necessary improvements that can be made to enhance efficiency. Therefore, continuous learning, innovation, and iterative improvements have further supported institutions in adapting to evolving technological landscapes.

4.3 What was the impact of these digital transformative strategies?

In terms of the impact, the findings reveal that digital transformation strategies have greatly improved the administrative performance in the higher education institutions. The following themes emerged: enhanced administrative efficient and process optimisation, data-driven decision-making insights, communication collaboration and stakeholder engagement, innovation and organisational transformation, user experience and service delivery and financial and resource efficiency. The below figure demonstrates the themes and sub-themes that have been identified from the interview regarding the impact of digital transformation strategies.

Figure 4.2 The impact of digital transformation strategies



4.3.1 *Enhanced Administrative Efficiency and Process Optimisation*

Having established the key digital transformation strategies, it is crucial to analyse their effect on administrative efficiency. Several positive outcomes were identified by participants including, improved workflow automation, faster processing times and reduced manual errors.

One of the most important factors that were identified in the implementation of workflow automation to enhance efficiency was the use of workflow automation. Participant 1 provided support for this by providing specific examples of how automation drastically reduced the time to perform routine tasks:

"Automation has also reduced repetitive tasks. For instance, departments previously spent an entire month reconciling discrepancies manually. We developed a report that completes this task in five minutes, enabling staff to focus on analysing discrepancies instead of compiling data." Participant 1

"Automated reports now notify requesters and buyers of outstanding orders, cutting delays from months to days. These changes have not only improved administrative efficiency but also positively impacted researchers and lecturers by ensuring timely delivery of resources." Participant 1

Participants also stated that digitised document management systems also helped in enhancing the administrative processes. Participant 2 explained this by describing their experience with electronic systems as follows*:*

"For example, we used to manually retrieve archived documents by physically going to CRO (Central Records Office). Now, with systems like OnBase, we can access these documents electronically, which has made processes much faster and more efficient." Participant 2

Participant 3 continued to discuss the advantages of automation, pointing out how the automated screening processes facilitated the handling of applications.

"Similarly, the introduction of screening processes for bachelor's degree applications ensures we only review applications from eligible students, which has significantly reduced our workload." Participant 3

According to Participant 5 another impact of digitisation was improved acceptance of new technologies by staff.

"The digitisation of administrative processes has made my job easier. For instance, I spend less time influencing people to adopt new technologies because they increasingly recognise the value." Participant 5

Furthermore, the role of automation in enhancing student experiences and reducing administrative burdens was emphasised by Participant 10:

"For example, in the student space, automation has improved service delivery and reduced queues. Students can now complete tasks online, such as applying for financial aid or requesting fee estimates, without needing in-person assistance." Participant 10

Lastly, Participant 11 shared some insights of how digital tools unblocked inefficiencies in the traditional application process/

"The introduction of tokens for special cohorts and online application tools has eliminated many inefficiencies I encountered in my previous roles. For instance, applicants can now apply online, make payments electronically, and upload supporting documents, reducing delays and manual errors." Participant 11

Overall, the analysis of participants' insights reveals that the simplification of processes leads to increased staff productivity and gives staff the opportunity to focus on more strategic issues, solve complex problems and spend less time on mundane tasks. The electronic processing of applications has increased the speed of handling them, improved the students experience and has eliminated some of the administrative congestion. It has also been established that there has been a reduction in delays and bureaucratic inefficiencies because of the use of digital solutions.

4.3.2 *Data-Driven Decision-Making and Insights*

In addition to process efficiency, digital transformation has enabled data-driven decision-making. Advanced analytics and reporting tools enable institutions to make more informed decisions from real-time data. Based on some of the

participants inputs below, decision making based on data has enhanced transparency, accountability and the confidence of the institution.

Participant 1 explained how various analytics tools including SAP Business Objects, Power BI, and Oracle Analytics Cloud have enhanced reporting as follows:

“SAP Business Objects provides the flexibility to format reports in ways required by stakeholders like the Department of Higher Education. Power BI and Oracle Analytics Cloud allow users to easily slice and dice data, enabling self-service reporting.” Participant 1

"By empowering other departments to create their reports, we’ve offloaded routine tasks and shifted our focus to innovation and automation." Participant 1

Expanding on this, Participant 9 explained the actual changes in effectiveness of operations and management of resources as a result of data-driven approaches:

“For instance, we use BO reports to ascertain the impact of issues. These reports allow us to prioritise problems and allocate resources effectively. The transition from manual to data-driven processes has been a game-changer, making our operations more streamlined and efficient.” Participant 9

Similar opinions were also expressed by Participant 11, who pointed out that the reporting tools have been improved to support better decision-making and how data integration has improved communication and overall performance:

“Decision-making processes have also improved with enhanced reporting capabilities. For example, schools can now record decisions within the system, and consultants receive detailed reports, making it easier to finalise decisions.” Participant 11

“Integration has eliminated silos that previously hindered communication and decision-making. For instance, we now receive detailed statistics that help us track application progress and document management. These insights enable data-driven decisions, enhancing both efficiency and accuracy.” Participant 11

Therefore, based on the results of the study, it is possible to state that digital transformation plays a significant role in enhancing institutional decision-making

through the provision of timely and accurate data, optimal utilisation of resources, and monitoring of performance indicators.

4.3.3 *Communication Collaboration and Stakeholder Engagement*

The participants also pointed out that the effects of digital transformation are not only limited to the internal operations but also include better collaboration and communication as the results. Different digital tools have increased the participation of students, staff, and institutional stakeholders, thus enhancing the operational effectiveness and service delivery.

Some digital instruments, such as OnBase and Salesforce, have enhanced communication and made document management easier. Participant 3 explained how these tools have not only enhanced the internal business processes but also decreased the administrative enquiries through the self-service options:

"On the positive side, tools like OnBase and Salesforce have bridged communication gaps and simplified document management. For example, students can now access FAQs on Kudubot, which reduces the volume of inquiries we receive." Participant 3

In line with this, Participant 5 discussed how the COVID-19 pandemic has accelerated the collaboration between the institutional departments. The speedy implementation of a new Learning Management System (LMS) clearly showed that effective communication and the involvement of all the interested parties could lead to the accomplishment of a common goal:

"During COVID-19, the urgency to adopt a new LMS led to unprecedented collaboration among technical, academic, and administrative teams. The project's success stemmed from clear communication, stakeholder engagement, and shared commitment to a tight timeline." Participant 5

Participant 9 also focused on the use of digital tools in enhancing student engagement and discussed the importance of chatbot technologies in enhancing student support services:

"Another critical tool is the chatbot, which addresses student queries about applications, finances, and residence allocations, reducing the load on call centres." Participant 9

In the context of internal partnership, Participant 11 explained how communication tools such as Microsoft Teams have enhanced the real-time decision-making process and increased the work efficiency of administrative teams. These tools, together with the data analysis, have resulted in more strategic ways of dealing with challenges within the institution:

"Collaboration has improved significantly. For instance, we now have stronger communication between consultants and school administrators. Tools like Teams facilitate quick problem-solving and decision-making. Data-driven insights from reports have also encouraged a proactive approach to addressing issues." Participant 11

Thus, it can be seen that the real-time communication tools, Customer Relationship Management (CRM) systems, and online engagement tools have significantly enhanced the collaboration and service delivery. Thus, the digital transformation has led to the increase of the interaction between the institutional actors and the decrease of the response time, which results in the development of a more responsive, effective and student-oriented environment.

4.3.4 *Innovation and Organisational Transformation*

In addition to operational improvements, digital transformation has also influenced organisational culture and innovative environment. Those institutions that have taken the challenge of embracing new technologies have noticed increased flexibility, future proofing advantages, and competitive advantage.

Another clear indication of cultural shift is the willingness of the staff to change and help other staff to learn new systems. Participant 2 explained how peer learning and collaboration have been the main drivers of innovation:

"Administrators have adapted to changes and learned to teach each other how to navigate new systems. Collaboration and the willingness to learn have fostered a culture of innovation." Participant 2

This collaborative approach has enabled innovation to grow across the different departments. Participant 6 explained that the success of implementation in one faculty made the other faculties to follow the same path:

“Definitely. For example, our work with the Faculty of Engineering inspired the Faculty of Humanities to adopt similar processes. This demonstrates how innovation can spread when initial projects succeed.” Participant 6

Participant 8 commented that there was a change in the attitude of staff, more people are now coming up with their ideas and contributing to the digital innovation process.

“There’s been a noticeable shift. Staff are more willing to embrace digital tools and propose innovative solutions. For example, stakeholders now approach us with ideas for system improvements that reduce manual work. This change in mindset indicates a growing culture of innovation and adaptability, which is crucial for sustaining digital transformation.” Participant 8

Participant 9 continued the same trend by explaining that the administrators in the institution are actively comparing the institution's systems with those of other universities in a bid to recommend for improvement:

“Administrators are proactive in identifying gaps and suggesting improvements. For example, they’ve compared our systems with those of other universities to identify areas for enhancement. This culture of openness and collaboration drives innovation and ensures that we stay competitive.” Participant 9

Taken together, the analysis of participant feedback suggests that the development of the continuous learning initiatives has enabled institutions to be flexible and meet the changes in the technology landscape. It is clear that for institutions to effectively implement digital transformation and align their digital strategies with their long-term goals for innovation and growth, the cultural shifts identified will be crucial. These cultural shifts will continue to be important as universities strive to align their digital strategies with their long-term goals for innovation and growth.

4.3.5 *User Experience and Service Delivery Improvements*

The participants agreed that the digital transformation has brought many positives in the form of improved user experience and service delivery for students and administrative staff. The use of digital tools and platforms has also

enhanced the ease of access to services and increased the levels of transparency in the use of the services.

Accessibility has been seen to improve as well. Participant 6 explained how the use of online systems has helped students to get services easily:

“Students can now apply and access services online, significantly improving their experience.” Participant 6

“Now, with systems like OnBase, we can access records remotely, enabling us to continue operations efficiently even during disruptions. For example, we’ve converted microfiche records to digital formats, improving service delivery and reducing reliance on physical storage.” Participant 6

In line with this, Participant 9 explained how system integration is a key driver of a consistent and integrated user experience:

“Similarly, the integration of SIMS with the chatbot and other systems allows for a seamless exchange of data, enhancing the overall user experience.” Participant 9

Participant 10 stressed the significance of digital transformation in improving student support services, with specific examples from the financial aid department. They explained:

“On the financial aid side, we’ve introduced online hardship applications and external sponsorship letter processes, which have significantly reduced manual effort and improved student experiences.” Participant 10

Participant 10 continued by explaining how automation has enhanced the student-related processes and also discussed the importance of having reliable support and system maintenance:

“For example, in the student space, automation has improved service delivery and reduced queues. Students can now complete tasks online, such as applying for financial aid or requesting fee estimates, without needing in-person assistance. However, this shift means our team must ensure systems function smoothly and address user challenges promptly.” Participant 10

Overall, insights gathered from participants demonstrate that the digital solutions have provided students and staff with easier, quicker and more efficient ways of

getting things done. The self-service portals, the streamlined application processes, and the remote access to services have increased the level of user satisfaction. The digital platforms have also brought in transparency as students can easily follow up on their applications, financial activities and academic information. Institutions have also noted an improvement in the staff satisfaction because of the reduction of the administrative tasks and the pressure on the workload.

4.3.6 *Financial and Resource Efficiency*

Lastly, the participants also pointed out that one of the major results of the digital transformation process is the enhancement of the financial and resource aspects. The use of digital tools and systems has reduced the need for manual labour, optimised processes and allowed for better utilisation of resources to enhance the sustainability of the institutions.

This change from labour-intensive processes to automated systems has enabled more strategic innovation. Participant 1 described how this transition allowed for the purpose of this free up capacity to pursue more broad initiatives:

"Tasks once labour-intensive are now streamlined, freeing us to explore new opportunities, like building the National Student Data Warehouse (NSDW) to benefit not just our university but the broader South African education sector." Participant 1

This was also the case with Participant 4 who gave an example of how automation has enhanced productivity and precision while at the same time decreasing the burden of work:

"Previously, supervisors sent citations manually, and we had to input them into the system ourselves. Now, citations are directly integrated into the system, reducing errors and saving time." Participant 4

Participant 5 also highlighted the financial sustainability of digital platforms when explaining the change in the learning management system (LMS) to a cloud computing system:

“One standout initiative is the implementation of our LMS, which transitioned from Sakai to a cloud-based system called Ulwazi. This change brought reliability, scalability, and cost predictability.” Participant 5

In this light, Participant 6 explained the scalability and cost effectiveness of cloud technologies as an investment:

“Additionally, investing in cloud-based solutions could improve scalability and reduce long-term costs.” Participant 6

Participant 8 connected digital transformation to both improved student services and resource efficiency. Their example of online student registration shows how digitisation supports strategic refocusing:

“Students can now register from anywhere, which has enhanced their experience and reduced costs associated with printing and manual processing. As of last year, 80% of our students registered online, leaving only 20% for manual processing. This shift has improved efficiency and allowed us to focus on more strategic initiatives.” Participant 8

Complementing this, Participant 9 emphasised the importance of data-informed decision-making in effective resource allocation:

“These reports allow us to prioritise problems and allocate resources effectively. The transition from manual to data-driven processes has been a game-changer, making our operations more streamlined and efficient.” Participant 9

Participant 10 followed this up by giving an example of how automation has made it easier for both students and staff to perform their day-to-day activities:

“In many cases, these tools have been highly effective. For example, the online fee estimator allows students to receive their fee estimates automatically, saving time for both students and staff.” Participant 10

“Providing dedicated resources and fostering a collaborative culture are key. Additionally, focusing on quick wins can build momentum and demonstrate the tangible benefits of digital transformation to stakeholders.” Participant 10

Thus, the outcomes of the study show that digital transformation has led to the reduction of operational costs by eliminating the need for manual work, eliminating the need for hard copies of documents, and using scalable systems.

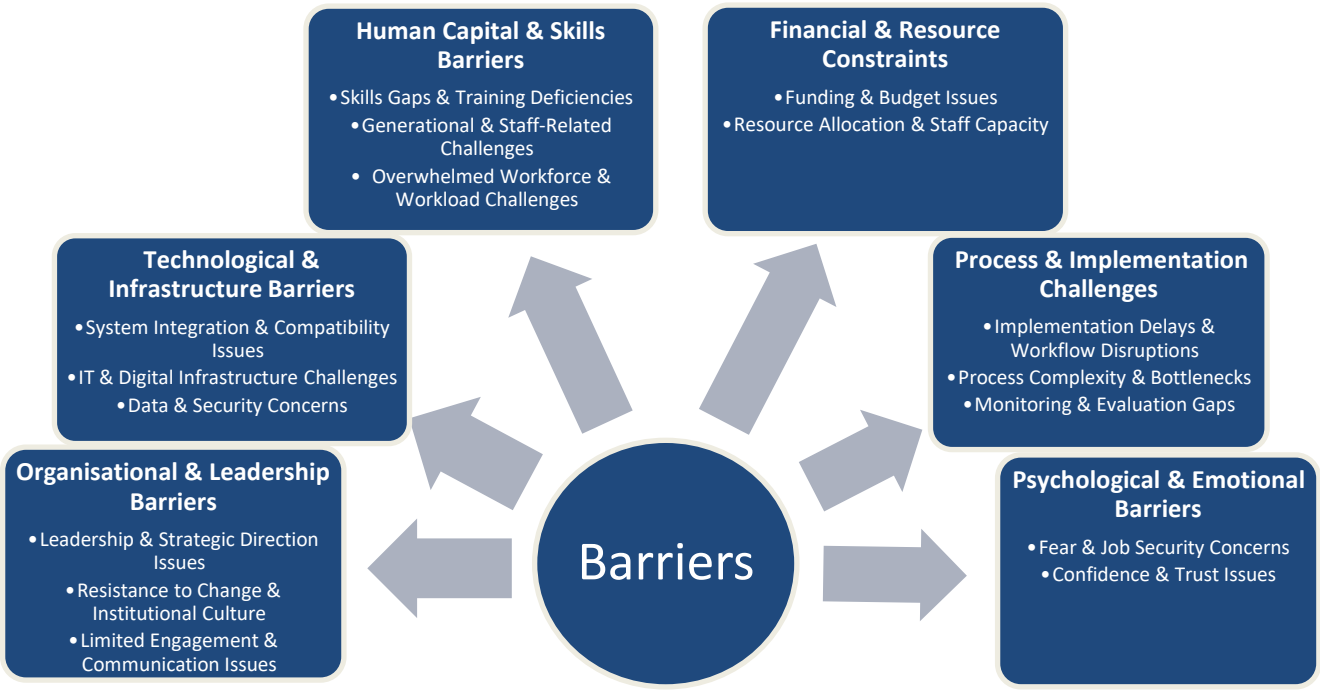
These enhancements have enabled institutions to reconfigure their use of resources to enable future digital opportunities and to achieve financial sustainability and effectiveness in the long term.

4.4 What are the key barriers to the adoption of the implementation of digital transformation from an administrative perspective at a selected public higher education institution?

While there are successful digital transformative strategies being implemented within institutions, significant challenges still exist. This section builds upon the earlier investigation of digital transformation in higher education by exploring the main barriers to its adoption from an administrative perspective. The adoption of full digital transformation has been hampered by several obstacles despite its demonstrated potential to enhance administrative efficiency.

Based on the participants responses, barriers can be categorised into the following themes organisational and leadership challenges, technological and infrastructure limitations, human capital and skills barriers, financial and resource constraints, process and implementation challenges, as well as psychological and emotional resistance to change. The following figure illustrates the key barriers to the adoption of digital transformation strategies in higher education institutions which will be elaborated later in this chapter.

Figure 4.3 Barriers to Digital Transformation in Higher Education Institutions



4.4.1 *Organisational and Leadership Barriers*

Despite the clear benefits of digital transformation, participants have expressed that significant organisational and leadership barriers are major determinants of whether digital transformation efforts are successful or not.

Participant 1 argued that although management support is available, more decisive leadership would enhance the rate of adoption and minimise resistance:

"Management is generally supportive, but stronger directives from leadership could help overcome staff resistance and demonstrate the benefits of these technologies." Participant 1

In addition, Participant 5 explained that failure in project planning may lead to incorrect assumptions on the project objectives and timeline:

"Additionally, miscommunication during project planning can lead to mismatched priorities, which delays implementation." Participant 5

Participant 7 gave a more sceptical opinion, highlighting the absence of executive sponsorship as a major hurdle. They also expressed disappointment with the universal return to the office after the COVID epidemic, which, in their opinion,

was inconsistent with the digital strategy that was implemented during the pandemic. This suggest that they were moving backwards, instead of progressing forward and seizing the opportunities that comes with digitisation:

"There's also a lack of buy-in from the executive level, which hinders progress. Additionally, the university's insistence on returning to traditional work environments post-COVID doesn't align with the possibilities offered by digital tools." – Participant 7

Another issue raised was the concern about the competitiveness of the institution. Participant 7 pointed out that other universities are more active in the implementation of digital transformation, and emphasised the risks of lagging behind the competitors:

"At the management level, there's a lack of understanding about the urgency of digital transformation. Other universities, like UP and UCT, are far ahead in adopting advanced digital tools and collaborative platforms. If we don't catch up, we risk becoming irrelevant." Participant 7

In concurrence with this view, Participant 8 argued that leadership support is often deterred by policy barriers and financial constraints, thus it is important to involve stakeholders early and communicate the project objectives clearly to avoid resistance:

"Management is generally supportive but sometimes hesitates due to policy constraints or resource limitations. Engaging stakeholders early and clearly communicating the benefits can help mitigate resistance." Participant 8

Furthermore, the lack of standardised procedures in the various schools was another issue that emerged. Participant 8 explained that this lack of uniformity is a major hurdle as it affects the implementation of the automated systems:

"The biggest challenges are the lack of standardised processes and resistance to change. For instance, faculties often have their own ways of doing things, which complicates the implementation of universal solutions. Automation thrives on consistency, so these variations delay projects and sometimes diminish their effectiveness. Additionally, resistance from staff—who are accustomed to manual processes—slows adoption." Participant 8

In general, these views show that organisational and management factors such as the lack of executive support, inadequate leadership commitment, and inadequate focus on digital strategies are barriers to digital progress. The institution faces strategy alignment issues, policy ambiguity, and project team fragmentation, all of which slow down digital adoption. The tension from various projects and the constraints on resources put a great deal of pressure on coordination, which in turn erodes the capacity of the institution to fulfil the requirements of the digital initiatives. To remove these barriers, there is the need for stronger leadership, clearer communication, well-defined policies, and integration of work units.

4.4.2 *Technological and Infrastructure Barriers*

Besides leadership issues, the study also revealed major technological and infrastructure issues that hamper the effective implementation of digital transformation strategies in higher education institutions. This consistency in the findings could be attributed to the participants' experiences with system failures, integration problems, and limited ICT support, all of which are detrimental to the efficiency and user experience of operations.

Restricted access and delayed ICT processes were among the first concerns raised. Participant 2 explained the problem of getting access to the necessary systems:

"One major challenge is access. For instance, OnBase isn't automatically available to all staff; we have to request access through ICT. This process is frustrating because it's a tool we all need for our day-to-day tasks. Additionally, some systems require extensive follow-ups to resolve issues, which delays our work and impacts response times to student queries." Participant 2

Participant 3 continued to explain the technical issues that affect document processing and system usability:

"However, challenges remain. For instance, when students upload documents in multiple parts, only the first document gets assigned an OnBase number. This creates

inefficiencies. Additionally, system lags and occasional failures to reflect updated information in checklists can be frustrating." Participant 3

"Additionally, technical issues like system lags and limited SharePoint storage have occasionally disrupted workflows." Participant 3

Although digital tools have enhanced the productivity in many aspects, Participant 4 mentioned that there are still some manual processes and system shortcomings:

"However, despite significant progress in digitisation, some processes remain manual due to system limitations." Participant 4

"While these tools have improved efficiency, they aren't without flaws. For example, our online amendments system reduces paperwork but still has limitations, such as not allowing students to deregister online. We also attempted to automate curriculum planning, but that process hasn't been fully successful yet." Participant 4

Participant 4 also stated the following:

"Additionally, system constraints limit what we can automate. For example, occasional studies applications are still manually processed, which is error-prone and time-consuming. Moreover, ICT support can be slow, making it difficult to implement changes swiftly." Participant 4

Among the issues raised, Participant 5 was concerned with the availability and accuracy of data:

"However, frustrations arise when data is unavailable or incomplete. This highlights the need for robust data governance and accessible reporting tools." Participant 5

In addition to internal system problems, Participant 6 pointed out that one of the major challenges is resistance from various stakeholders on the issue of data security:

"Stakeholder resistance is a common challenge, often due to fear of change or concerns about data security." Participant 6

Participant 7 said that system capabilities are usually not up to the level of user needs and that broader institutional policies sometimes go against digital opportunities:

“Additionally, we need better tools—our current systems are outdated and don’t support dynamic engagement.” Participant 7

“Additionally, the university’s insistence on returning to traditional work environments post-COVID doesn’t align with the possibilities offered by digital tools. External factors, like infrastructure challenges and socioeconomic issues, also play a role.” Participant 7

The effect of the operational impact of delayed system improvements was articulated by Participant 9:

“These challenges delay the resolution of system gaps, forcing us to rely on outdated processes. For instance, while we identify and submit system improvement requests, the slow pace of implementation often means we’re stuck using manual workarounds. This limits our ability to fully leverage digital tools and provide optimal services to students.” Participant 9

Participants 10 brought up the same concerns with regard to poor system integration especially in the financial area:

“While these tools have been effective in many areas, some interim solutions lack full integration, creating inefficiencies. For instance, our e-claim system doesn’t fully integrate with our ERP, leading to challenges like tracking duplicate claims.” Participants 10

“Some systems introduced risks due to a lack of integration, which we are working to address.” Participant 10

Therefore, it can be concluded that many institutions are still using obsolete digital infrastructure that does not have the necessary flexibility and integration for effective running of operations. System constraints, data integration failures, slow ICT response, and unaddressed technical issues continue to pose a challenge. Furthermore, issues on data management, security, and privacy still exist, which make some stakeholders hesitant to adopt digital technologies. These findings show that there is a lack of investment in infrastructure, data standardisation, and cybersecurity to support long-term digital transformation because of the underuse of technologies, poor trust in system accuracy, and reliability.

4.4.3 *Human Capital and Skills Barriers Technological*

Besides leadership and technological issues, the study also revealed human capital and skills as the major factors that pose a threat to the digital transformation process. However, the existence of digital tools has not been without some challenges in terms of staff readiness, digital literacy and organisational culture. These factors determine how well technology is adopted and used in day-to-day business operations.

Participant 2 mentioned that there is a lack of initiatives that were once available for communication and skills enhancement that helped in keeping the staff motivated and informed:

"Roadshows and consultations are essential. Before the pandemic, we had annual roadshows to share updates and gather feedback. These have dwindled since 2020, leaving staff to work in silos." Participant 2

Accountability and decision-making were also raised as concerns. Participant 4 also pointed out that timidity to assume responsibility and make decisions can hold up digital initiatives while also calling for better training programmes:

"There's been some improvement, but accountability remains an issue. Many staff members hesitate to make decisions, preferring to defer responsibility to their superiors. This reluctance can delay problem-solving and hinder progress. Providing staff with the right tools and training could empower them to make more informed decisions." Participant 4

Participant 7 stressed the continuing challenge of enhancing the internal capacity and changing the attitude towards non-classical forms of education:

"However, two years later, we're still where we started due to capacity issues and a general lack of understanding about the power of digital transformation. Additionally, systems like Coursera offer a wide array of digital skills courses, but they're underutilised because they're not seen as traditional learning methods." Participant 7

They also pointed to the lack of engagement with widely available tools, further contributing to inefficiencies:

“Poor communication and underutilisation of tools like ChatGPT or Excel further exacerbate inefficiencies.” Participant 7

Another issue that was observed was the resistance to change. Participant 8 commented on the increased time for engagement and training because of the reluctance of the staff:

“Resistance from staff means we spend additional time on training and engagement.” Participant 8

From a systems development perspective, Participant 9 explained that the absence of sufficient skilled personnel within the ICT section puts a burden on business users in terms of implementation:

“Additionally, the lack of dedicated software testers within ICT means that business users often have to step in to test developments, which can slow down the process. Better resource allocation and training within ICT would make a substantial difference.” Participant 9

Participant 11 also expressed his view on how staff’s refusal to adopt new tools makes them use outdated tools when effective tools are available:

“Resistance creates inefficiencies, as it often results in staff reverting to outdated methods. For instance, some colleagues still rely on Excel spreadsheets even when the system- generated reports provide all necessary information.” Participant 11

Findings derived from the responses highlight that the institutions have insufficient technical personnel who can adequately support digital initiatives. There are few formal training programs, digital literacy efforts receive inadequate financial support, and support mechanisms are not consistently available to enable staff to use new technologies. Generation gap and time constraints hamper the process of moving from analogue to digital workforce. Thus, to move forward with digital transformation, institutions need to focus on upgrading skills, resources, and enabling environments that address the different levels of digital maturity of employees.

4.4.4 *Financial and Resource Constraints*

Financial resources are still a problem, but the participants also identified overwhelming workloads and shortages of staff as the main impediments to the effective implementation of digital transformation. Many of the administrative staff are already overworked and, in some cases, the introduction of new digital platforms is not seen as a solution but as another task to add to the list. These pressures make the rate of change in organisations remain low, as there is resistance to change.

Participant 1 explained that the major challenge of staff resistance is that the staff is already overloaded with other tasks and cannot see the benefits of new technologies in the future:

"However, resistance persists, particularly among staff overwhelmed by existing workloads. Convincing users of the benefits remains a work in progress." Participant 1

This was also affirmed by Participant 2 who pointed out that the excuse for not adopting digital systems was ignorance and the fact that there was more work to do during the change process respectively:

"The unfamiliarity with the changes and the increased workload were major factors." Participant 2"

Participant 5 explained further that the problems include; resistance to change, lack of executive support, and financial constraints as shown below:

"Resistance to change remains a significant challenge, particularly among staff accustomed to traditional methods. For example, transitioning from paper-based to digital invoice processing was met with reluctance. Budget constraints and the lack of executive buy-in also hinder progress." Participant 5

"However, managing workloads and resource constraints remains a challenge." Participant 5

A problem with delays in system development and implementation was also reported to occur rather frequently. Participant 6 explained that these delays

result in underutilisation of the systems and low encouragement of the stakeholders:

"Delays in system deployment hinder productivity and prevent us from achieving desired improvements in processes. When stakeholders lose interest, systems are often underutilised, diminishing their potential benefits. These challenges highlight the need for better capacity management and stakeholder engagement." Participant 6

"Additionally, delays in system development and testing—caused by capacity issues—can affect project timelines." Participant 6

Fear of job redundancy was also noticed as a barrier. Participant 7 said:

"Resistance to change is a major issue. Staff often fear that automation or AI will make their roles redundant." Participant 7

"HRDU is unique because it's not devolved like other HR functions, meaning my reach spans the entire university—academics, support staff, and even their dependents. This makes our work extensive but challenging, especially given our limited team size." Participant 7

As for ICT, the participants mentioned that the main problem was lack of resources. Participant 9 explained how this affects the implementation of projects:

"Resource constraints within ICT are a significant challenge. The department is juggling multiple projects, leading to delays in implementing business requirements and enhancements." Participant 9

Participant 10 offered a broad view of the challenges, underscoring the effects of limited staffing, tight deadlines, and inconsistent processes through the following statements

"A significant challenge is resource constraints. Our team is stretched thin, managing existing systems while supporting new implementations." Participant 10

"Time constraints also play a role, as finance is a deadline-driven environment, leaving little room for staff to focus on digital transformation initiatives." Participant 10

“These challenges slow down progress and strain our resources. For instance, the lack of standardisation means we spend extra time developing customised solutions for different departments.” Participant 10

“Unfortunately, resource constraints limit our ability to explore and present these opportunities proactively.” Participant 10

Analysis of the responses suggests that time pressures, other work commitments, and concerns about job displacement because of automation also make employees resistant to change. Furthermore, the absence of implementation strategies and the lack of defined change management processes have led to ambiguity and uncertainty in the shift to digital workflows. Financial and resource limitations are still a major issue in the digital transformation process.

Some of the institutions face financial constraints, which makes it difficult to purchase the latest digital technologies. According to the study, the costs of digital transformation, including the costs of implementing the solution, maintaining the system, and training the staff are major impediments. Limited resources, weak IT infrastructure, and insufficient funding for technological based projects and initiatives have slowed down the process of digital adoption. Participant also highlighted that the institution has had to put digital projects on the backburner because of financial reasons, thus extension of the phase of moving from traditional administrative processes.

4.4.5 *Process and Implementation Challenges*

Despite financial and human resource limitations, institutions also face challenges related to the process and implementation of digital initiatives. Participants pointed out that inefficiencies in systems and processes, lack of standard operating procedures, and bureaucratic bottlenecks pose a significant challenge to effective adoption.

Participant 2 explained that one of the problems is the misfit between system capabilities and current workflows, and while tools like programme codes have

helped with routing applications, there is no clear communication and policy frameworks to go with them:

"The issue is with the processes not aligning with the systems. For example, programme codes have streamlined how applications are directed to the relevant departments, which is a positive development. However, the lack of clear policies and communication about these changes has created unnecessary challenges. We're often left to pick up the pieces and figure out how to make it work." Participant 2

In addition, Participant 2 brought up issues with the lack of standardisation of procedures and long delays. They argued that without proper policy support, the introduction of new programmes only adds to the already existing administrative pressures:

"However, there are challenges as well. For instance, new programmes were introduced without proper policies in place, leading to confusion and additional workload. This misalignment between processes and systems has made some tasks more time-consuming." Participant 2

Participant 6 also shared some frustrations with delays in system deployment, and how long testing phases reduce stakeholder engagement:

"For example, some systems remain in user acceptance testing for extended periods, leading to frustration and a loss of interest among stakeholders." Participant 6

For instance, Participant 8 mentioned that inconsistency in processes leads to complexity in automation, which in turn slows down the implementation process.

"They create inefficiencies and hinder progress. For example, inconsistent processes require us to build multiple rules into automated systems, which increases complexity and delays implementation." Participant 8

Participant 9 explained that the delays in resolving system gaps force staff to go back to the old manual processes:

"These challenges delay the resolution of system gaps, forcing us to rely on outdated processes. For instance, while we identify and submit system improvement requests, the slow pace of implementation often means we're stuck using manual workarounds. This

limits our ability to fully leverage digital tools and provide optimal services to students." Participant 9

Participant 10 continued the same trend of the challenge by explaining how lack of standardisation poses a challenge to system integration and automation.

"The lack of standardisation in business processes complicates system integration and automation efforts." Participant 10

Based on the collective feedback, it appears that slow system rollouts, misaligned processes, and unclear policies are some of the key obstacles to the implementation of digital initiatives. Bureaucratic complexities and weak project management practices, which only compound these challenges. Furthermore, there are no defined performance metrics and feedback mechanisms, which makes it hard to determine progress or the effectiveness of digital tools. It is therefore possible that without regular evaluation and stakeholder engagement, institutions may stagnate and fail to seize transformational opportunities in their digital journey.

4.4.6 *Physiological and Emotional Barriers*

Although technical and financial challenges are often considered as a challenge, it is imperative to acknowledge the significance of psychological and emotional factors. A prominent pattern of the participant's comments was the resistance to change, which was often motivated by fear, uncertainty, and discomfort towards new technologies.

Participant 1 mentioned that a major source of resistance is fear of increased workload as a result of the need to learn new tools:

"Resistance mainly comes from staff, as they fear additional pressure from learning new tools." Participant 1

They also explained that lack of understanding and trust in new systems like predictive analytics is a key barrier to adoption:

“Awareness and adoption are significant challenges. Many staff members are hesitant to use new technologies due to fear or lack of understanding. For instance, when we introduced predictive modelling to forecast student performance, some staff viewed it as a “black box” and questioned its reliability.” Participant 1

Participant 4 gave a broader view of the resistance, and focused on the opposition of the older and long-serving staff who are less inclined to accept new approaches and fear that automation will lead to their unemployment:

“One major challenge is resistance to change, especially among long-serving staff who are accustomed to traditional methods. They often fear that automation will render their roles redundant.” Participant 4

This sentiment was reinforced in the instances of academic staff and legacy staff that fail to grasp the idea of change as well as the vision for change:

“Yes, particularly among older staff members and academics. There’s a perception that automation could lead to job losses, which creates pushback. Some staff also struggle to understand the vision for change, making it harder to gain buy-in. For academics, it’s often about comfort with existing systems, even if they are inefficient.” Participant 4

Participant 4 explained that job security issues are usually related to the lack of understanding of how the staff roles may be changed*:*

“Fear of job redundancy is a significant factor. Many staff members worry that simplifying processes will leave them without tasks to perform. This fear is compounded by a lack of understanding about how their roles could evolve to include higher-value work. For academics, resistance often stems from a reluctance to adopt new practices or systems.” Participant 4

On the other hand, it was observed that the younger staff were more enthusiastic and adaptable. Participant 4 explained how the younger members of the staff are often the drivers of innovation within the institution:

“Younger staff are generally more open to innovation and technology. I’ve created task teams focused on innovation, and younger team members are enthusiastic and eager to contribute. However, it’s a struggle to instil the same mindset in older staff. They often perceive change as a threat rather than an opportunity.” Participant 4

“However, it’s a struggle to instil the same mindset in older staff. They often perceive change as a threat rather than an opportunity.” Participant 4

Participant 6 agreed that the digital adaptability is the different for each generation and also mentioned the need to establish trust as a key factor in overcoming resistance:

“Generational differences also play a role—younger staff adapt more quickly, while others require more patience and support. Building trust in the systems’ security features is crucial to overcoming this resistance.” Participant 6

They also pointed out how fear of change and concerns over the safety of the information affect resistance:

“Stakeholder resistance is a common challenge, often due to fear of change or concerns about data security.” Participant 6

Participant 7 made the same observations; he stated that the emotional resistance is particularly strong among the staff who are easily frustrated or excluded by the digital strategies:

“Resistance is widespread. Staff often feel overwhelmed or believe that digital transformation doesn’t apply to them. Comments like, "I’m too old for this," or "This isn’t viable for me," are common.” Participant 7

Participant 8 linked resistance to direct contact with new technologies, explaining that the unfamiliarity can create job-related worries:

“Resistance is more common among staff who directly interact with new systems. It often stems from a fear of job redundancy or a lack of familiarity with the technology.” Participant 8

Participant 10 highlighted how proximity to retirement and workload pressures influence digital resistance:

“Yes, resistance is common, particularly among senior staff nearing retirement, who may lack the appetite for change. There’s also resistance from staff overwhelmed by their operational responsibilities, as digital transformation requires additional effort in terms of re-engineering processes and learning new systems. Participant 10

“Another issue is resistance to change among staff and management.” Participant 10

In support of precious assertions, Participant 11 pointed out that the younger generation is more likely to accept the change while the older generation and management often fear automation.

“Resistance is more common among older staff and senior management nearing retirement. Younger managers and staff are generally more open to change and proactive in adopting new technologies. Concerns about job security also contribute to resistance, with some fearing automation might replace human roles. However, these fears are unfounded, as human oversight remains critical.” Participant 11

“Resistance to change has been a recurring challenge. Some staff fear losing control over processes or believe automated systems could render their roles redundant.” Participant 11

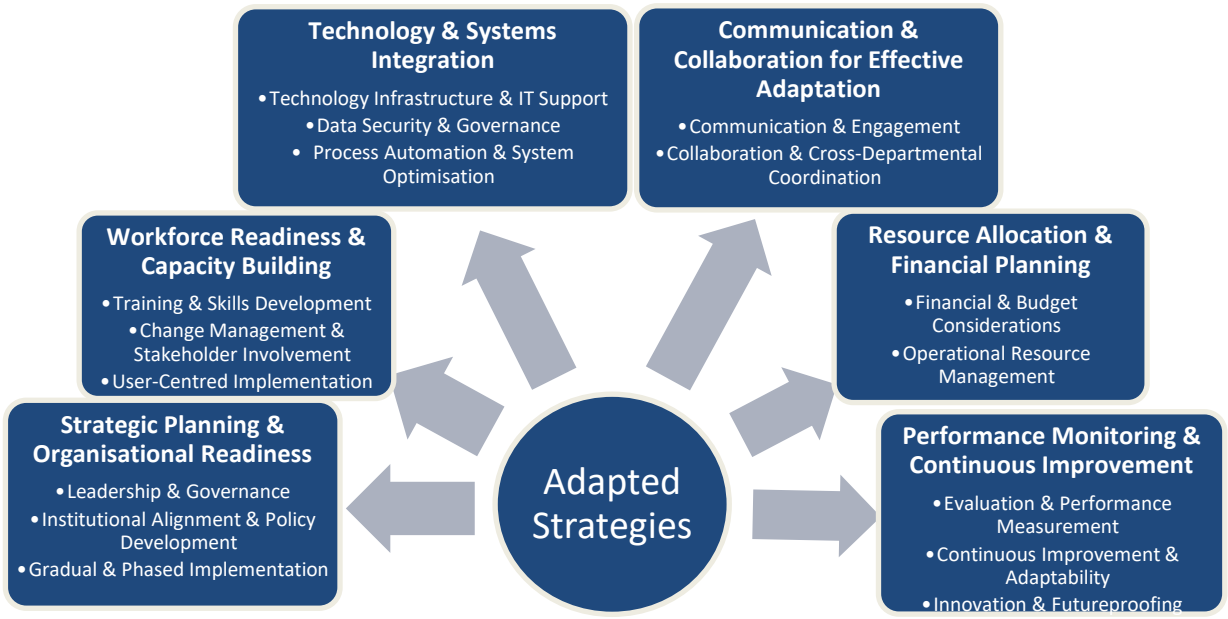
In summary, the results of the study show that the resistance to digital transformation is mainly affected by emotional and psychological factors such as fear of losing a job, lack of self-confidence in using new technologies, generational differences, and fear of change. These concerns are further compounded by issues regarding the reliability of the data and the security of the systems. These emotional barriers can be broken through technical training, clear communication, effective change management, and trust-building support systems that prove that digital tools are not coming to replace humans, but to improve on them.

As demonstrated in the study, staff resistance to using new digital tools is caused by job security concerns, negative attitudes toward new technologies, and a preference for conventional work methods. Senior staff members are particularly opposed to digital transformation, which they see as a challenge to their power structures. Some of these include fear of automation, uncertainty about new roles and responsibilities, and anxiety over possible job loss due to automation. Some of the concerns raised include lack of confidence in digital systems, data accuracy, and the reliability of automated processes, which makes it difficult to adopt these systems.

4.5 How can these digital transformation strategies be adapted at a selected public higher education?

While there are successful digital transformative strategies being implemented within institutions, significant challenges still exist. This section builds upon the earlier investigation of digital transformation in higher education by exploring the main barriers to its adoption from an administrative perspective. The adoption of full digital transformation has been hampered by several obstacles despite its demonstrated potential to enhance administrative efficiency. Based on the participants responses, barriers can be categorised into the following themes organisational and leadership challenges, technological and infrastructure limitations, human capital and skills deficits, financial and resource constraints, process and implementation challenges, as well as psychological and emotional resistance to change. The following figure below illustrates strategies that HEI's can make use of to enhance their digital maturity.

Figure 4.4 Adapted Transformative Strategies for Higher Education Institutions



4.5.1 *Strategic planning and organisational readiness*

To address the many challenges to digital transformation, institutions must embrace a clear and systematic approach to adaptation. A major success factor that has been identified in this study is the compatibility of digital initiatives with institutional goals and objectives, and this is guided by strong leadership and strategic planning. In general, the participants agreed that strategic direction, organisational readiness, and leadership are important to the realisation of effective and sustainable digital change.

Participant 1 argued that although leadership support exists, it is not very well defined and more proactive in guiding digital initiatives:

"Management is generally supportive, but stronger directives from leadership could help overcome staff resistance and demonstrate the benefits of these technologies." Participant 1

This need for structured oversight was further reinforced by Participant 5 who emphasised the need for solid data governance and knowledgeable and informed executive leadership:

"This highlights the need for robust data governance and accessible reporting tools." Participant 5

"Executive buy-in is crucial. Leaders must understand the costs and benefits of digital transformation and actively support these initiatives." Participant 5

Participant 5 also mentioned the importance of cross-departmental collaboration and agile approaches:

"Flexibility and agility are key. For example, allowing remote work can enhance productivity and adaptability. Additionally, fostering collaboration across departments and ensuring alignment with strategic goals will drive more successful outcomes." Participant 5

Participant 7 advocated for a phased implementation which is a step-by-step approach to digital transformation that should start with small projects and then move to full-scale implementation:

“We need to adopt a more strategic approach. Digital transformation should start small, with pilot projects in specific departments, before scaling up.” Participant 7

In the same way, Participant 8 explained how strategic goals can be cascaded down the hierarchy and how data can be obtained from different levels of the organisation to build momentum:

“Leadership should prioritise cascading strategic objectives to all levels of the organisation. When staff understand the broader goals, they’re more likely to engage with initiatives. Additionally, adopting a mix of top-down and bottom-up approaches can capture valuable insights from those directly impacted by changes. Finally, focusing on quick wins—projects that can be delivered within a reasonable timeframe—will maintain momentum and build trust in the process.” Participant 8

Participant 10 also stressed on the need for leadership and alignment and pointed out that tangible results can be achieved by appropriately aligning resources and defining the value of initiatives:

“Leadership should prioritise digital transformation as a strategic objective, ensuring alignment across all levels of the organisation. Providing dedicated resources and fostering a collaborative culture are key. Additionally, focusing on quick wins can build momentum and demonstrate the tangible benefits of digital transformation to stakeholders.” Participant 10

They ended with a look to the future of how strategic alignment is a key to long-term institutional success:

“Finally, aligning organisational strategies with technological capabilities would ensure that decisions are forward-thinking and support long-term goals.” Participant 10

Findings from the responses suggest that institutions that have successfully embraced digital initiatives have done so because they have involved inspiring leaders, defined strategic goals, and well-defined governance structures. Another finding is that leadership prioritisation has been identified as a key factor and those institutions which have set up dedicated project teams and standardised processes have higher levels of digital adoption. Furthermore, strong data governance frameworks and institutional alignment with digital policies have been determined to be vital in the seamless incorporation of new technologies. Those

institutions that have adopted a systematic approach to policy implementation and have set out clear directives for digital adoption have had fewer implementation challenges.

The evidence from the responses further supports the idea that digital transformation success depends on institutional alignment and policy development. Those HEIs which have integrated digital initiatives within their overall strategic plans have been able to achieve better technology integration. The study reveals that institutions which have well-defined policies and structured implementation strategies in place are well-equipped to manage digital transitions. Moreover, those institutions which participate in benchmarking exercises to compare their digital transformation progress with other universities have gained valuable lessons from best practices and industry standards.

A phased and step by step approach has been identified as a way of reducing resistance to digital transformation. Those institutions that have introduced digital initiatives incrementally as opposed to abruptly have less disruption and higher levels of staff acceptance. Pilot projects, phased rollouts, and iterative improvements have been revealed to be successful in reducing the risks associated with the change management process. Lastly, that those institutions which adopt a flexible approach to digital integration and allow for adjustments and refinements based on stakeholder feedback are more likely to sustain long term digital transformation efforts.

4.5.2 *Workforce and Capacity Building*

It is important that any digital transformation strategy is backed up by significant investments in the workforce. This is because staff need very specific, linked to their particular role, digital skills training that is relevant to their everyday work. This was something that all the participants in this study agreed was crucial in the implementation as well as the sustainability of digital transformation strategies.

Some of the participants mentioned that there should be more structure in the training processes and that there should be support afterwards. For instance,

Participant 1 mentioned that holding roadshows and mandatory training sessions could help address skill deficiencies and foster a climate of creativity.

“Regular roadshows and mandatory training sessions could help bridge this gap and foster a culture of innovation.” Participant 1

However, in addition to the formal training, Participant 1 also noted the importance of raising awareness through other channels that can assist different departments to learn about the digital tools that are available and the advantages of using them:

“Awareness campaigns, such as marketing booklets and brochures, can help departments understand the available tools and their benefits. Regular training sessions and workshops—both for managers and staff—are crucial. We also need to promote data literacy, ensuring everyone understands the importance of accurate data entry and its implications.” Participant 1

Expanding on this, Participant 2 also stressed the significance of engagement and training on tools like OnBase and SharePoint, they argued that the use of these platforms can greatly improve the performance of staff:

“Regular sessions to introduce new tools, share best practices, and address challenges would be incredibly helpful. Training on tools like OnBase and SharePoint should also be prioritized to ensure everyone can use them effectively.” Participant 2

The impact of training on service delivery was reinforced by Participant 3, who explained that better integration and training across systems such as SIMS and Salesforce could ensure consistent advice and guidance for students:

“For instance, if faculties and the enrolment centre had more integrated workflows, students would receive consistent advice. Regular workshops and training sessions on tools like SIMS and Salesforce would also help staff feel more confident in using these technologies.” Participant 3

From a strategic decision-making perspective, Participant 4 stated that it is possible to enhance the decision-making capacity of the staff by equipping them with the right tools and information:

“Providing staff with the right tools and training could empower them to make more informed decisions.” Participant 4

Participant 4 also pointed out that the current technical training programmes should be more diverse and available to all individuals by providing courses on applications like Excel and Adobe, as well as the general ICT skills:

“Education is key. Staff need training to understand digitalisation, automation, and innovation—what these terms mean and how they impact their roles. Courses on tools like Excel, Adobe, and even basic ICT skills would be invaluable. Additionally, better ICT support and clearer communication about system capabilities would help. For example, many staff are unaware of features in SIMS that could simplify their work.” Participant 4

The need for a more strategic and institutional based approach to training was also called for by Participant 5:

“To foster a broader culture of innovation, we need targeted training and an institutional commitment to continuous improvement.” Participant 5

They added that the training should be related to specific positions so that the employees would know how digital transformation affects their daily duties:

“Training programmes tailored to different roles would help staff understand the principles of digital transformation and how they apply to their work.” Participant 5

“Finally, a sustained focus on education and training will empower staff to embrace change and contribute to the institution’s digital journey.” Participant 5

Extending this, Participant 8 explained why external learning is important, and said that workshops and conferences can bring new ideas and best practices to the staff:

“Training is another area of need. Workshops and conferences can expose staff to new ideas and best practices, fostering a more open-minded approach to change.” Participant 8

Participants 9 through 11 also stressed the importance of universal access to digital resources and strong change management.

“Ensuring that all staff have access to and are proficient in using digital tools will also drive transformation and innovation.” Participant 9

Aligned with this view, Participant 10 pointed out that training and change management were important but were not fully developed:

“To address this, we emphasise training and change management, although this remains a work in progress.” Participant 10

They also suggested that there could be more time devoted to the discussion of the new emerging technologies:

“To foster a culture of innovation, we need to dedicate more time to research and showcase the potential of new technologies.? Participant 10

In their opinion, a more collaborative and structured training model could help support the change process across the institution:

“Comprehensive training programmes and greater collaboration between departments would also help build a more robust digital culture.” Participant 10

Participant 11 summed up this opinion by highlighting the primary importance of training in any digital initiative:

“The importance of training and change management cannot be overstated. Ensuring everyone understands and embraces new tools is essential for successful implementation.” Participant 11

Based on the responses, it can be inferred that the higher education institutions that have provided targeted training programmes, staff workshops and upskilling programmes have witnessed higher levels of staff engagement and digital tool competency. The study suggests that those institutions which offer regular training and specific support have enhanced their digital uptake. Also, technical proficiency training and digital literacy courses have enhanced the employees’ confidence in handling the new systems. Therefore, institutions that have staff development as their priority and have established learning opportunities for the staff are more likely to be resilient in the face of technological changes.

The responses disclose that change management and stakeholder involvement are crucial in the adoption of digital strategies. Institutions which have been proactive in managing resistance to change and have created a culture of digital readiness have been more effective in the adoption of new technologies. Coupled with this, awareness campaigns, stakeholder involvement, and frequent communication are vital in reducing resistance. Institutions that have involved key stakeholders at the beginning of the digital transformation process and have provided reasons for the digital adoption are likely to get the support of the staff and students. As a result, when institutions empower staff by including them in decision-making and digital strategy formation processes tend to have lower levels of resistance.

Insights derived from participants indicate that user-centred implementation is a crucial factor that determines the effectiveness of digital solutions. The study concluded that institutions that focus on user experience, usability and accessibility of digital platforms have higher levels of digital adoption success. Those institutions that include user feedback, make the design intuitive, and provide help support features have enhanced the use of digital tools by staff and students. Furthermore, workforce management tools and digital training resources have helped to make the transition smoother by providing staff with the necessary skills to work with the new systems. The success of the digital transformation depends on the technology infrastructure and the IT support.

4.5.3 *Technology and Systems Integration*

The study found out that those institutions that have invested in good digital infrastructure, systems and digital tools have been able to achieve effective management of operations. Participants identified several ways in which enhancement of infrastructure and systems have improved the operations and quality of service.

Participant 2 suggested more cooperation between different departments using shared platforms could help in the formation of solutions and prevent duplication of efforts. They also stressed on the importance of digital equity:

"I recommend creating platforms for collaboration across departments. This would allow staff to share ideas and solutions, reducing duplication of effort and ensuring everyone benefits from shared knowledge. It's also important to address access issues and ensure tools are readily available to all who need them." Participant 2

This was supported by Participant 3 who explained the usefulness of real time communication platforms in improving the response rates:

"We used tools like Slack for real-time communication, which I found very effective for resolving urgent issues." Participant 3

"We should also evaluate whether our systems are fit for purpose. For example, I've found SIMS to be limiting compared to systems used at other universities. Investing in better systems and providing adequate training will make a huge difference." Participant 4

Where the systems have been well linked, the results have been impressive. Participant 6 pointed out that the integration of SIMS with OnBase was a key success factor in improving the management of student's record:

"One notable success is the integration of the Student Information Management System (SIMS) with OnBase. This integration allows us to manage student records more effectively, reducing queues during peak periods." Participant 6

They also explained the advantages of the digitalisation process, stressing that it reduces the reliance on paper documents, increases the level of security and enhances the performance:

"This demonstrates how innovation can spread when initial projects succeed. Digitisation also fosters creativity by reducing the risks associated with physical records, such as damage or loss. Digital systems improve productivity and make sharing records easier, which is especially valuable for departments like HR." Participant 6

For digital systems to reach their full potential, Participant 6 argued that integration, collaboration and training must go hand in hand*:*

"Flexibility and collaboration are critical. Departments must work together to create integrated systems that address everyone's needs. Providing adequate training and involving stakeholders in decision-making will ensure that systems are utilised to their full

potential. Finally, adopting innovative technologies like cloud storage will future proof our operations and drive further efficiency gains." Participant 6

This demand for future proofing of operations was also made by Participant 7 who emphasised the need to go for scalable and cloud-based solutions:

"Investment in cloud-based solutions and scalable platforms would also help future-proof our operations." Participant 7

Participant 9 continued the theme of the need for training by stating that enabling staff to use tools like Excel and BO will increase their data analysis capability and therefore their decision-making capacity:

Investing in training and professional development is crucial. For instance, offering courses on Microsoft Excel, BO tools, and data analytics would enable staff to make data-driven decisions. Participant 9

The responses indicate that ICT support has been identified as a key enabler, those institutions that have a dedicated technical support have experienced fewer technical issues. In addition, the institutions that prioritised attention to system integration to ensure that the new technology is compatible with the existing technology have reported better functionality, efficiency and service delivery.

Data security and governance are critical in the effective implementation of digital transformation strategies. Institutions that have put in place solid data protection frameworks, clear governance policies and practices that guarantee data integrity are in a better position to win the trust of their stakeholders. Secure cloud storage, compliance with digital security standards and strong cybersecurity measures were identified as important for risk mitigation.

Participants also argued that workflow automation and system optimisation have a direct impact on administrative productivity. Those institutions that have effectively implemented automated processes, streamlined the application process and received and exchanging data in real time have reported higher performance.

4.5.4 *Communication and Collaboration for Effective Adaptation*

It is crucial to have good communication and engagement in the execution of digital transformation strategies. The outcomes of the participants' interview revealed that frequent communication, teamwork, and the involvement of all employees in the decision-making process are the key factors that lead to the development of an effective digital transformation culture.

Participant 2 mentioned that although an innovation culture was slowly being developed, it required more structured training and more frequent communication:

"Collaboration and the willingness to learn have fostered a culture of innovation. However, more structured training and regular communication would strengthen this culture further." Participant 2

Participant 3 also agreed that the interdepartmental communication should be enhanced and simply stated that:

"Streamlining communication between departments is critical." Participant 3

Furthermore, the participant elaborated on this by pointing out the necessity to engage administrators in the planning and decision-making process, noting that inclusive engagement leads to higher levels of buy-in and adaptability:

"Involving administrators in decision-making processes would make a big difference. When staff have a say in how systems are designed or upgraded, they're more likely to embrace the changes. Additionally, fostering a culture of continuous learning and collaboration will ensure that everyone adapts to new tools effectively." Participant 3

They also mentioned how giving people a chance to come up with ideas and feedback will create a better working relationship between individuals and the organisation:

"Administrators are also encouraged to propose solutions and think innovatively, which fosters a more collaborative environment." Participant 3

Participant 4 also agreed with this idea and added that the involvement of key staff at an early stage of the digital transformation process may help to avoid complications in the future:

"I believe we need to involve administrators more in the planning stages of digital initiatives. Their insights can ensure that processes are optimised before automation." Participant 4

Participant 8 also stressed the need to remove barriers and develop integration and cooperation of all structures and units of the institution for the full implementation of digital transformation:

"Finally, breaking down silos and encouraging cross-departmental collaboration would ensure that digital transformation benefits the entire institution." Participant 8

This was also supported by Participant 11 who was able to identify improvements in collaboration and communication between consultants and school administrators. They explained how the use of digital tools such as Microsoft Teams has enhanced the institution's responsiveness and use of data:

"Collaboration has improved significantly. For instance, we now have stronger communication between consultants and school administrators. Tools like Teams facilitate quick problem-solving and decision-making. Data-driven insights from reports have also encouraged a proactive approach to addressing issues." Participant 11

They ended the interview with an observation of the need for collaboration in the current world due to the digitalisation:

"Collaboration is key. Working in isolation is no longer viable, especially in a digitally integrated environment." Participant 11

Therefore, based on the findings it can be understood that those organisations that embrace open communication, provide frequent feedback and involve stakeholders in the digital planning process are likely to be successful in implementing digital solutions. The benefit of having open channels of communication and consultation is that it helps to create trust and enables institutions to address problems before they become crises.

Furthermore, the results of the study showed that shared responsibilities are critical for the removal of walls and integration of digital transformation strategies. Those organisations that develop a culture of sharing and learning, supporting each other, and engaging everyone regularly are in a better position to ensure that their staff are well placed to learn, change and create. In turn, this results in more enduring and sustainable digital transformation results.

4.5.5 *Resource Allocation and Financial Planning*

Financial and resource aspects are still important when it comes to the effectiveness of digital transformation strategies. This has been confirmed by all the participants who pointed out that lack of funds, unallocated resources and insufficient personnel can slow down the process. However, they also provided some ideas on how to improve results through resource planning and investment

Participant 10 stressed the need to increase the level of resources in order to address the challenges of digital transformation without overburdening the current personnel:

"Increased resource capacity is critical. Dedicated project teams could focus solely on transformation initiatives without being bogged down by day-to-day operations." Participant 10

From the point of view of the technological investment, Participant 6 explained that the use of cloud computing services can not only increase the flexibility but also control the overall spending for the long run:

"Additionally, investing in cloud-based solutions could improve scalability and reduce long-term costs." Participant 6

Participant 8 explained that one of the biggest challenges in acquiring and maintaining third-party tools is the cost and restricted budgets which typically stifle creativity:

"Budget is a significant factor. Many initiatives require third-party tools, but licensing and maintenance costs are often prohibitive. Additional funding would allow us to explore and implement innovative solutions." Participant 8

These views show that the universities that have been able to raise enough funds, use resources well, and buy affordable and easily scalable digital tools are likely to put in place good digital initiatives. Financial planning is crucial in ensuring the sustainability of the initiative in the long run. Those institutions that have undertaken proper analysis of costs and benefits and have made provisions for the recurring expenses such as licensing, training, and support are in a better position to address the challenges that come with digital transformation.

Besides financial planning, management of resources was also seen as a key determinant of success. Those institutions that have actively addressed the issue of staffing, provided sufficient technological support, and clearly defined the digital investment priorities have not faced many problems during the implementation.

In conclusion, it can be argued that those institutions that adopt a strategic and forward-looking approach to the financing and management of resources are more likely to sustain and enhance their digital transformation efforts. Thus, the alignment of resource availing to transformation objectives and the adoption of future-proof technologies helps universities to develop the necessary resilience and adaptability in the face of continuous digital change.

4.5.6 *Performance Monitoring and Continuous Improvement*

It is essential to carry out the assessment and performance measurement in order to sustain digital transformation initiatives. The participants shared several ideas that clearly reflected the requirement for systematic tracking, continuous improvement, and feedback-driven adaptation.

Participant 5 also pointed out the need for better tools to manage projects and to prioritise tasks among the teams:

“We also need better tools for workforce management and prioritisation, such as project tracking software.” Participant 5

Participant 7 also stressed the importance of incremental change and leadership in the process of keeping the momentum going:

“Continuous improvement is key—this involves revisiting and refining processes regularly. Leadership must also prioritise and support these initiatives to drive meaningful change.” Participant 7

In line with this, Participant 9 provided several insights into the significance of proactive system assessment and feedback loops. They noted that comparing the situation in the institution with that of other universities has been helpful in identifying aspects that need development:

“Administrators are proactive in identifying gaps and suggesting improvements. For example, they’ve compared our systems with those of other universities to identify areas for enhancement. This culture of openness and collaboration drives innovation and ensures that we stay competitive.” Participant 9

They also explained that involvement of various stakeholders, including students and staff, through consistent feedback channels it would result in better and more efficient systems:

“Additionally, fostering an environment of continuous feedback from students and staff will help us refine our systems and processes.” Participant 9

Building on this, Participant 9 also suggested the adoption of more targeted, people-oriented evaluation tools.

“Promoting customer-centric feedback mechanisms would be a game-changer. For example, allowing students to provide detailed feedback on specific steps in the application process would help us identify pain points and address them more effectively.” Participant 9

The findings show that universities with well-established performance tracking systems that are in line with digital transformation strategies and analytics are more effective in terms of process optimisation and operational efficiency than others. Those that carry out routine assessment of digital adoption, tracking of user interactions, and data-informed changes have been more flexible and more persistent in their digital advancement.

Additionally, the institutions that encourage the learning organisation, development, and openness to feedback are well placed to adjust their digital

strategy to meet the needs of the stakeholders. It can be understood from the study that through the process of continuous refinement based on both internal assessment and external review, the institutions are well positioned to sustain their competitiveness and resilience.

A significant learning from the participants was that digital transformation success is a function of the capacity of institutions to articulate the purpose of digital strategies, to identify and address challenges openly, and to plan for the future. Those that have adopted artificial intelligence, machine learning and other new digital technologies in a systematic and strategic manner are most advanced in terms of future readiness.

In the end, those institutions that have integrated innovation into their organisational culture, have invested in scalable and future-oriented technologies, and have linked their digital efforts to both strategic objectives and user experiences are likely to succeed. A systematic approach has been found to support long-term digital transformation. To overcome financial and resource limitations, enhance cooperation between different structural units, and develop a culture of readiness for change, will be critical for the universities that are planning to continue and develop their digital journey in the field of higher education.

4.6 Summary of the findings

In Chapter 4, The findings of the study on the digital transformation of administrative processes in a selected South African public higher education institution are presented. Using thematic analysis with Atlas.ti, strategies, barriers, and adaptation measures were identified as key insights from participant interviews. The study identifies six main digital transformation strategies that increase the effectiveness of administrative processes: Technological innovations and tools, Process optimisation, Change management, Financial and resource considerations, Institutional alignment, and Continuous performance monitoring. These strategies have positive implications for automation, decision-making, collaboration, innovation, service delivery, and financial management.

Participants emphasised the central role of technological tools such as cloud-based platforms, integrated data systems, and AI-enabled automation, which reduced manual workloads and improved service responsiveness. The use of advanced analytics platforms such as Power BI, SAP Business Objects, and Oracle Analytics Cloud was reported to enhance data-driven decision-making, transparency, and institutional agility. Automation of routine processes, such as document workflows and student engagement through chatbots and self-service portals, led to increased efficiency and a better user experience for both staff and students.

However, several barriers exist that prevent full adoption. Organisational and leadership challenges such as the lack of executive buy-in, insufficient communication, and siloed decision-making were repeatedly cited. Technological and infrastructure limitations also posed challenges; outdated legacy systems, slow ICT response times, poor integration, and inconsistent access hindered digital progress. Inadequate digital literacy and training meant that many staff members lacked the digital capital required to confidently adopt new tools. Financial and resource constraints continue to be a significant issue, making it difficult to sustain digital initiatives over the long term. Furthermore, psychological and emotional resistance particularly from older or overwhelmed staff has emerged as a subtle yet influential obstacle, driven by fears of redundancy or discomfort with change.

To overcome these challenges, the findings suggest that digital transformation requires strategic planning, leadership commitment, and a phased approach to implementation to succeed. The importance of workforce readiness and capacity building through targeted, role-specific training and broad stakeholder engagement was consistently emphasised. Institutions must also invest in modern infrastructure that ensures system compatibility, integration, and robust data governance. Collaboration across departments, communication strategies that foster transparency, and strategic financial planning are necessary to support sustainable transformation. Monitoring and iterative improvements should be embedded to refine processes continuously and respond to evolving technological demands.

Importantly, the findings show that while themes were analysed within the framework of each research question, strong interconnections exist between them. Many of the strategies, impacts, barriers, and adaptation measures overlap, reflecting the complexity and systemic nature of digital transformation. For instance, process optimisation, driven by automation and AI, is a core focus across all research questions, reinforcing its critical role. Change management emerges both as a key enabler and a recurring barrier, suggesting that communication, leadership, and stakeholder engagement must be systematically embedded in transformation plans. Similarly, financial planning and resource availability are cross-cutting themes that influence both the capacity for implementation and long-term sustainability. Data-driven decision-making, while enabling strategic agility, also introduces concerns related to security, integration, and trust highlighting the need for institutional maturity in data governance.

The digital literacy and readiness of staff is another dominant theme. It shapes how digital tools are adopted and impacts user experience, organisational efficiency, and innovation capacity. As such, a culture of continuous learning and adaptation must be developed to address the generational and confidence-related gaps identified. These interlinked themes are further illustrated in the table below, showing the connections across the research questions and the recurring patterns in the findings.

Table 4.1 Cross-Referenced Themes Across Research Questions

Theme	Enabling Factors (RQ1a)	Impact (RQ1b)	Barriers (RQ2)	Adaptation (RQ3)
Technological Innovations & Process Optimisation	AI & automation, cloud platforms, workflow integration	Increased efficiency, data-driven decisions, improved UX	System compatibility issues, outdated IT infrastructure	IT investment, phased implementation, training programmes, performance monitoring
Change Management &	Leadership support, digital literacy	Increased collaboration,	Resistance to change,	Awareness campaigns,

Stakeholder Engagement	programmes, communication strategies	smoother digital adoption	organisational silos, lack of buy-in	leadership involvement
Financial & Resource Considerations	Investment in digital systems, cost-benefit analysis	Reduced manual workload, long-term cost savings	Budget constraints, high implementation costs	Strategic budgeting, phased implementation
Data Management & Decision-Making	Data-driven insights, analytics platforms, reporting	Enhanced transparency, better planning	Data security risks, lack of integration	Strengthened data governance, analytics integration
User Experience & Digital Literacy	Staff training, user-centred design, self-service portals	Higher adoption rates, smoother digital interactions	Staff reluctance, lack of structured training	Targeted training programmes, staff incentives, continuous learning and improvement

In conclusion, the findings of the study establish that digital transformation can greatly enhance efficiency of administrative processes in the higher education sector. But its effectiveness requires a holistic strategy that encompasses alignment of strategic planning, technology deployment and development of the human capital, as well as management of behavioural, cultural, and financial barriers. By deliberately applying a universal comprehensive digital transformation framework to the local setting with leadership, collaboration, and constant improvement, institutions can overcome the barriers and move steadily toward digital maturity.

CHAPTER 5. DISCUSSION OF THE RESULTS OR FINDINGS

5.1 Introduction

In this chapter, the key findings presented in Chapter 4 are analysed in relation to the existing literature reviewed in Chapter 2. Additionally, the thematic interconnections identified during the analysis are explored to provide deeper insights into the study's findings. The objective is to critically analyse the discoveries and highlight similarities, differences and potential explanations for the observed outcomes. The discussion is structured round the research propositions and the cross-theme connections between them which include technological innovations, process optimisation, change management, stakeholder engagement, financial constraints, data governance, and strategic planning.

The results show a high level of linkages between digital transformation strategies, their impacts, barriers and adaption strategies. These connections are depicted in thematic networks which show how enablers and barriers of digital transformation are applied in the HEIs. The last section provides a summary of the findings and their implications for future research and institutional policy.

5.2 Demographic Profile of Participants

The participants' demographic profile was analysed in relation to the research problem to determine its relevance. The sample, which consisted of 11 people, was drawn from administrative staff and management personnel in a South African public higher education institution and included only those who were involved in digital transformation initiatives. The participants were diverse in their roles and experience which gave a comprehensive view of the challenges in respect of administrative efficiency and digital adoption. The study revealed that the participants had at least five years of experience in administrative role which made them capable of determining whether there was change in the work

processes before and after the digitalisation process. These demographics are important because they provide a picture of different levels of digital competency, willingness to adopt new technologies, and digital transformation resistance within the institution.

Looking at the demographics of the participants, a significant finding was the differences in digital literacy levels among the participants. Some employees were very conversant with the use of digital tools while others had challenges with digital adoption especially in areas that required technological skills to be efficient and productive. This revealed a digital divide, meaning that there were gaps in digital skills, thus pointing to the need for training and building capacity to support digital transformation strategies. Moreover, the variation in digital literacy among participants supports Technological Determinism Theory (Chandler, 2000), which asserts that the capacity of an institution to adopt digital change depends on its existing technological infrastructure and the technological knowledge of its staff.

The presence of senior management in the sample provided a glimpse on how leadership affects the success of digital transformation strategies. Based on the researchers' observations the influence of leadership commitment was important in encouraging the use of digital technologies and in overcoming resistance to change. This is in line with Uzule and Verina (2023) who pointed out that digital transformation is only possible with a competent workforce and the right support from the institution and aligns with the Transformational Leadership Theory developed by Bass and Riggio (2006) which states that leadership is an essential driver of innovation and change within organisations.

5.3 Discussion pertaining to Proposition 1: Digital Transformation Strategies in HEIs

The first research proposition focused on the way that technological innovations affect the administrative efficiency of higher education institutions. The outcomes showed that digital transformation strategies have a significant impact on enhancing the operational efficiency of institutions through the application of

artificial intelligence, cloud computing and automation in the administration department. It also found that the automation of the regular functions reduced the time for processing, enhanced the operational efficiency and avoided bureaucratic delays. The use of cloud-based platforms also improved the accessibility of the administrative data and thus real time decision making and workmanship among the staff. Big data analysis has contributed to the enhancement of institutional strategic planning by providing important information that enables the administrators to make the right decisions on the use of resources and the improvement of the processes.

These findings are in consensus with those of Mhlanga (2024) Alenezi and Akour (2023), and Jimoh and Adenekan (2024), who stresses the importance of digital platforms in enhancing the administrative performance in the higher education sector. However, system integration issues arose due to inadequate digital infrastructure. Participant 7 stated:

"Our network infrastructure is outdated, and it struggles daily to handle the new digital platforms. We often experience downtime, which disrupts productivity immensely." Participant 7

The case studies of Prince Sultan University and King Saud University support this view, which shows how the use of AI in data analysis and cloud-based financial systems has greatly enhanced the administrative performance (Alenezi & Akour, 2023). The study also established that digital transformation enhances the organisational flexibility by enabling the institutions to meet the challenges of external factors such as changing needs of students, changing regulations, and financial constraints. This is in concurrence with the study by Jimoh and Adenekan (2024) who state that flexible administrative structures help universities to develop and innovate. Participants mentioned that such digital tools as LMS, SIS, and cloud-based financial systems enhanced workflow integration, eliminated administrative duplication and helped universities to improve their service delivery.

Despite these advantages, the study also revealed some barriers that hindered the implementation of digital transformation strategies. This was because one of

the most serious problems was system integration and compatibility; that is, many respondents mentioned that the current digital infrastructure of the institution was inadequate and unable to fully support the new digital technologies that were being introduced. This led to shortcomings in the transformation process because the employees had to work with systems that were not meant to work in sync. These findings are in line with Institutional Theory (Scott, 2004) which state that regulatory frameworks, policy barriers, and institutional traditions are determinants of effectiveness or failure of technological implementation. Such institutions that have no well-defined digital policies and infrastructure suffer from severe limitations in the integration of the technological facilities, which in turn hamper the efficiency of the digital transformation process.

The study also established that although the use of automation and workflow management was useful, they required sufficient funding and technical support to ensure the long-term viability of the project. Financial barriers were thus seen as a major issue that hindered institutions from allocating resources to digital infrastructure, IT personnel and digital literacy programmes. These findings are in conformity with Trevisan et al. (2023), who state that financial constraints and system integration problems are the main challenges to digital transformation in public sector organisations. Participant 10 emphasised:

“Increased resource capacity is critical. Dedicated project teams could focus solely on transformation initiatives without being bogged down by day-to-day operations.” Participant 10

Through this statement the lack of resources means that digital efforts are partial, and transformations cannot be maintained in the long run.

In theoretical frame of reference, these findings are consistent with Lean Management Theory (Womack, Jones, & Roos, 1990) which focuses on the elimination of waste and the enhancement of value stream to enhance business performance. Automation, AI-based decision making, and digital workflows are all concepts that are closely associated with lean management because these concepts involve the elimination of waste. However, the study also based its conclusions on Technological Determinism Theory (Chandler, 2000) which states

that technological developments cause organisational changes. Participants' accounts indicated that whenever new technologies were introduced, the administrative workflows had to be restructured, and the employees had to acquire new skills to effectively work with the digital tools. This supports the proposition that organisations should regard it as their duty to upgrade their technology infrastructure, retrain their employees and create a culture of digital transformation as technological advancement is the only way through which organisations can grow.

Furthermore, Change Management Theory (Kotter, 1996) provides an important view on the difficulties encountered in the process of change management in the context of digital transformation. The study showed that the major drawback was resistance to change, since many employees were not willing to use new technologies due to ignorance, fear of losing their jobs and low level of digital skills. Those institutions that had well defined change management structures, stakeholder management processes, and leadership driven digital adoption models were better placed to deal with these challenges. This finding agrees with Kotter's model which outlines the need to have clear communication, constant participation of people, and leadership as critical drivers of change.

In analysing the effects of digital transformation on institutional strategy, the study showed that digital adoption is not only a way to increase the effectiveness of the administrative functions but also a way to make the institution more resilient in the future. The findings of the study revealed that higher education institutions need to include digital transformation as a strategic planning component in order to build long term resilience and adapt their operations to the changing environment. This is in line with Digital Transformation Theory (Bharadwaj et al., 2013) which states that digital transformation is a process that should be implemented in a continuous and evolutionary manner in order to address the strategic objectives of the institution and the environmental shifts. Those institutions that did not align their digital strategies to their strategic plans were less effective and struggled with the retention of technology infrastructure.

A major discovery made in the study was the effect of digital transformation on organisational agility. The institutions that implemented AI based automation,

data analysis and digital process reengineering were in a better place to respond effectively to external threats. The flexibility of the administrative workflows, student admissions, financial management and faculty administration enabled the institutions to adapt to the changing environment in the educational sector.

Nevertheless, the study also established that financial and technological constraints hampered the effectiveness of digital transformation as a way of enhancing agility in the South African HEIs. Some of the constraints included financial restrictions, poor IT infrastructure, and poor access to high-speed Internet and cloud computing services which posed a challenge to their ability to design and implement agile administrative systems. This challenge is in line with the work of Rein et al. (1997) who state that although business intelligence analysts are vital in interpreting current digital trends, institutions need data scientists and AI-based analysis to predict future needs. The results show that without a clear digital strategy and ongoing funding for technology, digital transformation projects may not lead to the long-term results expected.

5.4 Discussion pertaining to Proposition 2: Barriers to Digital Transformation

Proposition 2 posited that the successful digital transformation of higher education institutions is largely hindered by both internal barriers, including leadership issues, cultural issues, and skill gaps, and external barriers, which include regulatory issues, inadequate technology, and financial issues. These barriers were investigated, and the ability to overcome them through structured change management, stakeholder engagement, and financial planning was investigated.

5.4.1 *Internal Barriers to Digital Transformation*

The findings revealed that the internal resistance to change was one of the most important factors that hinder digital transformation in the HEIs. Many employees felt uncertain about moving from the current system traditional administrative processes to a digital workflow because they were concerned about their job

security, lacked digital skills, and were not familiar with new technologies. This resistance was particularly strong in institutions where digital adoption was not complemented by training or awareness programmes and or clear communication plans. These challenges were also exacerbated by organisational silos since different departments worked autonomously which led to inconsistent digital transformation strategies.

Another critical internal barrier highlighted in the study was leadership resistance. Some administrators were leery of digital transformation because they were not very conversant with digital tools or worried about possible disruptions of current business operations. Participant 8 highlighted:

"Leadership should prioritise cascading strategic objectives to all levels of the organisation. When staff understand the broader goals, they're more likely to engage with initiatives. Additionally, adopting a mix of top-down and bottom-up approaches can capture valuable insights from those directly impacted by changes." Participant 8

This statement reinforces Bass and Riggio's (2006) Transformational Leadership Theory. Bass and Riggio (2006) stated that transformational leadership is important in breaking the resistance to change. Those institutions with leaders who led the digital transformation agenda and created a culture of innovation had higher rates of staff uptake of digital tools and more streamlined transitions. On the other hand, those institutions with weak leadership could not be able to overcome the challenges that come with technology implementation.

Cultural resistance was also observed as another challenge in this study. The study concluded that traditional cultures in administrative practices were resistant to digital transformation. Some employees were against the technological changes because they were afraid of becoming obsolete, did not believe that the new systems would be better than the previous ones, or simply preferred the current way of working. These findings are consistent with Firican (2023) who pointed out that cultural rigidity is a major barrier to the implementation of digital innovations. The study reveals that effective digital transformation is impossible without cultural changes which are supported by well-defined change management processes, proper communication, and training to ensure digital capability of employees.

5.4.2 *External Barriers to Digital Transformation*

Beyond the immediate challenges within the organisations, external factors also posed significant challenges to digital transformation. The most important external challenge was financial aspects that were identified as a primary challenge; however, lack of funds was reported as a challenge by most of the South African HEIs in allocating resources to IT infrastructure, training and cloud computing. The findings are in concordance with Zulfikar (2024) who explains that many HEIs are unable to spend money on the right digital technologies and infrastructure because of financial constraints. Many South African universities are financially constrained, which makes it difficult to implement large-scale digital transformation strategies that are sustainable.

This study also established that regulatory and policy constraints were another major external barrier. The study established that compliance with government regulations was a key factor that often-caused delays in the acquisition and implementation of digital solutions. Bureaucratic hurdles made it difficult for institutions to get board approval for the technology spend, which in turn resulted in slow integration of digital tools. These findings are in line with those of Marzougui, Attou, and Arouch (2024) who pointed out that regulatory issues can greatly slow down the digital transformation process in public organisations. Technological infrastructure deficiency also added to the challenges that the HEIs faced. Some of the challenges included lack of IT infrastructure to enable cloud computing, AI driven automation and data analytics as reported by the respondents. Participants mentioned that existing systems were obsolete and did not allow for a smooth integration of new technologies, which in turn slowed down the execution of administrative functions. These findings are in line with Institutional Theory (Scott, 2004) which explains that external factors like government policies and technological infrastructure affect the effectiveness of digital transformation initiatives. The study recommends that to enable digital adoption, government investment and institutional funding should address infrastructure deficiencies.

5.5 Discussion pertaining to Proposition 3: Adapting Digital Transformation Strategies for Public Higher Education Institutions

Based on Proposition 3, given the critical role of Lean Digital Transformation in re-aligning with global best practices and enhancing administrative efficiency, public higher education institutions in South Africa that have integrated Lean principles with digital tools strategically while solving local challenges such as resistance to change and the digital skills gap are most likely to see a significant improvement in operational effectiveness and the creation of a culture of continuous improvement.

5.5.1 *Data Management and Security*

The study showed that data management and security were the critical issues in the digital transformation process. As more institutions began to use digital tools to collect and analyse sensitive data, the risks of data loss, access, and governance increased. Many of the participants stressed the importance of strong cybersecurity measures and data protection regulations to guarantee the reliability of digital channels. Participant 5 underscored this point succinctly:

"This highlights the need for robust data governance and accessible reporting tools." Participant 5

This aligns with Institutional Theory (Scott, 2004), emphasising regulatory compliance and data governance in organisational practices. HEIs are regulated by strict government policies on data governance and non-compliance with these standards has severe legal and reputational implications. The research revealed that organisations that had clear data protection policies were in a stronger position to tackle security risks than organisations that did not have clear cut approaches to management of sensitive data.

In addition, the study is in line with the Lean Management Theory by Womack, Jones and Roos (1990) which explains how data management is crucial in enhancing administrative performance. Those institutions that had streamlined

data processes, automation, and centralized databases were able to improve decision-making, optimise resource allocation and improve service delivery. However, those institutions that relied on outdated or fragmented data systems were less efficient, thus the need to upgrade the digital infrastructure.

5.5.2 *User Experience and Digital Literacy*

The study also shows that user experience and digital literacy are the key predictors of digital adoption effectiveness. Participant 7 recommended a strategic and phased approach to digital transformation:

"We need to adopt a more strategic approach. Digital transformation should start small, with pilot projects in specific departments, before scaling up. Continuous improvement is key—this involves revisiting and refining processes regularly."

This aligns strongly with Change Management Theory (Kotter, 1996), which advocates incremental, continuous, and user-centred change strategies. Employees who perceived digital systems as easy to use and comprehend tended to incorporate them into their work routines; however, those who found them complicated and unclear were rather sceptical about implementing them. The results support Change Management Theory (Kotter, 1996), which acknowledges the significance of people-focused change management approaches that make employees feel comfortable with the technological changes they are expected to adopt.

It also revealed that digital literacy is a critical determinant of the adoption rate. Those institutions that offered formal training and digital skill enhancement exercises used more digital technologies than those that did not invest in digital literacy and thus faced resistance from their staff. This finding is consistent with Bharadwaj et al. (2013) who argued that user-centred digital transformation is more effective. This study recommends that institutions should allocate resources to training, mentoring, and digital literacy seminars to eliminate the skills gap and make the transition to digital working entirely.

The differences in staff's digital literacy helped to reinforce the need for individualised training. Those with limited digital literacy required practical

sessions and step by step guidance, while those who were more tech-oriented required less introduction. Those institutions that developed their digital transformation strategies to consider the varying needs of the users were more likely to have a high rate of adoption.

5.5.3 *Strategic Planning and Long-Term Sustainability*

Strategic planning and sustainability were identified as critical enablers of digital transformation. The study established that the institutions that incorporated digital transformation in their strategic plans were likely to sustain digital initiatives beyond the initial implementation phase. Performance monitoring, continuous evaluation, and iterative changes were vital in the development of digital strategies and guarantee that the technological tools were still applicable to the institutional needs.

These findings are in harmony with the Digital Transformation Theory as proposed by Bharadwaj et al. (2013), which posited that digital transformation is a continuous process that is driven by innovation and adaptation. Those institutions that did not include digital transformation in their overall strategic plans found it difficult to sustain technological developments over time. On the other hand, those HEIs that developed digital investment strategies over the medium term, in tune their leadership with technology, and put in place mechanisms for measuring performance transformed more effectively in their digital transformation efforts. Moreover, Participant 6 provided an example of how initial successes can drive broader organisational adoption:

“For example, our work with the Faculty of Engineering inspired the Faculty of Humanities to adopt similar processes. This demonstrates how innovation can spread when initial projects succeed.” Participant 6

This underscores the effectiveness of integrating Lean Digital Transformation principles (Vukadinovic et al., 2017; Almatrodi & Skoumpopoulou, 2023) to achieve widespread organisational efficiency.

The study conforms to the Lean Digital Transformation approach, which combines lean management with digital technologies to achieve better

performance, reduce costs, and achieve one-plus-one equality through digital transformation (Vukadinovic et al., 2017). The case studies of Prince Sultan University and King Saud University show that integrating digital transformation into the Lean framework improves the adoption rates and institutional performance (Almatrodi & Skoumpopoulou, 2023). The results of the study show that South African HEIs can also copy similar strategies, especially if they are integrated with process optimisation and strategic investment for digital adoption.

Effective strategic planning requires the involvement of institutions in their strategies. The study showed that digital transformation was more effective if leadership, faculty, IT departments, and administrative units had a single vision for digital adoption. Those institutions with misaligned strategies encountered challenges such as budgetary constraints, low stakeholder buy-in, and disjointed digital adoption. These challenges emphasise the need for long-term financial planning, stakeholder engagement, and a clear digital strategy to support transformation initiatives.

5.6 Cross-Theme Analysis and Theoretical Integration

The research findings of this study showed that the themes were interconnected rather than interdependent. Digital strategies such as cloud platforms, workflow automation, and analytics were consistently linked to efficiency gains; however, these benefits were conditional on organisational and contextual factors. While several participants described quicker turnaround times and improved transparency when using integrated systems, the same systems were also associated with bottlenecks caused by legacy infrastructure and fragmented processes. This illustrates that technical enablement without proper organisational readiness produces limited and unstable improvements in business operations.

The relationship between leadership and culture and skills development directly influenced the results of the study. The combination of clear vision statements and training programs from leaders resulted in better staff confidence and system

adoption but workarounds and resistance continued when leaders failed to communicate effectively and did not provide incentives. The different perspectives from participants showed that digital tools either saved time for some users but caused disruption for others because their experience with transformation depended on their job role and digital skills and organisational exposure. The different user experiences and focused capacity development initiatives determine the actual value that organisations can achieve.

External constraints such as policy, funding, and market readiness acted as ceiling effects on otherwise promising internal initiatives. he ability of well-designed pilots to expand their reach became limited because of delayed procurement procedures and insufficient vendor networks and exhausted financial resources. Taken together, these findings suggest that efficiency gains will remain uneven unless institutions coordinate four elements simultaneously: technical integration, change management and communication, skills development and user-centred design, and effective navigation of policy and funding constraints.

The interviews revealed two distinct patterns of thinking which demonstrated these system dynamics. The participants who supported cloud-based workflows highlighted their benefits of quick approval processes and enhanced audit tracking and real-time dashboard access which enabled system-wide integration. The second group of participants reported that the system created excessive work through additional procedures while their outdated networks caused system outages and their staff lacked digital skills especially in departments with minimal computer experience. The same automated system produces different results based on how well organisations maintain their infrastructure and design their processes and train their staff. The technology itself plays a lessor role in determining outcomes because the actual results stem from the combination of organisational elements that surround it.

5.7 The interplay between these findings and theory provides additional insight. The Institutional Theory explains how approval delays stem from coercive and procedural pressures

which affect the speed and sequence of adoption. While elements of Kotter's Change Model, such as vision, coalitions, and short-term wins, were visible, the data show non-linear progress characterised by iterations, reversals, and renegotiations that are typical of higher education contexts. This cautions against the linear assumptions of Kotter's model and points to the need for adaptive sequencing. The leadership actions of different units created visible pathways and protection and purpose which aligns with Transformational Leadership Theory. Finally, the implementation of feedback loops between teams resulted in waste reduction and efficiency improvement which matches Lean and continuous improvement principles. Digital tools failed to transform existing inefficiencies because they lacked mechanisms to implement change.Conclusion

The findings of this study strongly support the propositions put forward. They show that digital transformation strategies are important for improving administrative efficiency, process optimisation, and institutional agility in higher education institutions. The implementation of automation systems enabled by artificial intelligence, big data analysis, cloud computing, and digital workflows has been a significant contributor to the reduction of bureaucratic delays, enhancement of management decision-making, and improvement of general administrative service delivery. Nevertheless, the success of digital transformation is a function of the level of financial and technological support that an institution can mobilise. Institutions with low levels of investment in IT infrastructure, digital training, and standard digital policies have limited and fragmented digital adoption, which hampers the effectiveness of transformation efforts. The study also establishes that proper planning for change management, leadership, and stakeholder involvement is critical for the effective transition of employees to new technologies and processes.

The findings of the research support Proposition 2, which state that internal and external factors are inhibitors of digital transformation in HEIs. Internally, the study found that resistance to change, leadership issues, and cultural barriers were the main problems; externally, financial issues, regulatory issues, and technology infrastructure issues were the major challenges to the scalability of digital initiatives. Those institutions that act to overcome these issues through leadership development, cultural transition management, engagement of stakeholders, and sound financial management are more likely to achieve sustainable digital transformation. Also, Lean Digital Transformation principles can be considered as a viable and strategic way of addressing these challenges. Those institutions that link their digital transformation with change management, strategic investment, and engagement of stakeholders are in a better position to manage the dynamics of digital adoption. Therefore, South African HEIs should focus on the leadership of digital strategy, financial strategy, and regulatory strategy to make the digital transformation strategies sustainable and relevant to the organisation's objectives.

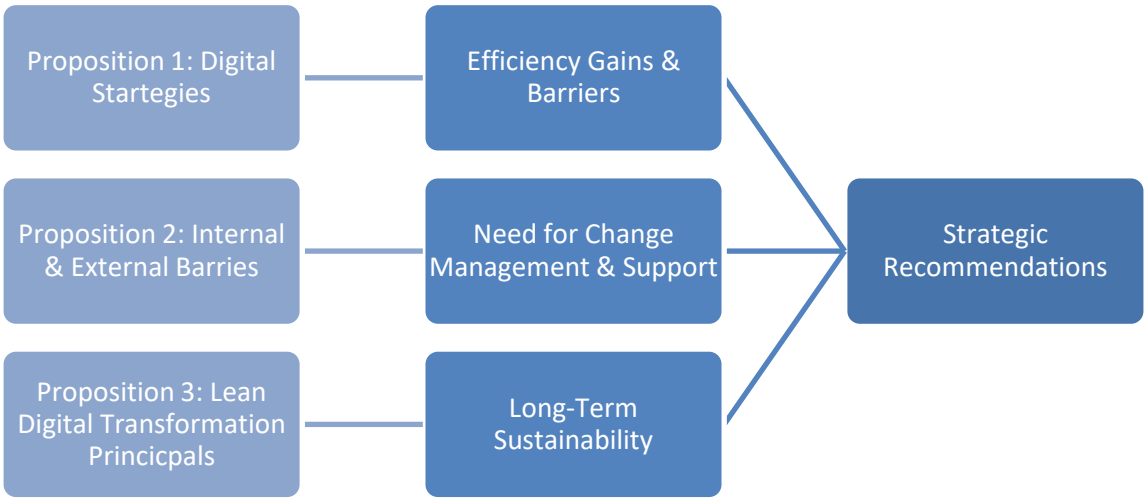
The findings of the study also provide evidence for Proposition 3, which stresses on the importance of long-term strategic planning, financial sustainability, and effective data management for the effectiveness of Lean Digital Transformation. Those institutions that have incorporated digital adoption into their strategic planning, training programmes, and performance measurement systems were more effective in the implementation and maintenance of the transformation process. The research also establishes that data governance is a critical enabler, and that the institutions that focused on cybersecurity, data protection regulations, and data management were better prepared to face risks and improve digital adoption. Institutions that spent resources on user experience, digital education, and change management had higher rates of adoption and less resistance to digital transformation.

It can be concluded that the higher education institutions should address digital transformation in an integrated way applying Lean approach to management of strategic investments and regulatory frameworks as well as people's engagement in the adoption process. Specifically, South African HEIs need to focus on the

long-term financial strategy, structured digital training, and leadership approaches to enable effective digital transformation. Thus, integrating digital transformation into the strategic planning of institutions will ensure that technology adoption is not only sustainable but also adaptive to the future institutional and regulatory environment.

In the future, it is crucial to implement the concepts of continuous improvement, adjust digital transformation strategies according to the performance data, and develop flexible strategies to support the long-term sustainability. This needs a visionary approach that entails combining technological advancement with organisational development, proper governance, and employees' preparedness. The integration of Lean Digital Transformation with Institutional Theory, Change Management Theory, and Digital Transformation Theory provides a clear roadmap for HEIs to enhance their administrative effectiveness, creativity, and readiness to compete in a rapidly changing digital environment. In conclusion, digital transformation in higher education is not only a technological change but a structural change of the institutions which requires visionary approach, financial support and cultural change to realise the full potential. The figure below presents a conceptual map linking the three research propositions to their thematic outcomes and the overall strategic recommendations.

Figure 5.1 Conceptual Map of Propositions and Outcomes



CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This study explored the impact of digital transformation strategies on administrative efficiency in South African public higher education institutions. The research aimed to identify key challenges, best practices, and potential adaptations for digital transformation. This chapter presents the key conclusions derived from the research findings, addressing the research questions outlined in Chapter 1 which are as follows:

- What digital transformation strategies have successfully enhanced administrative efficiency in higher education institutions globally and what was the impact?
- What are the key barriers to the adoption of the implementation of digital transformation from an administrative perspective at a selected public higher education institution?
- How can these digital transformation strategies be adapted at a selected public higher education?

It also discusses the implications of the findings and compares them with the existing literature to synthesize the study's contributions to knowledge. Furthermore, it provides practical recommendations for the stakeholders involved in digital transformation in the HEIs and suggests directions for future research to explore the subject matter further.

6.2 Interpretive conclusions regarding research question 1

The findings indicate that digital transformation strategies are very effective in improving the administrative performance in the HEIs through eliminating

wasteful procedures, repeating themselves, and enhancing the information control. The success stories presented in this paper include those of Prince Sultan University (PSU) and King Saud University (KSU) which support the need for leadership, cultural change and training. Those universities that have effectively integrated digital transformation strategies have done so by implementing technologies like cloud computing, learning management systems (LMS), big data analytics and artificial intelligence (AI). The comparison with the previous research shows that although digital transformation is already present in most global HEIs, South African universities are specific in their position due to socio-economic factors. The literature review also established that challenges such as digital literacy, resistance to change, and financial resources were identified as major challenges in South Africa. However, by tackling these challenges through strategic planning, capacity building and proper funding, public HEIs are well placed to enhance digital transformation in order to enhance effectiveness. This research adds value to the previous studies by offering specific findings on digital transformation in South African HEIs and by suggesting the adoption of Lean Digital Transformation approach to enhance efficiency.

In summary, this study has further confirmed that effective digital transformation in the HEIs is possible only when the technological tools, strategic leadership and capacity building measures are integrated. Although all the global HEIs have embraced digitalisation to a certain extent, South African HEIs have their specific socio-economic challenges that need to be addressed through policy, by enhancing digital literacy and through sustainable funding. This study adds to the body of knowledge by identifying leadership and change management as key digital transformation enablers. Also, it fills the gap in the previous research by examining the impact of leadership and change management on digital adoption.

6.3 Interpretive conclusions regarding research question 2

Although digital transformation strategies are successful, there are several challenges that tend to hinder their success. The next section looks at the key internal and external barriers identified in this study, and discusses their impact

on digital adoption. Internal barriers were classified as leadership issues, resistance to change, lack of skills, and low levels of training. External barriers were defined as regulatory barriers, inadequate technological infrastructure, and financial barriers. Beyond the issues of technological and financial readiness, the study further establishes that institutional leadership and organisational culture are key determinants of the effectiveness of digital transformation efforts.

Organisations with strong executive support and a culture of innovation are more likely to sustain digital initiatives than those with rigid hierarchies and resistance to change, which find it difficult to embed long-term transformation. These cultural barriers can only be addressed through strategic leadership engagement, clear digital policies, and the maintenance of ongoing dialogue between decision-makers and staff. The organisational culture is one of the most significant factors that influence the implementation of digital transformation strategies. This is because institutions with rigid hierarchies and traditional structures are incapable of embracing innovation, which results in slow adoption and poor implementation. Furthermore, the study also established that lack of technical support and inadequate funding enhance these challenges to make HEIs fail to embrace new technologies and educate their staff.

This research is significant as it proposes Lean Digital Transformation as a solution to the above barriers. Thus, with the help of lean principles, institutions can remove waste, enhance flows and develop an environment of perpetual improvement. Also, this study has stressed on the significance of change management frameworks, especially Kotter's Change Management Theory, in creating a digital ready environment.

6.4 Interpretive conclusions regarding research question 3

The findings show that digital transformation strategy should not be implemented in a South African public HEI without a consideration of the existing administrative structure, capacity of staff, and the current technological infrastructure. The study also reveals that digital transformation initiatives should be in harmony with the

strategic objectives of the institution to ensure that they are relevant and sustainable in the long run. Key strategies for adaptation include: Strategic Planning and Organisational Readiness: Digital transformation efforts are aligned with institutional priorities and leadership fully supports the transition. Workforce and Capacity Building: Skill gaps are addressed through training programmes and digital literacy of administrative staff is encouraged. Technology and Systems Integration: Digital tools that are scalable and interoperable and do not cause a significant disruption to business as usual are implemented. Change Management and Stakeholder Engagement: Involvement of all employees is encouraged to decrease resistance and increase the rates of adoption. Resource Allocation and Financial Planning: Digital transformation initiative sustainability is ensured by proper budget allocation and the search for external funding. The study shows that those institutions that have taken a more methodical approach to digital transformation – by exhibiting leadership, training staff, and appropriately allocating resources – have more effective and enduring transformations. In addition, the lessons from the global HEIs reveal that flexibility and the desire to constantly develop are the keys to success in digital transformation strategies.

6.5 Limitations

This paper has some limitations, which are noted below. Although these limitations are not the direct consequence of the study, they help to frame the research within the specific context in which it was conducted and should be considered when interpreting the results.

First, the study was conducted at one public higher education institution, and therefore the findings cannot be generalised to other institutions. However, the chosen institution is representative of the typical South African university in organisation and problems, and the digital maturity, institutional culture, and technological capacity may greatly vary across other institutions, including private universities or those located in another socio-economic context. Hence, the results may not entirely reflect the range of experiences and approaches made within the higher education sector in South Africa or in other developing countries.

As a result, the conclusions reached should be viewed as context-specific analytical generalisations rather than claims that can be statistically generalised across all universities.

Second, the study was limited to professional staff within administration, the academic and pedagogical aspects of digital transformation were not explored. This was purposefully to avoid dilution and to achieve focus and clarity, but it means that the wider organisational effects of digital transformation, particularly on teaching, learning, and research, are not examined. The exclusion of academic staff and students from the data collection process may also have restricted the understanding of how administrative changes relate to other stakeholder experiences and requirements.

Third, the research used a qualitative approach, and the data collection method was semi-structured interviews. Even though interviews are a good way of gaining an in-depth and meaningful understanding of the participants' worldviews and experiences, they can be affected by the participants' perceptions and the researcher's interpretations of the events. To enhance credibility and confirmability, thematic coding and verification were used, but the findings are based on the experiences and views of a relatively small group of administrative staff and managers. Therefore, the conclusions arrived at are theoretical in nature and are based on the perceptions of the participants, which may not necessarily represent the view of the institution or the actual figures.

Another limitation was the time frame and the dynamic nature of the digital transformation process. Since technology and institutions are constantly changing, the findings are valid only at a particular point in time and may not include the latest developments or outcomes. Thus, the digital tools or approaches mentioned by the participants may have been updated or upgraded, or new features may have been added to them, which may cast some doubt on the validity of certain findings in the long run.

The last limitation was that the study did not incorporate quantitative data to enhance or crosscheck the qualitative data. If we were to incorporate performance benchmarks, digital instrument adoption rates, or training hours, we

might have been able to build on the findings and the recommendations made based on evidence.

The study was conducted from an administrative perspective and the enablers and barriers to digital transformation in public HEIs were explored. It presents a clear picture of the actual problems of digital transformation at the institutional level and can be used as a foundation for further investigation and planning for the future in this area.

6.6 Recommendations

Based on the findings, the following recommendations are made to different stakeholders involved in the digital transformation process in HEIs in South Africa:

6.6.1 *For Institutional Leaderships*

Senior management and institutional leadership should lead the way in creating a digital innovation culture by incorporating digital transformation strategies into the institution's strategies and policies. Leadership should promote the development of programmes that are aimed at educating decision makers on how to effectively champion digital transformation. In order to prevent resistance to digital transformation initiatives and enable their easy adoption across the institution, it is crucial that there is a clear top-down commitment to digital transformation initiatives. This paper also proposes that a suitable and systematic as well as comprehensive training tool be developed and executed to assess digital skills gaps and train administrative staff in a systematic manner. This tool should have a step-by-step approach starting with the basic digital literacy and gradually moving to the sophisticated levels of data analysis, automation, and artificial intelligence.

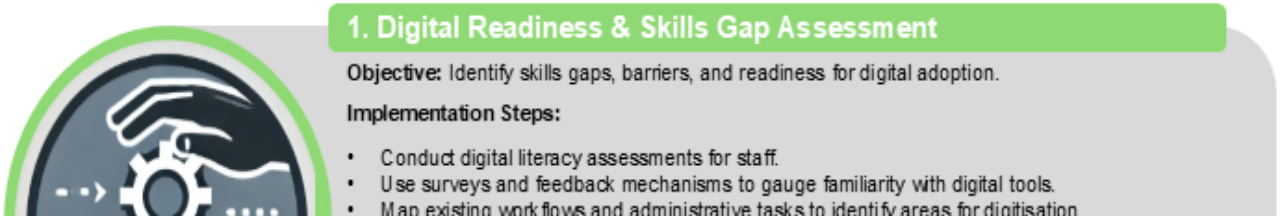
The training tool is predicted to close the digital skills gap by offering a clear and systematic approach to training that can help staff develop the skills they need to work with digital platforms effectively. This will ensure that employees are fully aware of how to use digital tools and systems, thus eliminating the skill gap and

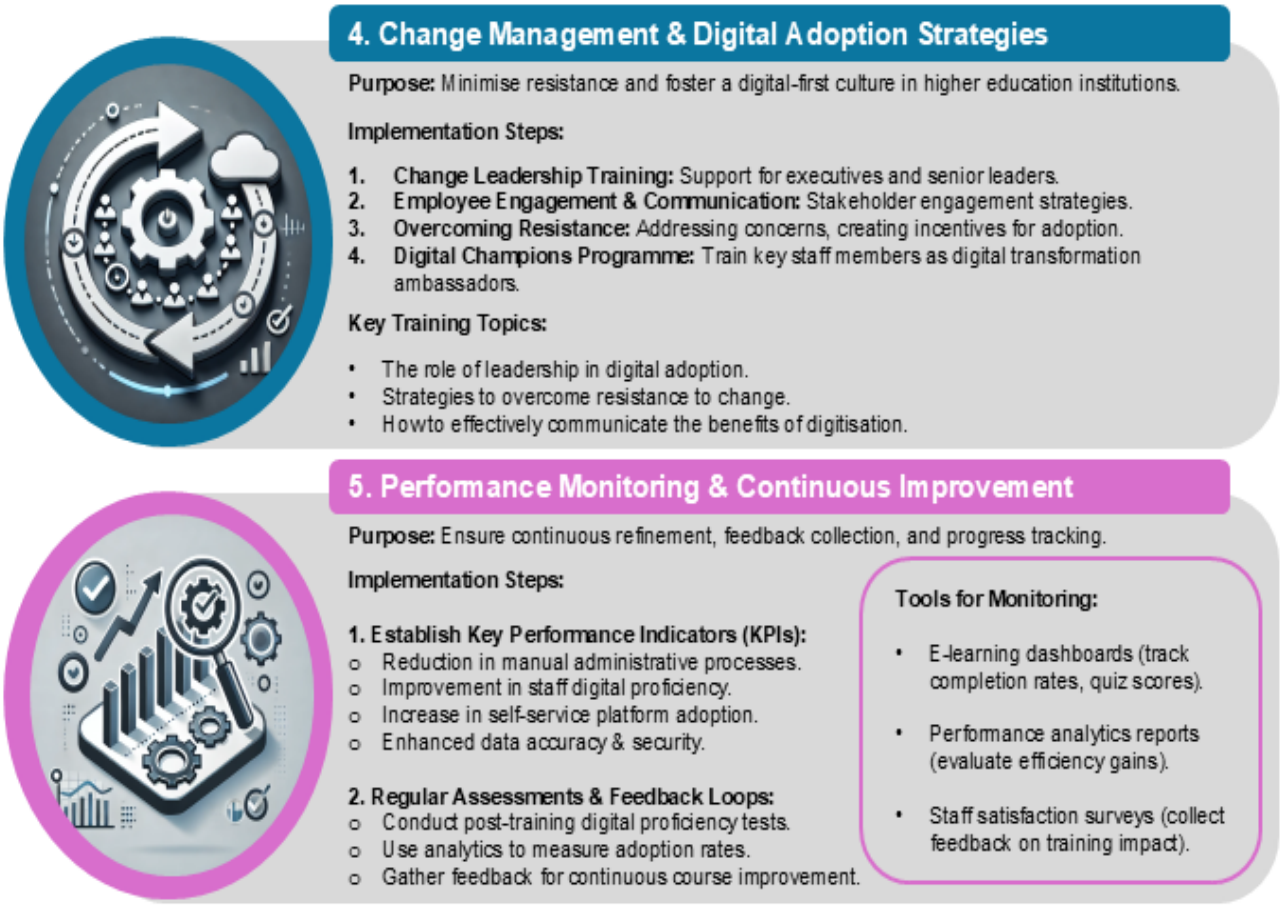
enhancing the overall productivity of staff. Thus, the tool will enhance the digitisation of workflows and, therefore, enhance the efficiency of the administration of the institution, hence, make the work process smoother and less dependent on the time spent on routine tasks. The transition to digital workflows will decrease the time and potential for errors and omissions in all departments.

The main goal is to promote the use of digital tools without forcing people to change their ways. Thus, using training and practical application, the staff will become more conversant with the use of technology, which will lead to the promotion of digital culture. This will also allow for better collaboration and communication using digital platforms. This will help the teams to work more effectively, share information easily and improve coordination within the institution.

Another important result of the training is the optimised data management and analysis. As a result of the improved digital skills of the staff, they will be in a better position to gather and analyse data in order to make the right decisions in the process of planning and executing the various functions of the institution. Furthermore, the training will increase the staff's understanding of cybersecurity and data protection. The staff will be more aware of the proper measures to take when dealing with sensitive information, thus decreasing the chances of security breaches and complying with the data protection policies. This tool comprises of learning, application and change management to create a comprehensive training tool. It is intended to determine the digital skills gap, promote digital strategy, and increase administrative performance by digital transformation and other digital strategies. The figure below is recommended as A Comprehensive Training Tool to determine and bridge the digital skills gap in a systematic way.

Figure 6.1 A Comprehensive Digital Transformation Training Tool





6.6.2 *For Administrators and Staff*

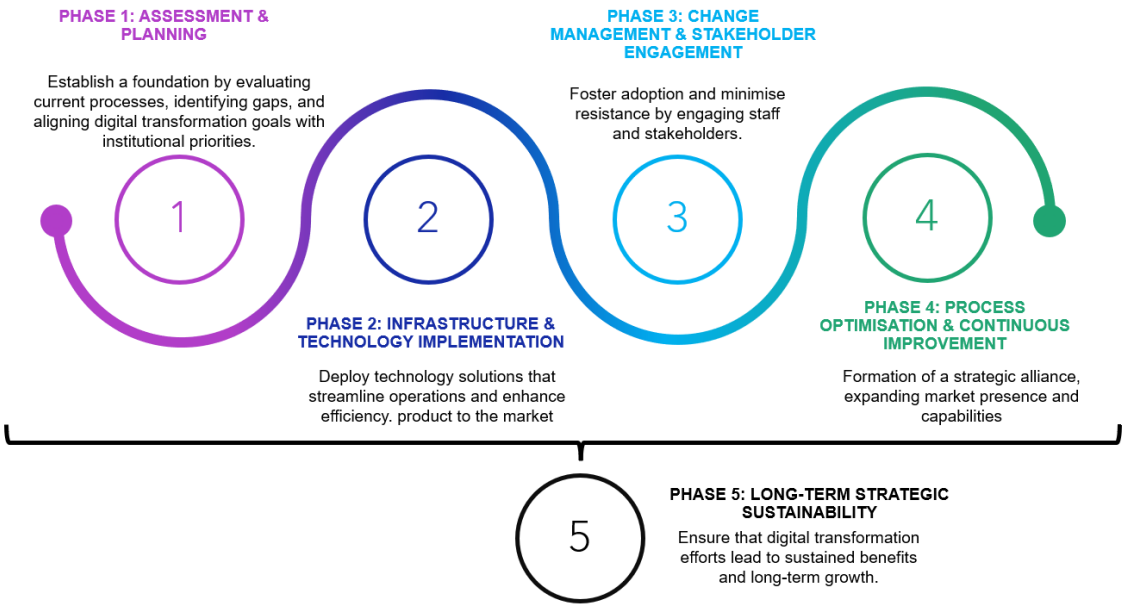
For administrators and staff, there is a need to invest in the continuous professional development of the workforce to improve digital literacy and competency. As displayed in Figure 7 there should be systematically developed training programmes for different levels of digital competency, beginning with the basic digital literacy and ending with the advanced AI and automation skills that should enable staff to use digital tools effectively. To support digital adoption, staff need to be encouraged to collaborate and share knowledge through communities of practice, while also enhancing staff confidence in the use of digital tools and systems. In addition to the training, there should be practical hands-on sessions, peer learning, and mentorship to support the digital transformation adoption.

6.6.3 *For Policymakers and Government Bodies*

Policy makers and government bodies need to formulate policies that will support digital transformation in the HEIs in South Africa through regulatory flexibility and by making sure that the institutions are able to get access to sufficient funding

opportunities. Establishing a national digital transformation framework will assist HEIs in their strategic planning and implementation of digital strategies to enhance digital adoption rates. It is also important for government bodies to provide incentives for the institutions that can effectively execute digital transformation strategies so that more institutions come forward to adopt these strategies. A step-by-step digital transformation implementation roadmap should be implemented to assist institutions through a phased approach towards digital adoption. This roadmap should define specific objectives, measures of effectiveness, and management of resources to guarantee the sustainability of digital transformation strategies. The figure below provides a high-level overview of the key elements that should be included in the Digital Transformation Implementation Roadmap based on the findings. It serves as a guideline for developing a comprehensive and detailed roadmap.

Figure 6.2 Key elements for a Digital Transformation Implementation Roadmap



6.6.4 *For Technology Service Support and Providers*

It is important for technology providers to develop user friendly and affordable digital solutions for the specific needs of South African HEIs. The ongoing technical support and consultation services must be able to ensure the seamless

implementation and the long-term sustainability of the digital tools. The digital transformation solutions must be co-designed by institutions and technology providers to collaborate closely to align with institutional priorities and capacities. Furthermore, the development and integration of digital adoption dashboards will help institutions to monitor their progress, enhance the digital transformation efforts and accomplish the key performance indicators more efficiently.

6.7 Suggestions for further research

While this study adopted a multi-theoretical framework to provide a comprehensive analysis of digital transformation in South African higher education institutions, future research could build on these foundations by applying alternative frameworks. In particular, the Technology–Organisation–Environment (TOE) model (Tornatzky & Fleischer, 1990) may offer additional insights by explicitly linking technological readiness, organisational capacity, and environmental pressures. Using TOE as a guiding framework in future studies could help to deepen understanding of the structural and contextual factors that influence transformation across different institutional settings.

Furthermore, given the limitations of linear models such as Kotter's (1996) eight-step change model—which may not fully capture the iterative, contested, and often unpredictable nature of change in post-colonial educational environments—future research should explore non-linear or emergent models of change management. Such approaches could provide a more nuanced account of resistance, adaptation, and innovation in higher education. Taken together, these avenues highlight the importance of broadening the theoretical lens to capture the complex, multi-level, and dynamic realities of digital transformation in South African and comparable contexts.

Future work should also use quantitative methods (for example, surveys, student performance analytics) and qualitative approaches (for example, focus groups, interviews) to examine the effects of the digital transformation on students' engagement and learning outcomes. Moreover, the subsequent research should explain how the AI-driven automation can enhance the decision-making process

of administrators, and this could be especially important in areas like student enrolment, financial aid, and academic advising.

Thus, the comparison of the results of the studies can be carried out between the different types of institutions (public and private HEIs) and the best and the worst practices can be identified in different educational environments. Finally, the advancement of a specific digital transformation readiness framework for the context of South African HEIs would be useful to evaluate the readiness of the institutions and to offer strategic guidance on digital adoption.

In conclusion, this study adds to the existing body of knowledge on digital transformation in the higher education sector by presenting key strategies, barriers, and solutions. Through the implementation of the recommended solutions, HEIs should be placed in a position to improve the effectiveness of their administrative functions, enhance the quality-of-service delivery and, therefore, remain competitive in the face of changing digital realities. The findings of this study therefore serve as a reference for future work and application in order to ensure that digital transformation remains a strategic and effective tool in the transformation of the higher education sector in South Africa.

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APPENDIX A: Interview Guide

Introduction and Background

1. Can you please describe your current role and responsibilities within the institution, particularly in relation to digital technologies and administrative processes?
2. How long have you been working in this role, and how has your experience with digital technologies evolved over time?
3. Could you share your experiences with digital transformation in both your current and previous roles? How has it impacted your approach to administrative tasks?

Current Digital Transformation Practices

4. What digital tools and systems are currently utilised in your administrative processes? How integral are these tools to your daily operations?
5. In your opinion, how effective are the current digital tools and systems in streamlining administrative processes and enhancing efficiency?
6. Could you provide examples of successful digital transformation initiatives that have been implemented in your department or institution? What were the outcomes?

Challenges and Obstacles

7. What challenges or obstacles have you encountered in the adoption and implementation of digital technologies within your administrative role?
8. How do these challenges affect your ability to perform your administrative tasks efficiently? Are there specific areas where these challenges are more pronounced?
9. Have you observed any resistance to digital transformation among staff or management? If so, what do you believe are the underlying reasons for this resistance?

Impact on Efficiency and Innovation

10. In what ways have digital transformation initiatives impacted the efficiency of administrative processes within your department or institution? Can you quantify or describe these improvements?
11. How have these digital initiatives influenced the culture of innovation and agility among administrators? Have you noticed any shifts in how the department or institution approaches problem-solving or decision-making?
12. Can you share any specific instances where the adoption of digital tools has significantly improved administrative processes or outcomes? What lessons were learned from these experiences?

Future Needs and Recommendations

13. What additional support or resources do you think are necessary to enhance digital adoption and foster innovation within your department or the institution?
14. Are there specific training or professional development needs related to digital competencies that you believe should be addressed to improve administrative efficiency?
15. What recommendations would you make to improve the digital transformation process in your institution, particularly in overcoming the challenges and barriers identified?

APPENDIX B: Cover Letter

Covering Letter [Date]

Dear [Participant's Name],

My name is Tania Melim-Lazorik, and I am conducting a research study as part of my master's degree at the University of Witwatersrand. The purpose of this study is to explore the impact of digital transformation strategies on administrative processes and the culture of innovation and agility within public higher education institutions (HEIs).

As part of this research, I would like to invite you to participate in a semi-structured interview. Your insights and experiences are invaluable to understanding the current state of digital transformation, barriers and identifying opportunities for improvement.

The interview will take 45-60 minutes and can be scheduled at your convenience. With your permission, the interview will be recorded to ensure accuracy in capturing your responses. All information collected will be kept confidential and used solely for academic purposes. Your participation is voluntary, and you may withdraw from the study at any time without any consequences.

Please find attached the interview guide outlining the topics and questions that will be discussed. If you have any questions or need further information, please feel free to contact me at tania.melim@wits.ac.za or 0826293296.

Thank you for considering this request. I look forward to your participation and valuable contribution to this study.

Sincerely,

Tania Melim-Lazorik

Supervisor: University of the Witwatersrand tania.melim@wits.ac.za

0826293296

APPENDIX C: Participant Information Sheet

Good day,

My name is Tania Melim-Lazorik. I am a master's student in the Wits Business School at the University of the Witwatersrand, Johannesburg. My supervisor is Dr Jenika Gobind. This research examines how digital transformation strategies can improve administrative efficiency and foster innovation in public higher education institutions. It aims to identify current challenges and develop a training tool to enhance digital skills and adoption among administrators. The study title is Digital Transformation at a selected South African Higher Education Institution: An Administrative Perspective

I am inviting you to take part in an interview. If you decide to take part, your participation in this research study will last about 1 to 2 hours. The interview will take place online at the University of Witwatersrand during working hours.

With your permission, I would like to audio and video record the interview. This data will be stored in password protected computer for 5 years and/or deleted after 5 years. Only the researcher will have access to the data.

The interview will be confidential and anonymous. When I share the results of the research study, I will not include your name or anything else that could identify you.

If you decide to take part in the research study, it should be because you want to volunteer. You do not have to take part. You can stop being in the study at any time. You do not have to answer any questions if you do not want to. You will not get any direct benefits if you choose to join the research study. You will not lose any services, benefits or rights you would normally have if you decided not to join. Taking part in the research study will not cost you anything. You will not be paid for being in this research study.

The risks for this research study are no more than what happens in everyday life OR some of the questions asked may make you feel sad or upset. If this happens, I will stop the interview and continue another time.

This research study will be written up as a research report. The report will be available on the university library website. If you would like to receive a summary of this report, I will be happy to send it to you.

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za.

Yours sincerely,

Tania Melim-Lazorik

Researcher: Tania Melim-Lazorik,

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Supervisor: Dr Jenika Gobind,

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APPENDIX D: Participant Consent Form

Title of Research Topic: Digital Transformation at a selected South African Higher Education Institution: An Administrative Perspective

Name of Researcher: Tania Melim -Lazorik

Supervisor: Dr Jenika Gobind

I,……....., agree to participate in this research project.

I agree to the following: (Please circle the relevant options below)

The research study was explained to me. I understand what this study is about.	YES	NO
I understand that I can volunteer to take part in the study.	YES	NO
I agree that the interview be conducted online and recorded.	YES	NO
I agree that direct quotations from my interview may be used by the researcher in their research report.	YES	NO
I agree that my participation will remain anonymous (my name or other identifying data will not be used by the researcher in their research report).	YES	NO
I agree that other researchers may use the information I provide in my interview (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on.	YES	NO

…….. (signature)

…… (name of participant)

…… (date)

…… (signature)

…… (name of researcher/person seeking consent)

…….. (date)