
# DIGITAL TRANSFORMATION IN THE ENERGY INDUSTRY

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**ABSTRACT**

Digital technologies continue to disrupt organisations not just as a tool, but as a catalyst for organisational change, redefining competitiveness, workflows, hierarchies, and roles.

The research aimed to explore how digital transformation impacts organisational structure in the Namibian electricity industry. A purposive qualitative research was conducted through online interviews with 13 participants from the Namibian electricity industry.

The research results found that technologies introduced create a drive for digital transformation across the organisations, which modify workflow procedures and business processes, reporting structures, team compositions, roles, and responsibilities, and considerably alters organisational structures. Although digital transformation impacts a shift in organisation structures, the changes are slow, and at a varied gradual rate for the electricity industry.

The research presents an opportunity for both theory and business practice to gain a better understanding on the foundational aspects of digital transformation impact on organisational structure.

A key limitation found is that the participants were chosen intentionally, which may have biased the study's application to the industry population.

Future research suggests exploring leadership & organisational culture influence on the adoption of DT. Secondly, examine the extent to which new business model created from the adoption of digital transformation  a competitive and sustainable electricity industry positioning.

**Keywords**

Digital technologies, digital transformation, organisational structures

**DECLARATION**

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Philosophy [Corporate Strategy] at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AMI | Advanced Metering Infrastructure |
| BM | Business Model |
| CDOs | chief digital officers |
| CIO | chief information officer |
| DT | digital transformation |
| ESI | Electricity industry of Namibia |
| ICT | information communication technology |
| IT | information technology |
| RSQ1 | Research Sub-question 1 |
| RSQ2 | Research Sub-question 2 |
| RSQ3 | Research Sub-question 3 |
| RSQ4 | Research Sub-question 4 |

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# CHAPTER 1: INTRODUCTION TO THE RESEARCH

## 1.1 Background to the research

According to Vial (2019), the adoption of digital technologies is not the means to an end, citing that digital technology is effective but necessitates a wider digital transformation (DT) across the organisation. Introducing digital technology is not just about implementing the technology itself, but rather it should be focused on gaining a deeper understanding of the structural changes that may be necessary within the organisation. This includes examining the roles and skills of employees and understanding the implications that digital transformation may have on the organisation structure (Bouncken et al., 2021). This in turn makes it essential to take a holistic approach to digital transformation that considers all aspects of the organisation, and not just the technology itself.

Organisations that are implementing digital strategy must build supportive organisational structures to drive digital strategy, seeing that scholars agree that organisational structures follow strategy (Hanelt et al., 2021). One of the major challenges of digital transformation is to establish an organisational structure capable of supporting it (Verhoef et al., 2021). To achieve and master speed and collaboration, organisations must reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Traditional bureaucratic organisational structures are rigid and may not adapt well to new market conditions, which highlights the need to introduce new forms of organisational structure better suited to the demands of digital transformation (Mirković et al., 2019). Digital transformation creates informal and formal networks (Bouncken et al., 2021; Kraus et al., 2022), and this demands an understanding of the relationship between digital transformation and organisational structures (Hanelt et al., 2021; Verhoef et al., 2021). This relationship is an ongoing debate in the industry, and scholars have identified an empirical gap in the literature; therefore, the research presents an opportunity for both theory and business to gain a better understanding of the concept of digital transformation and its impact on organisational structure (Vial, 2019).

## 1.2 Research problem

Academics argue that not enough empirical evidence exists on the relationship between digital transformation and organisational structures (Hanelt et al., 2021; Verhoef et al., 2021). This relationship is an ongoing debate in the industry, and the research presents

an opportunity for both theory and business to gain a better understanding on the concept of digital transformation and its impact on organisational structure (Vial, 2019).

Digital technology is disrupting the competitive advantage of organisations in industries (Singh et al., 2020). These disruptions demand change in business strategies (Rozite & Kamiya, 2022; Saunders & Lewis, 2017; Vu & Hartley, 2022) and models which reflects the increasing importance of technology in modern business (Kraus et al., 2022). The disruptive process creates a need for technology integration into overall business planning and therefore requires a wider digital transformation drive (Fitzgerald et al., 2013; Singh et al., 2020; Vial, 2019).

Research, however, has shown that most organisations are either slow to adopt (Kraus et al., 2022), or those that adopt have not yet seen the results across all levels (Bouncken et al., 2021; Fitzgerald et al., 2013; Jayachandran et al., 2022; Warner & Wäger, 2019). This forms an interest in my research question of digging deeper into the nature of DT, its impact on organisational structures, and why some companies successfully transform while others do not (Li et al., 2018).

Due to the challenges faced by the energy industry in keeping up with technological advancements and the consequences of not using it, many organisations have introduced digital technologies to ensure that they create customer value (Ferrag & Maglaras, 2020). This has necessitated digital transformation for utilities (Kanabar et al., 2022). However, academics argue that not enough empirical evidence exists on the relationship between digital transformation and organisational structures (Hanelt et al., 2021; Verhoef et al., 2021). This relationship is an ongoing debate in the industry, and the identified gap presents an opportunity for both theory and business to gain a better understanding on the concept of digital transformation and its impact on organisational structure (Vial, 2019).

### 1.3 Research question

The primary research question for the research is**,** how does digital transformation impact organisational structure?

The sub-questions to analyse and answer the research questions are:

**RQ1:** How do organisations align their structure for a digital transformation journey?

**RQ2:** What is the impact on organisational structure post the digital implementation journey?
**RQ3:** How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey?
**RQ4:** How does the business create and enable self-organising teams that are important for the realisation of digital transformation?

### 1.4 Research aim

The research aimed to understand how digital transformation impacts organisational structure before, during, and after implementation. Furthermore, the research aimed to determine how business align themselves for digital transformation as a result of the introductions of digital technologies. And determine how diverse structures, such as self-organising teams, facilitate digital transformation, as well as how to balance controls and efficiencies within current structures in order to realise value from the digital transformation journey.

This work contributes to the existing body of literature on digital transformation and organisational structure by addressing the gap of how digital transformation impacts organisational structures identified in previous research conducted by scholars (Bharadwaj, El Sawy, et al., 2013a; Vial, 2019).

Finally, the study hopes to suggest a generic structure that would lead to a successful digital transformation path by defining the success criterion for digital transformation. This involves expanding on what is currently known in the literature regarding digital transformation and organisational structure and adding to practice with a workable model for navigating organisational structural demands and changes for the successful implementation of a digital strategy (Bouncken et al., 2021; Gimpel et al., 2018; Hanelt et al., 2021; Singh et al., 2020).

The academic field has taken an interest in the theoretical and empirical nature of digital transformation from a perspective of value creation and competitive advantage in introducing digital technologies (AlNuaimi et al., 2022; Bharadwaj, El Sawy, et al., 2013a; Hanelt et al., 2021; Vial, 2019). However, Vial (2019) argues that the wider business disruptions coming from the introduction of digital technology enable changes in the value creation paths and affect structural changes, which in turn may generate a positive

or negative response from an individual, organisational, and wider industry level. One of these structural changes is organisational structures.

The research explored scholarly gaps, identified by academics and practitioners, in order to determine the impact of digital transformation on organisational structure (Verhoef et al., 2021). Academics agree that no extensive empirical studies have been done on this concept which would help to create empirical evidence of organisational structures that are most effective for digital transformation (Singh et al., 2020). The research further aimed to answer sub-questions on how to balance control and efficiencies within traditional structures and how to create self-organising teams (Vial, 2019) to realise digital transformation (Verhoef et al., 2021). And how organisations required to adopt digital transformation can realise the value in new organisational structures rather than traditional structures. The research contributes to the academic discourse on digital transformation by investigating the impact of digital transformation on organisational structures.

### 1.5 Research scope

The Namibian government has pronounced itself towards the acceleration and adoption of alternative energy mixes other than the traditional coal generated and is pushing for a renewable agenda from a structural, economic, and socio-economic point of view, and as we know, renewables by nature require embedding digital transformation (Ministry of Mines and Energy, 2017a, 2017b).

The electricity industry has also seen a rapid increase in digital technologies being introduced into the utilities (Von Oertzen, 2019). The emergence of new technologies and the obsolescence of older equipment are often key drivers for organisations to undergo digital transformation (Bharadwaj, El Sawy, et al., 2013a). In the energy industry, the adoption of digital technologies can enable more efficient operations, optimise energy production and distribution, and improve equipment monitoring and maintenance (Jayachandran et al., 2022; Oosthuizen et al., 2018; Vu & Hartley, 2022).

In turn, the theory holds that the introduction of digital technologies is not enough and can’t be done in isolation (Kraus et al., 2022; Vial, 2019; Vu & Hartley, 2022). Which necessitates a wider digital transformation. But embedding digital transformation ultimately requires wider organisational change (Vial, 2019). This is because when introducing digital technologies, a margin of manual work is removed, and employees have to be reskilled and or redeployed (Verhoef et al., 2021). Further to this, the use of

technology demands a digital mindset and information communication technology (ICT) support to fully embed the process within the organisation (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020). This means organisations may consider changing their structures that will drive the digital drive. The ICT structure may also require changing from having hardware and information system teams to having teams consisting of analysts, programmers, and chief digital officers (CDOs) (Singh et al., 2020).

Thus, digital transformation impacts organisational structures in that if the structures are not aligned with digitalisation the rollout is impacted (Carton et al., 2023; Morrison & Mota, 2021).

## 1.6 Definitions of key constructs

Digital Technologies

Digital technologies is defined as the use of automated, electronic, or digital tools that facilitate or modify the operational processes of organisations, both internally within the business, among staff, and externally with consumers to improve operational process, collaboration and customer value (Bharadwaj, El Sawy, et al., 2013a; Hund et al., 2021; Vial, 2019).

It is also defined as the introduction and implementation of these technologies concentrated within the field of information technology (IT) (Hund et al., 2021).

Digital Transformation

Vial defines DT as;

> "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (2019, p. 9).

It is further defined as a gradual incorporation of digital technologies, such as the internet, mobile technology, data, and currently AI, in both organisations and industries (Fitzgerald et al., 2013).

Organisational Structures

For the purpose of this study, organisational structure refers to how activities within an organization are pulled together to ensure that goals and objectives are accomplished in

a particular way (Lunenburg, 2012). Organisational structure refers to the formal arrangement of jobs, responsibilities, and authority among persons and groups inside a company.

## 1.7 Research report layout

The research paper has seven chapters. Chapter 1 introduces context of the research by outlining the business necessity for the research including the grounding of the research from a theoretical perspective. The chapter further provides a brief summary of the research topic, and its related research questions.

Chapter 2 is a review of the existing literature on digital transformation and organisational structures. It begins with an overview of common concepts related to digital transformation in the literature and identifies the most relevant ones for this research. This is followed by an examination of digital transformation and how it affects organisational structures including the theory of organisation structures. Finally, it reviews the literature on digital transformation in the energy sector and ends with a conceptual framework based on academic theories.

Chapter 3 establishes the academic focus of the research and presents the research question for the study. It further presents the sub-questions that provided a means to answer the primary research question.

Chapter 4 outlines the methodology of the research followed and further elaborates on the type of methodology chosen and provides the justifications for the research methodology chosen to answer the research question.

Chapter 5 provides the findings of the research as per the research questions and interviews conducted. This is expanded on in Chapter 6 with a discussion on the results in relation to the literature review conducted in Chapter 2.

Chapter 7 concludes the thesis and provides the research findings based on the research interviews with a summary of the key findings, as well as key limitations and future suggestions for further studies.

# CHAPTER 2: LITERATURE REVIEW

## 2.1 Roadmap for literature review

The literature review chapter focuses on examining existing literature related to digital transformation and organisational structures. It begins with an overview of common concepts related to digital transformation in the literature and identifies the most relevant ones for this research in forming the research questions. The literature review further clarifies the drivers of digital transformation by reviewing digital technologies as drivers of digital transformation. This includes how business aligns itself for digital transformation as a result of the introductions of digital technologies.

This is followed by an examination of digital transformation and how it impacts organisational structures, including the theory of organisation structures. And further, to determine how diverse structures, such as self-organising teams, facilitate digital transformation, as well as how workflows and business processes are altered for balanced, controls and efficiencies within current structures in order to realise value from the digital transformation journey. The chapter further examines the literature regarding digital transformation in the energy industry and consequent impacts on organisational structures and concludes with a conceptual framework derived from academic theories.

The conclusion of the chapter summarises the main concepts of the literature review, which serves as the foundation for the research, including the pertinent research framework and research questions and sub-questions to answer how digital transformation impacts organisational structures.

## 2.2 The history of digital transformation: A conceptualisation

Digital transformation has been marked by the gradual incorporation of digital technologies, such as the internet, mobile technology, data, and currently AI, in both organisations and industries (Fitzgerald et al., 2013). In the early stages, research was primarily concerned with the introduction and implementation of these technologies and was largely concentrated within the field of information technology (IT), referred to as digital technologies (Hund et al., 2021).

### 2.2.1 Digital transformation as a response to digital technologies

Over time, the technologies being introduced were evolving very rapidly in all forms of society, industries, and organisations (Westerman et al., 2014). This is now being observed as a multidisciplinary phenomenon drawing on fields such as business,

information technology, innovation management, and organisational behaviour (Feliciano-Cestero et al., 2023). This is because the technologies introduced are having a considerable impact on all forms of business, not just information technology (Reis et al., 2018).

Globally, digital transformation gained prominence with the rise of e-commerce, mobile technologies, social media, and data analytics, and academics and practitioners regard this as the global connectivity enabled by various digital standards and protocols which create value for organisations (Bharadwaj, El Sawy, et al., 2013a; Verhoef et al., 2021; Vial, 2019; Westerman et al., 2014).

Some scholars have gone on to describe the level of impact and analysis caused by the introduction of digital technologies and its influence on the individual, organisational, industry, and society levels (Feliciano-Cestero et al., 2023; Li et al., 2018).

A common theme observed by authors is the varying interpretations of digital transformation (Vial, 2019). There is, however, a universal acknowledgment that digital technologies are disrupting the competitive advantage of organisations and organisations must adopt and digitally transform their strategic imperatives to create value (Bharadwaj, El Sawy, et al., 2013a; Hanelt et al., 2021).

As much as there is agreement for companies to adopt digital transformation due to the rapidly changing environments of most industries (Westerman et al., 2014), a need exists to understand how digital transformation influences organisational structures (Fitzgerald et al., 2013; Singh et al., 2020).

### 2.2.2 Definition of digital transformation

Vial (2019) in his conceptual literature review on digital transformation theorises DT from his framework of the 8-step building blocks and refers to DT as a process of using digital technologies to fundamentally change how businesses operate, deliver value to customers, including the scope and speed, and scale at which these changes extend to a change in organisational structures.

He continues to situate that, the goal of DT is to improve operational performance by embracing the disruptive impact of digital technology on society and industries and consequently the organisation, and because of the use of these technologies disruptions are observed (Hund et al., 2021). This prompts strategic responses and ultimately requires structural changes within organisations (Hitt et al., 2021). Accordingly, scholars argue that the nature and implications of these extended structural changes caused by

digital transformation and how it impacts organisational structures are not well-researched – this is also supported by Verhoef et al. (2021).

Hanelt, Bohnsack, Marz, and Antunes Marante (2021) define digital transformation as an organisational change that is initiated and influenced by the extensive dissemination of digital technologies. Hanelt et al. (2021), however, extend the definition by placing the focus on organisational change: “Organizational change, viewed as a ‘difference in form, quality, or state over time in an organizational entity” (p. 1160).

Vial (2019) conceptually agrees with Bharadwaj, El Sawy, Pavlou, and Venkatraman’s (2013a) definition of digital business strategy. The latter author’s definition positions itself from the fusion of the IT function with business strategy, which the authors refer to as digital business strategy. In this regard, the traditional approach to IT strategy, being regarded as a function that supports business strategy, has evolved over the years (AlNuaimi et al., 2022; Keen & Williams, 2013). This calls for the fusion of the IT function as a strategic digital enabler and thus impacts the organisational structure of the business that adopts digital transformation (AlNuaimi et al., 2022).

This study adopts the conceptual definition of digital transformation as coined by Vial who defines DT as; “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies” (2019, p. 9). Therefore, this suggests merging IT strategy with business strategy to form a concept called digital business strategy which drives digital transformation, as urged by Bharadwaj et al. (2013a).

Bharadwaj et al. (2013a) reflect the increasing importance of technology in modern business disruptive process and the need for it to be integrated into overall business planning and therefore requiring a wider digital transformation drive (Fitzgerald et al., 2013; Singh et al., 2020; Vial, 2019). Research, however, has shown that most organisations are either slow to adopt (Kraus et al., 2022), or those that adopt have not yet seen the results across all levels (Fitzgerald et al., 2013).

As a result, there is a gap in evidence, highlighting insights into why some companies successfully implement digital transformation while others do not (Li et al., 2018). According to Verhoef et al. (2021), digital transformation “has implications for the organizational structure, favoring a flexible structure composed of separate business units, agile organizational forms, and digital functional areas” (2021, p. 4). This necessitated this research.

Also, over the years, a good number of academic authors started focusing on extant literature reviews about digital transformation and its characteristics, including potential future research directions. One of the research directions being emphasized is the empirical probing and understanding of the relationship between DT and organisational structures (Hanelt et al., 2021; Hund et al., 2021; Reis et al., 2018).

### 2.3 Organisational structure and alignment

The nature of digital technologies has evolved, moving from the Web 2.0 to the introduction of social platforms to mobile phones, enterprise resource programs, computer analytics, and cloud, and now to the Internet of Things (IoT), and recently to platforms that alter the way we live and change our work and or interactions with each other including our markets and social environment (Ferrag & Maglaras, 2020; Vial, 2019; Westerman et al., 2014).

It is therefore critical that organisations keep sight of digital technologies disruptions and adjust their digital business strategies and digital transformation strategies to keep a competitive advantage while creating customer experiences (Bharadwaj, El Sawy, et al., 2013a; Von Oertzen, 2019).

Digital transformation thus becomes a strategic response to digital technologies disruption, to fundamentally change how businesses operate and deliver value to customers (Bharadwaj, El Sawy, et al., 2013a). Therefore, the goal of DT is to improve operational performance by embracing the impact of digital technology on society and industries and accordingly advocate for leadership to understand the nature and implication of the structural changes and barriers that affect the drive for digital transformation (AlNuaimi et al., 2022; Feliciano-Cestero et al., 2023; Vial, 2019).

This requires an understanding of structural organisational changes such as organisation structures (Kurzhals et al., 2020); what type of organisational structures are needed to drive digital transformation (Hanelt et al., 2021). Issues such as centralised organisational structure, bureaucracy, and inefficiencies impact how organisations embed the effectiveness of technologies and have been critiqued by scholars (Verhoef et al., 2021; Vial, 2019). According to Verhoef et al. (2021), scholarly gaps pointed out the need to explore the impact of digital transformation on organisational structure, understand organisational structures that are most effective for digital transformation, how to balance control and efficiencies within traditional structures, and how to create self-organising teams to realise digital transformation. And how organisations required

to adopt digital transformation can realise the value in new organisational structures rather than traditional structures .

Thus, this research contributes to the academic discourse on digital transformation by investigating the impact of digital transformation on organisational structures.

## 2.4 Evolution of organisational structures

Companies are formed to accomplish goals or objectives that are set. With this, organisational activities are set and organised to meet these organisational goals (Lunenburg, 2012; Morrison & Mota, 2021). These are set in the form of formal and or informal structures (Carton et al., 2023).

Organisational structures have evolved over the different ages of historic and economic reforms. Especially from the industrial age where mass production was the order of most businesses and scale and scope mattered and production of goods or supply of service was standardised (Hughes et al., 2015).

Then in the industrial age, structure was set with the aim to ensure delivery at mass production. In contrast, the information age realised organisations focusing on creating integrated business processes across different disciplines in the business (Keathley & Harrington, 2020). However, in the age of information, the traditional set up such as specialisation and different key functions was regarded as hampering a fast provision of service and or selling of a product (Cosh et al., 2012; Keen & Williams, 2013; Li et al., 2018; Mirković et al., 2019).

According to Argyres et al., (2020), it is not the evolution of an era that determines structure, citing opposing views in how structures are set. These are organisational structures where outcomes are met through authority and incentives, and organisational structures where outcomes are met through guided knowledge. Teece (1996) however argued, fundamentally organisation forms are evolve or altered by the type of disruptive changes that occurs to gain market competitiveness due to external pressures.

## 2.5 Elements of organisational structures

Conceptually, organisational structures are set up from various elements such as hierarchy, the type of task involved, the roles required, the level of decision-making and the span of control (Hughes et al., 2015; Singh et al., 2020).

Some roles, depending on the type of role, require structured tasks. This refers to tasks that are set in terms of procedures or in a specific way of completing them (Lunenburg, 2012). These tasks are normally ranked at lower levels however the manner in which an entity organises itself and carries out its operations and task is normally based on the interconnections or relationship in either carrying out a task or interconnectedness in achieving an output for the overall organisation (Petriglieri & Petriglieri, 2020).

There are also those roles that need to solve moral problems where decision-making is not structured but unstructured and the level of thinking varies, which may create various paths for one output (Loonam et al., 2018; Singh et al., 2020). This is called an unstructured task and mostly involves organising the structured task.

Another aspect of task is the interdependence of task to form the final output. This requires coordination, planning, organising, and commanding to ensure that business carries out what is required. The level at which decision making happens and autonomy is exercised is key and depends on the whether the task is a rule-based or output-based activity (Cosh et al., 2012; Singh et al., 2020).

Thus, in the information age, the digital technology introduction required the integration of business processes to cut across traditional functions as it focused on customising product for customers, unlike standardising products as in the traditional set up (Carton et al., 2023; Vial, 2019). However, with digital technology focusing on the work setting, digital transformation anticipates the environmental changes across the organisation observed not only in the one workstation but observed in the wider set up of the people's culture, workflows, and the way they work (Singh et al., 2020).

According to Kaplan and Norton (2016), the links to customers, innovation and knowledge workers have an impact on the organisational structure of companies that embed digital transformation. This supports what Petriglieri & Petriglieri (2020) identified to indicated in his study that the top down or hierarchal approach of structure don't adjust in rapidly changing environments.

### 2.6 Organisational structure – a conceptual definition

For the purpose of this study, organisational structure refers to how activities within an organisation are pulled together to ensure that goals and objectives are accomplished in a particular way (Lunenburg, 2012).

Organisational structures are designed to take cognisance of the different tasks including the autonomy of rules and procedures required for various tasks (Hughes et al., 2015). They are also informed by the unstructured task which involves organising, planning, coordination, and the level of interdependence which have an influence on what type of organisation is set for the corporate purpose (Morrison & Mota, 2021). This includes the type of organisation and the rationing between functional requirements and or interdependent requirements (AlNuaimi et al., 2022). Hence, organisational structures are conceptualised around functional requirements and interdependent requirements (Singh et al., 2020; Verhoef et al., 2021). In digital transformation, this has a fundamental setting of the business processes, the functions required, the coordination at various levels, and levels of decision making; therefore, scholars argue that digital transformation creates structural changes (Carton et al., 2023). These changes are dealt with next.

### 2.7 Creation of new roles and job functions – Digital transformation

Literature has posited that digital transformation can create new roles and job functions that require different skills and expertise to support the digital initiatives and therefore impact the organisational structure (Morrison & Mota, 2021; Singh et al., 2020). For example, organisations have been exploring the appointment of information management analyst, social digital marketing officers, and recently chief digital officer (CDO), all or whom specifically focus on influencing the drive for change (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020). Other ICT roles such as chief information officer, chief data officers and chief innovation officers have also been considered in the study of how digital transformation influences organisational structures (Singh et al., 2020).

Regarding these roles, academics have argued that the introduction of the CDO is critical as it drives the change required for digital transformation (AlNuaimi et al., 2022; Hitt et al., 2021; Singh et al., 2020).

This role manages the initiatives that are to be carried out referred to as vertical dimension (Morrison & Mota, 2021; Singh et al., 2020). The role also requires the researching and exploring of new digital-related developments on digital content or technology.

Because digital transformation requires cross management transformation and coordination, the CDO role is positioned to link and align IT to the business environment but from a perspective of change management (Vial, 2019). This is referred to as the horizontal dimension of influencing the organisational structure (Singh et al., 2020).

Thus, CDOs are involved in influencing leadership to support the drive for change (Samimi et al., 2022). Furthermore, the CDOs are required to drive and follow through to realise the output derived from DT. Singh et al. (2020) in their study posit that digital transformation impacts structure through the centralisation concept. They argue that the type of authority exercised, the information that needs to be shared and how it is arranged is all linked to enhancing relationships and building collaboration among different levels of the organisation and therefore require coordination which is horizontal in nature.

CDOs aim to ensure a vertical dimension of digital transformation is achieved by focusing on aspects such what the activities of DT are and how these activities are structured. Further, the focus is on who is responsible for these activities and from where in the organisation the locus of responsibility must be drawn to ensure correct influence is exerted and energy is planted (Singh et al., 2020).

In addition, in the horizontal dimension CDOs are concerned about what type of coordination is required in driving DT successfully and what tools are used (Bouncken et al., 2021; Kraus et al., 2022; Morrison & Mota, 2021). This is where the CDO is entwined with the chief information officer to ensure IT infrastructure is deployed successfully and innovation is encouraged (Carton et al., 2023; Singh et al., 2020).

### 2.8 Creation of technology workflows across the organisation

Digital transformation often involves the integration of technology into workflows and processes, which can lead to changes in how work is done and who is responsible for it. This can require changes to job roles, reporting structures, and decision-making processes and therefore impacting organisational structures (Feliciano-Cestero et al., 2023; Fitzgerald et al., 2013; Verhoef et al., 2021). Most organisation require that an automated system is able to maximise output in terms of organisation goals, however it was seen that at inception efficiencies actually fall according to Petriglieri & Petriglieri (2020) and this require that workflows are reviewed to fit the technology.

Digital transformation requires a culture that is open to change and innovation (Carton et al., 2023; Westerman et al., 2014). Organisations need to foster a culture that embraces experimentation, risk-taking, and continuous improvement, and that values collaboration, transparency, and customer-centricity (Li et al., 2018; Teece, 2007; Weill & Woerner, 2018).

Therefore, DT requires organisations to rethink their structures, processes, and provide ownership to their employee to take responsibilities within their roles and to fully leverage the benefits of digital technologies (Vial, 2019). By doing so, they can create more agile, flexible, and responsive organisations that are better equipped to succeed in the digital age.

### 2.9 Value networks effect organisational structures

Given the interconnectivity of various aspects in business, such as the products, processes, services offered, and the expansion of digital infrastructure, there is a critical need for leaders in organisations to adopt a holistic approach and better their dynamic capabilities to drive digital transformation (Hitt et al., 2021; Teece, 2007).

For example, leadership capabilities enable businesses to adapt to changing digital environments and sustain a competitive advantage when they have the capacity to sense and shape digital opportunities and threats (Teece, 2007). In this way, businesses can identify and respond to new digital technologies and business models enabling value-creation paths (Samimi et al., 2022; Weill & Woerner, 2018). For instance, business leaders can use their ability to seize opportunities to develop and launch new digital products and services that may also increase organisational autonomy and allow functional units to have autonomy over their operations with not just the focus on their units but a more integrated autonomy that solves the organisation autonomy dilemma between functional units and organisational or managerial hierarchy (Dattée et al., 2022). By enhancing, combining, protecting, and restructuring their digital assets, businesses can create a more agile and flexible digital infrastructure that enables them to respond quickly not just within their functional units but also to the changing market conditions and customer needs and thereby also become flexible in changing their digital business strategy to drive digital transformation (Hanelt et al., 2021).

This leads to increased efficiency, productivity, and innovation, and ultimately helps businesses to thrive in the digital era from workplace workflows, responsibilities and roles and consequently requiring a change in organisational structure (Hund et al., 2021; Keen & Williams, 2013; Nadkarni & Prügl, 2021).

The pattern observed in the literature is descriptions of the complex and sequential relationships of DT which also generate barriers to DT adoption and requires deeper insight on how these sequential relationships which are not so much in the information

system domain, can be linked to better understand DT and therefore better understand DT's impact on organisational structures (Bharadwaj, El Sawy, et al., 2013b; Vial, 2019).

## 2.10 Academic gaps in DT and organisational structure – what the scholars are saying

One key change that comes with digital transformation is the structural formation observant in the people, business processes, structures, and culture (AlNuaimi et al., 2022; Singh et al., 2020). As digital technologies are focused on key changes in technology in a task or work setting, digital transformation is observed across the wider business environment where the environment is digitalised and creates value across the organisation, and extends to the external environment. During this process, various teams are formed from innovation drivers to teams running different projects and carrying out different transformation processes. With this, networks are also formed informally and informally (Bouncken et al., 2021; Loonam et al., 2018; Marx et al., n.d.).

According to Verhoef et al. (2021), organisational structures that are positioned to drive digital transformation effectively are a phenomenon that must be understood empirically. In addition, interest and deeper conception must be sought in the type of structures that enable digital transformation and how this positions the type of roles and skills required from employees to drive digital transformation (Singh et al., 2020; Vial, 2019). Critical for the research, are the insights required into which type of organisational structure leadership must adopt to be able to be agile and flexible when disruptions occur (Cosh et al., 2012; Morrison & Mota, 2021). The independence of cross-functional teams and what would create an environment of embracing and inspiring an innovative culture through digitalisation have been studied but must be understood empirically (Bharadwaj, El Sawy, et al., 2013b; Feliciano-Cestero et al., 2023; Hanelt et al., 2021).

The research therefore considered the gap in theory identified by Singh et al. (2020), Vial (2019), and Verhoef et al. (2021) on understanding the nature and implication of digital transformation as mediated by how leadership decisions of what type of organisation structure must be strategically considered during a digital transformation process. Research further aims to understand how the role of the IT function influences digital transformation. Must IT functions remain to solve technological issues or become functions that transform the organisation to be digital? (Singh et al., 2020; Vial, 2019). This further moves into the importance of a company to make strategic moves in attracting employees who embrace digital competencies (Samimi et al., 2022). Hence, a deeper understanding is needed to answer the question of whether organisation

structures that drive DT are flexible (organic) and adapt to rapid changes (Singh et al., 2020). Scholars highlight that little insight is known about what teams drive digital transformation and if these teams must be independent and formed as another business unit or be temporary cross-functional teams (Carton et al., 2023; Morrison & Mota, 2021). To gain clarity, the research further explored the academic debates regarding CDOs in driving the company to adopt digital transformation and how this changes the form of organisational structures (Singh et al., 2020). Digital transformation has a significant impact on organisational structures as it often requires changes to the way that organisations are structured, managed, and operated to fully realise the benefits of digital technologies (Kraus et al., 2022).

One of the key considerations in executing strategy is to set up an organisational structure that will allow an organisation to meet its strategic objective (Samimi et al., 2022). This further requires the forming of relationships organisations must create internally and externally at the decision-making level and the span of control to enhance collaboration and meet customer service (Singh et al., 2020). The same is required when implementing digital transformation (Bouncken et al., 2021; Verhoef et al., 2021). Digital transformation can lead to the removal of hierarchical structures in favour of more flexible and responsive structures (Singh et al., 2020). This can involve the creation of cross-functional teams, the adoption of agile methodologies and business processes (Verhoef et al., 2021), and the empowerment of employees to make decisions and take ownership of their work (AlNuaimi et al., 2022; Kraus et al., 2022; Vial, 2019; Vu & Hartley, 2022). Because digital transformation requires innovation, work structures and activities also change, resulting in the removal of some traditional roles which further necessitates a change in organisational structures and the incorporation of others (Singh et al., 2020). This brings us to the concept of the different roles such as chief digital officer, which have been explored and studied to influence the adaption of digital transformation within an organisation and how this role is two-fold. It has a vertical dimension and a horizontal dimension to influence the drive and adoption of DT (Singh et al., 2020).

### 2.11 Digital transformation in the electricity industry – Namibia focus

The introductions of digital technologies come with a cost. In the electricity industry, digital technologies enable organisations to create value paths such as customer value propositions and networks, digital channels, and agility for the organisation (GIZ, 2022; Glickman & Leroi, 2015; Havle & Dursun, 2019). For example, smart grids and AMI have reduced outages for distributors, improved grid stability for both transmission and distribution, and through AMI increased the accuracy of billing and metering (thus

realising value channels and organisational autonomy) (Nazari & Musilek, 2023). Conversely, the introduction and use of digital technologies have pushed up costs presently curbed through electricity tariff increases which in turn fuel a high outcry from customers (Verhoef et al., 2021). Theory refers to this as digital technology's disruptive nature (Vial, 2019; Wang et al., 2022).

Digital technology fuels various disruptions in that, when companies create efficiencies in the introduction of these technologies, they also create networks and ecosystems which alter customer behaviours and expectations (Hanelt et al., 2021). Theory suggests some electricity industry players have adopted net metering, thus a digital technology has been created, which enhances better data management and organisational autonomy (Dattée et al., 2022) and consumer engagement for these companies but provides the net metering customers with greater visibility into their electricity consumption and costs, which increases the availability of data (Reis et al., 2018). Customers are now able to manage their energy consumption and reduce their electricity bills. Also, as smart grids develop and become "smarter" by advanced communication and information technology, it will be possible for energy users to communicate directly with the grid management entity through block chain (Ferrag & Maglaras, 2020). This two-way communication system allows for more efficient and effective management of the grid (Jayachandran et al., 2022), enabling low demand and customers to sell excess electricity back to the grid during periods of peak demand (Glickman & Leroi, 2015; Kanabar et al., 2022). This creates opportunities for self-generation and storage technologies, to benefit financially from investments in digital technologies disrupting the competitive advantage of the organisation (Verhoef et al., 2021; Von Oertzen, 2019). Therefore, the introduction of digital technologies creates competitive environments in which organisations are forced to adapt and become agile for relevance (Oosthuizen et al., 2018). And therefore calls for digital transformation (Bouncken et al., 2021; Kraus et al., 2022; Vu & Hartley, 2022; Wang et al., 2022). The shift to digital transformation has seen an impact on organisation structures, specifically in terms of restructuring impacted by the adoption of technologies for more agile organisational structure formation rather than the traditional structures known for low organisational autonomy especially on functional units (Dattée et al., 2022).

The Namibian government has pronounced itself towards the acceleration and adoption of alternative energy mixes other than the traditional coal generated and is pushing for a renewable agenda from a structural, economic, and socio-economic point of view, and as we know, renewables by nature require embedding digital transformation (Ministry of

Mines and Energy, 2017a, 2017b). The electricity industry has also seen a rapid increase in digital technologies being introduced into the utilities (Von Oertzen, 2019). The emergence of new technologies and the obsolescence of older equipment are often key drivers for organisations to undergo digital transformation. In the energy industry, the adoption of digital technologies enables more efficient operations, optimises energy production and distribution, and improves equipment monitoring and maintenance which eventually has an impact on organisational structure necessitated from the changes in workflows, responsibilities and job roles (Jayachandran et al., 2022; Oosthuizen et al., 2018; Vu & Hartley, 2022).

In turn, the theory posits that the introduction of digital technologies is not enough and can't be done in isolation (Kraus et al., 2022; Vial, 2019; Vu & Hartley, 2022). Which necessitates a wider digital transformation. But embedding digital transformation ultimately requires wider organisational change (Vial, 2019). This is because, introducing digital technologies, a margin of manual work is removed, informal and formal networks of working are formed and employees must be reskilled and or redeployed (Verhoef et al., 2021). Further to this, the use of technology demands a digital mindset and ICT support to fully embed the process within the organisation (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020). This means organisations may consider changing their structures that will drive digital transformation and provide more autonomy to functions (Jayachandran et al., 2022; Von Oertzen, 2019; Vu & Hartley, 2022; Wang et al., 2022). The ICT structure may also require changing from having hardware and information system teams to having teams consisting of analysts, programmers, and CDOs (Singh et al., 2020). Thus, digital transformation impacts organisational structures in that if the structures are not aligned with digitalisation the (Carton et al., 2023; Morrison & Mota, 2021). These introductions alter the processes within a business and how duties are executed, while for some an alternation of organisational structures is evident and may provide higher organisational autonomy as employees are empowered (Dattée et al., 2022).

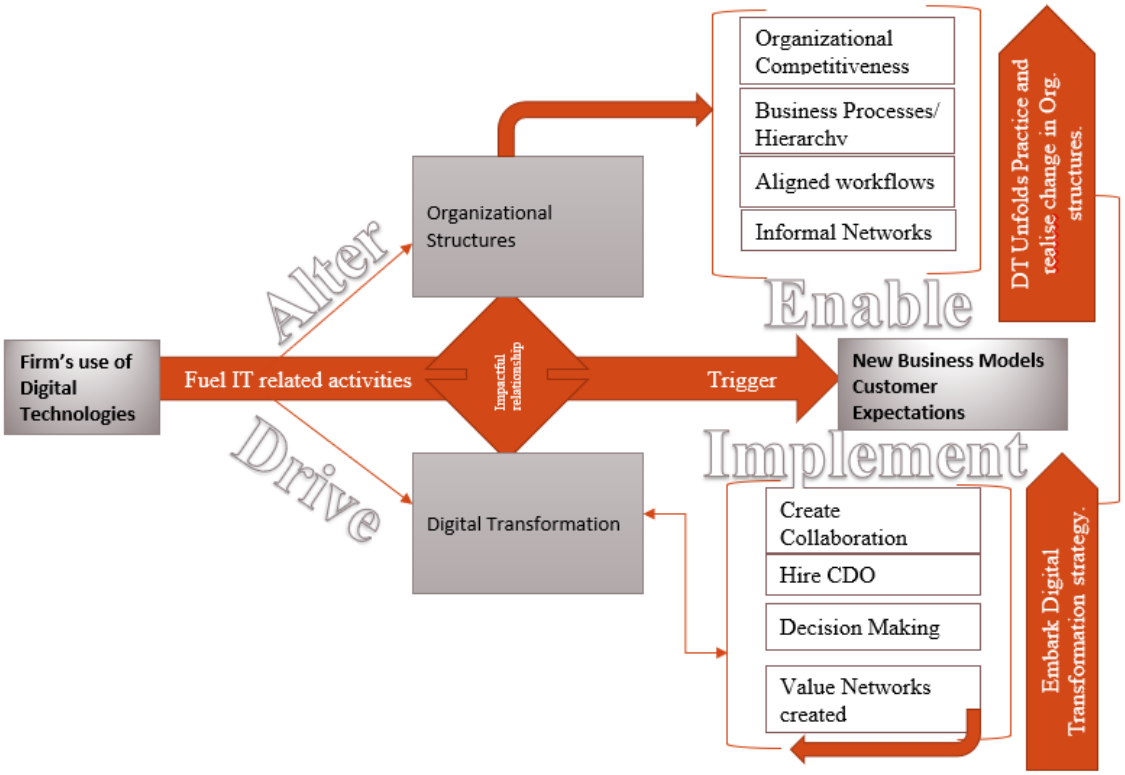
## 2.12 Theoretical framework

### 2.12.1 Digital transformation framework

The theoretical framework chosen is from Vial (2019), as illustrated in Figure 1, which theorises the relationships or causalities forming during digital transformation and answers the research question of how digital transformation impacts organisational structure. The theoretical framework drawn from the literature review also forms the basis of the research questions and sub-questions focus.

**Figure 1**

*Theoretical framework digital transformation*




*Note*. Adopted from Vial (2019).

According to Vial (2019), the digital transformation framework is an inductive framework and the introduction of technologies in some areas of a business creates disruptions that impact the nature of the business. The research undertakes to explore how digital transformation impacts organisational structure.

Specific technology which is introduced over time changes how individuals work in the organisation (Singh et al., 2020). It also impacts how the organisation provides services to its customers and over a period forces the organisation to consider a wider digital transformation process and therefore also consider strategic changes to capture value (Feliciano-Cestero et al., 2023; Keen & Williams, 2013). With the introduction of these digital technologies, disruptions within the organisation and the external market take place (Kraus et al., 2022). These results or triggers influence the change in digital business strategy which creates value paths and in turn, creates wider structural changes of which a key one is the change in organisational structures. The change in structure necessitate business process reviews and workflows which enable business to balance controls and efficiencies within the structures to realise value which further

enables innovation and cross-functional coordination or cooperation among different functions which ultimately impacts organisational structures (Loonam et al., 2018). DT transformation further creates empowerment to employees to have autonomy in terms of their duties and tasks they perform with less control from a hierarchical perspective especially technical and operational roles, which lessen the bureaucratic nature observed from traditional structures.

## 2.13 Conclusion

This chapter discussed how the research focused on the gap proposed by researchers, namely to understand how digital transformation leads to organisational structural changes and what factors necessitates this shifts in organisational structures. According to Hanelt et al. (2021), academic scholars agree that digital transformation creates value paths for organisations in that they can better serve their customers through improvement in workplace and business processes (Vial, 2019). Equally, however, scholars have called for an empirical understanding of how digital transformation leads to organisational structure changes and how cross-functional structures enable digitalisation. The research further considered the extent to which digital transformation can be adopted into organisations effectively by investigating leadership decisions on organisational structures and workplace arrangements, including the hiring of a CDO to effectively support the transformation (Singh et al., 2020). The chapter further discussed how these structures enable DT and therefore add to the deeper theoretical conception of this phenomenon (Hanelt et al., 2021).

The chapter has also provided a better understanding of why some organisations are slow in adopting and embedding digital transformation, as it is determined from the Vial (2019) definition of DT as, “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies” (2019, p. 9), which answers the gap as identified by academic scholars. Digital transformation impacts organisational structure changes (Nazari & Musilek, 2023; Singh et al., 2020; Verhoef et al., 2021). It also requires CDOs to facilitate the adoption of DT (Singh et al., 2020). The CDO is specifically required to maintain the link between top management teams and nurture the engagement. This role further has a responsibility to empower employees across the organisation on expanding their learning about digital concepts as this knowledge mitigates the challenges experienced by employees during the process of digital transformation.

Thus, the role of the CDO influences the adoption of DT at different unit levels and at different hierarchal levels which illustrates the impact of digital transformation on organisational structure. It further ensures that the informal and formal setup experiences during DT is aligned in positioning the task carried out and the strategies that are followed, impacting roles and creating new roles (Hanelt et al., 2021; Singh et al., 2020).

As highlighted in the literature review above, an organisation needs to change and align its structure to the digital transformation strategy for successful implementation (Samimi et al., 2022; Singh et al., 2020). According to the literature, due to the shift in workflows and business process necessitated through the introduction of DT, employee roles and skills change, and consequently organisational structural changes and traditional structures do not enable innovation and employee taking ownership and responsibility (Vu & Hartley, 2022).

The next section presents the research question that this study designed and which is supported by the literature review.

# CHAPTER 3: RESEARCH QUESTIONS

## 3.1 Introduction

According to Hanelt et al. (2021), academic scholars agree that digital transformation creates value paths for organisations (Vial, 2019). However, scholars have called for the understanding of how digital transformation leads to organisational structure changes and how cross-functional structures enable digitalisation.

The research aimed to consider the extent to which digital transformation can be adopted into organisations effectively by understanding leadership decisions on organisational structures to support digital transformation what factors necessitates the changes (Singh et al., 2020).

The research further aimed to understand how these structures enable the digital transformation journey and therefore add to the deeper theoretical conception of this phenomenon (Hanelt et al., 2021). The primary research question sought to answer how digital transformation impacts organisational structure and was derived from the research problem, guided through the literature review presented in Chapter 2.

Further research sub-questions were developed to understand and to dig deeper in the factors necessitating and exploring how digital transformation impacts organisational structures in the Namibian electricity supply industry.

## 3.2 Research questions

The main research question of the study was:

How does digital transformation impact organisational structure?

In addition, the research sought to answer the following sub-questions:

RQ1: How do organisations align their structure for a digital transformation journey?

RQ2: What is the impact on organisational structure post the digital implementation journey?

RQ3: How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey?

RQ4: How does the business create and enable self-organising teams that are important for the realisation of digital transformation?”

A draft questionnaire adopted from future research areas as indicated by scholars is attached as Annexure 3.

The next chapter covers the methodology of the study, which was conducted to address digital transformation, organisational structures, and how digital transformation impacts organisational structures.

The methodology further provides an academic perspective on the digital transformation in the electricity industry with a specific focus on Namibia.

# CHAPTER 4: METHODOLOGY

## 4.1 Introduction

According to Hanelt et al. (2021), academic scholars agree that digital transformation creates value paths for organisations (Vial, 2019). Equally, however, scholars have called for the understanding of how digital transformation leads to organisational structure changes and how cross-functional structures enable digitalisation.

The research aimed to consider the extent to which digital transformation can be adopted into organisations effectively by understanding leadership decisions on organisational structures to support digital transformation (Singh et al., 2020).

The research further aimed to understand how these structures enable the digital transformation journey and therefore add to the deeper theoretical conception of this phenomenon (Hanelt et al., 2021). The primary research question sought to answer how digital transformation impacts organisational structure.

In order to understand how digital transformation impacts organisational structures in the Namibian electricity supply industry, a qualitative research approach was adopted. The approach was chosen to aid the study by drawing meaningful views from participants' perceptions (Gehman et al., 2018). Qualitative research is valuable as it aims to consider experiences and perspective of respondents (Rahman, 2016). It further offers inductive insight into how digital transformation impacts organisational structures in the Namibian electricity supply industry. Thus, providing an understanding from the experience of the research participants (Bell et al., 2019).

## 4.2 Research paradigm

According to Bell, Bryman, and Harley (2019), it is critical to understand the different paradigms involved in social research to get the methodology of the research correct. The authors suggest fundamental assumptions underpinning the academic research undertaken. It is necessary to clarify methods to fit the assumptions and therefore fit a suitable way of asking the questions. Bell et al. (2019) indicate two paradigms that must be understood to validate our objective for our methodology.

The first of these is the ontology paradigm, which refers to the nature of social phenomena or reality (what is reality). And the second is the epistemology paradigm, which refers to what we know about reality. As the authors indicate, "we can design research studies which are most effective in capturing the reality, and the Epistemological

consideration which is the understanding of the nature of reality how we know what is known" (Bell et al., 2019, p. 72).

### 4.3 Research approach

The qualitative research approach was chosen as the methodology to conduct the research. Qualitative research is valuable as it aims to consider experiences and perspective of respondents (Rahman, 2016). The method offers inductive insight and understanding from the experience of the research participants (Bell et al., 2019).

This is in line with Flick's (2014) narrative suggesting that qualitative research provides significance subjective experienced insights into the various contexts – including the social interactions, and scenarios from the participants' perspective. Therefore, qualitative research further aids in the understanding of the study. It does so by extracting meaning on the nature, strengths, and interactions of different variables within different environments based on the research questions (Hair et al., 2020).

The research study aimed to understand how digital transformation impacts organisational structure pre-implementation, during implementation and post implementation. In addition, the research sought to identify how different structures including self-organising teams enable digital transformation (Bharadwaj, El Sawy, et al., 2013a). And how to balance controls and efficiencies within existing structures to realise value from the digital transformation journey (Verhoef et al., 2021). Therefore, the method chosen was most suitable as it enabled the researcher to attribute meaning to events, from the lived experiences of participants and their environments, of how digital strategy impact organisational structure (Williams, 2007).

The approach further allowed the researcher to have a deeper exploration and investigation of the participant responses, providing rich contextual understanding (Bell et al., 2019; Gehman et al., 2018; Rahman, 2016). And thereby exploring and inductively drawing meaning from the perspective of participants, which included understanding the complex social realities of how digital transformation impacts changes in organisational structures. This allowed the researcher to contextualise and reflect on what type of organisational structures support digital transformation (Bell et al., 2019; Farjoun et al., 2015).

## 4.4 Population and or research setting

According to Saunders and Lewis (2017), the term "population" refers to an inclusive collection of individuals, institutions, or geographic areas that share a common set of characteristics.

The population for this study comprised executives and individuals who work in top management teams and were involved in strategy formulation in the energy industry of Namibia. The Namibian energy industry comprises energy institutions organised into downstream liquid fuels, electricity subsectors, as well as an upstream oil and gas subsector and the renewable energy sector (Von Oertzen, 2019).

The population was chosen because these individuals are members of the top management teams implementing digital transformation or putting digital transformation strategies in place.

The population also comprised a diverse variety of participants from the energy sector involved in strategic decision-making. These individuals have professional knowledge, expertise, or competence in strategy formulation and implementation for digital transformation (Williams, 2007).

The research looked at understanding how digital transformation impacts organisational structures; and whether existing structures need to be changed to support the digital transformation journey and how this affects hierarchical levels. The energy industry is lagging behind worldwide digital trends that have moved faster than industry acceptance (Vu & Hartley, 2022a; Wang et al., 2022). And it was found necessary to transition from old structures that are not suited to digital transformation to structures that allow for an adaptive digital transformation journey (Verhoef et al., 2021). The characteristics shared by this group provided useful information in answering the research questions (Bell et al., 2019; Nazari & Musilek, 2023; Rozite & Kamiya, 2022; Saunders & Lewis, 2017).

The population for this study was crucial in ensuring that the method of the research remained consistent with the research questions and enabled meaningful thematic themes relating to the research questions (Bell et al., 2019). Hence, participants were required to understand digital change in the energy industry to answer interview questions.

## 4.5 Unit and level of analysis

The unit and level of analysis refers to the narrowed subset targets that form the subject of measurement based on the unique characteristics of the population (Bell et al., 2019; Bhattacherjee, 2012; Williams, 2007).

The level of analysis was the executive level in the organisation and the unit of analysis was the individual executives chosen to participate. This ranged from top management, including heads of information technology, digitalisation, and or data structures (HICT). They were within the electricity supply industry and served or occupied the mentioned roles, and not a company. This unit of analysis implied who and what analysis and conclusions were drawn from the level and unit (Sedgwick, 2014).

## 4.6 Sampling method

A sample is a subset of individuals that is chosen from a larger population. Sampling is the deliberate selection of a certain group from which data will be collected for the purpose of conducting research (Bell et al., 2019; Mouton & Babbie, 2001).

It was impossible to sample the entire population given the time in which the research had to be completed. The unit was further selected as a representation of specific characteristics for purposive sampling, required for the subject matter. Finally, the unit of analysis selected comprised individuals involved in making decisions on organisational structure strategies, were driving or were planning to go through, and or have gone through the digital transformation processes (Cosh et al., 2012; Hair et al., 2020; Lunenburg, 2012; Samimi et al., 2022).

The participants were selected from the population within the network of professionals working in the electricity supply industry (Nusbaum et al., 2017). These were accessed through the researcher's professional network via LinkedIn and through the researcher's personal profession network built through industry experience. Access to participants is further elaborated in Sections 4.6.2 and 4.6.3 under purposive sampling and sample size.

### 4.6.1 Probability and non-probability sampling

In the realm of qualitative research, the act of sampling entails the application of either probability sampling or non-probability sampling methodologies (Bell et al., 2019).

Probability sampling is utilised when a researcher seeks to attain generalisability to a wider community or when the research queries do not require a specific group of participants. Non-probability sampling which was the sampling method used for this study, is utilised when researchers deliberately choose not to employ random selection methods for the purpose of selecting individuals (Bell et al., 2019; Corbin & Strauss, 1998).

### 4.6.2 Purposive sampling

The importance of qualitative sampling is emphasised by Bell et al. (2019), who argue in favour of employing purposive sampling as a type of non-probability sampling. This ensures that participants are chosen selectively to provide insightful responses based on their expertise and comprehension of the subject matter (Eisenhardt, 2021).

Purposeful sampling also means that a criterion is set and is subjectively chosen in order to answer the research question. In this research, respondents were selected through a purposive process through the electricity industry professional network. This ensured that participants carry the attributes required to fit the purpose of the study (Williams, 2007).

The energy sector of Namibia has many different actors listed as: oil and gas, hydrogen, electricity generation, transmission, and distribution, independent power producers, the mines and energy ministry, and the regulators.

As a result, the sampling method for the research was limited to a non-probability purposive sample of executives, top management, and HICT within the electricity industry. They were sourced through a professional network via LinkedIn and via the researcher's personal professional network built through industry experience. This group of people were believed to have subjective, meaningful insights that provided answers to the research question and that spoke to the electricity supply industry (Mouton & Babbie, 2001). The purposive sampling method was crucial in ensuring that the method of the research remained consistent with the research questions and enabled meaningful thematic themes relating to the research questions (Bell et al., 2019).

The individuals formed part of strategic decision-making in their respective companies and were either involved in digital transformation strategies or were driving digital transformation within their companies. The sample group had expertise or knowledge relating to the area of research (Bell et al., 2019).

The primary advantage for the purposive approach was aimed at participants providing meaningful insights and eventually answering the research questions (Bell et al., 2019).

The inclusion of participants was from various sectors within the electrical industry, such as transmission, distribution, generation, and renewables. This enabled the researcher to gain comprehensive insights into the experiences of the participants with diverse viewpoints. This approach, however, potentially also revealed conflicting interests among the participants given the varied backgrounds in terms of triangulation (Gehman et al., 2018). Access to participants is further elaborated on next.

### 4.6.3 Sampling size

When doing qualitative research, in particular through the use of purposive sampling, one factor that had to be considered was the saturation of the interviews conducted (Bell et al., 2019; Corbin & Strauss, 1998; Mouton & Babbie, 2001).

Various authors suggest different sample sizes for qualitative research but taking into consideration saturation and information redundancy (Hennink & Kaiser, 2022). Bell et al. (2019) posit that saturation is reached when new data does not give any new insights when more participants are interviewed. This is supported by Gehman, Glaser, Eisenhardt, Gioia, Langley and Corley (2018) suggesting that researchers must ensure sample sizes are large enough or small enough to avoid problems with data saturation, theoretical saturation, or information redundancy. Hennink and Kaiser (2022) concluded in their recent study that saturation is reached in the range of 9 to 17 participants for purposive sampling. This closely aligns to the saturation rate suggested by Guest, Namey and Chen (2020) who recommended saturation to fall between the range of 11 to 17.

The sample size of this research was determined through purposive sampling and response rates of 60% with a target saturation of 13 interviews, while ensuring rigour in answering the research question. The sample size was 20 and researcher conducted 13 interviews with participants from different electricity supply industry players.

The size considered further took into cognisance the GIBS guidelines for a qualitative sample size under the research methods class [between 12 – 20] (Bell et al., 2019). More than 20 participants were to be considered if the relevant insights required did not come out clearly to build thematic and deeper insight (Williams, 2007).

The electricity supply industry consists of more than 15 different organisations spread across electricity generation, transmission, distribution, and renewable electricity. The

consideration was to interview individuals from about four to 10 of these organisations within the electricity industry. The response to the interview was a challenge, especially in getting the participants to comply with the schedules set, as most of them kept changing the dates. A qualitative purposive response rate is considered to be between 50% – 90% (Guest et al., 2020; Hennink & Kaiser, 2022). Thus, the sample size considered took cognisance of the response rate of at least 60% (minimum 12).

The response rate of 60% was based on the below assumptions, taking saturation into account:

a) The electricity industry has more than 15 industry players;

b) The researcher needs to interview at least two participants from about 10 industry players;

c) It adds up to a minimum of about 20 participants;

d) Thus 12/20 provides a response rate of 60% of which guidance on saturation is reached (Guest et al., 2020; Hennink & Kaiser, 2022)

e) And if all 15/20 participants participate, it provides a 75% saturation rate. The 13 participants provided a saturation rate of 65%.

As previously mentioned, access to participants was gained using the researcher's professional network on LinkedIn and the researcher’s personal network established through industry experience over the years. Some of the participants were LinkedIn colleagues and some were participants with whom the researcher interacted and is still interacting on the energy industry business forums. The researcher has built connections through interactions with some of the participants before. Despite the researcher's familiarity with the majority of the identified participants from their involvement in the electricity industry business forums and interactions, the contact information of most participants was publicly available due to their active participation in the electricity and industry forums.

Finally, when the researcher started this journey, she reached out to individuals considered to form part of the research journey. These individuals provided their contact details willingly.

Thus, a varied number of executives from each organisation were picked whose responsibility involved making decisions on organisational structure strategies, or were

driving, were preparing to go through, and or have gone through a digital transformation process.

These individuals met the required characteristics as required under the unit of analysis in the sample method above and were able to answer the research questions (Rahman, 2016). To ensure varied and differentiated responses, the individuals were selected from the various organisations within the electricity supply industry (Bell et al., 2019; Eisenhardt, 2021; Mouton & Babbie, 2001).

### 4.7 Research instrument

Bell et al. (2019) and Eisenhardt (2021) emphasise the significance of interviews as the predominant tools employed in qualitative research. The authors argue that while there are different methods of conducting interviews, semi-structured interviews offer greater flexibility and enable deeper exploration of themes. This approach allows for variations in the order of asking questions and also allows for further probing, considering the diverse nature and experiences of the participants (Mouton & Babbie, 2001).

For the purpose of this research, an open-ended, semi-structured but not leading interview guide was developed and grounded on the literature review and research questions (Eisenhardt, 2021). The questions were developed from prior research done by Singh, Klarner, and Hess (2020) and aligned to the different constructs from the literature review to address and explore the research questions (Bell et al., 2019; Hair et al., 2020).

The interview guide was pilot tested to verify the exploratory nature of the questions, specifically on the different constructs and variables (Flick, 2014). The pilot test further ensured that any shortcomings were addressed so as to ensure quality and reliable data gathering and building of themes.

Also, unless determining the criteria and characteristics required from participants, the interview guide ensured that the questions were not open ended. And at instances, captured the necessary characterisation required for meeting criteria for being interviewed and keeping an audit trail on the interviews (Corbin & Strauss, 1998; Mouton & Babbie, 2001). The criteria for meeting the requirement were noted separately with participants prior to the interview.

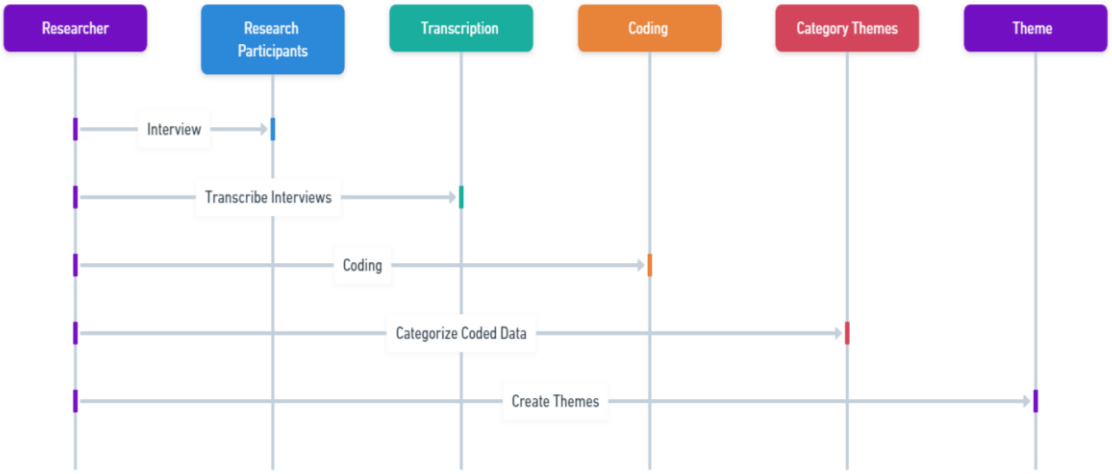
A copy of the questionnaire is attached as Annexure 3, including the Annexure 1 consistency matrix. The questionnaire also had subset of questions to cover the drivers,

challenges, and or outcomes. The sub-questions helped to structure and assemble the type of data and themes required to answer the research question (Bell et al., 2019).

## 4.8 Thematic analysis

**Figure 2**

*Analytical approach and steps used for data gathered*




*Note*. Authors own using

Ground theory suggests that it is important to detect and analyse patterns within qualitative data to capture the rigour in analysing data (Bell et al., 2019). This is classified in four stages by Clarke and Braun (2013), Which are: familiarisation with the data, coding, generating initial themes and reviewing themes by conducting back-and-forth reviews. This was done by replaying audio recording and interpreting and writing up the meaningful insights under different themes. Figure 2 is an example of the steps followed.

All interviews were conducted online interviewing with 13 participants in which each interview was between 45minutes to an hour, the longest interview was just over an hour and 20minutes. MS team audio were made, the researcher also made summaries on key insights to start the labelling process for the codes. However, when transcripts were downloaded researcher had to merge and summaries made and rework all transcripts, by listening to audios which also allowed better familiarisation with the information, by the third transcript the researcher started building the relationships on the data. The coding process was then started and done by replaying audio interpreting and writing up the meaningful insights under different responses, creating code subcategories and then the themes, and then sub categories for the themes.

The amount of data was further reduced for testing the relationships between participants, and finding ways to present the results effectively (Bell et al., 2019). Data analysis that was conducted ensured that there was reliable data to produce reflective inductive themes developed from the words of the participants without bias and also to be able to identify limitations (Flick, 2014; Wolfswinkel et al., 2013).

### 4.9 Research Quality, rigour, reliability, and validity

The research process is rigorous, and is required to ensure research questions are linked to the literature review and the design of the interview protocol is developed to answer the research question (Bell et al., 2019). This required good understanding and clarity of research and having the right constructs to produce an academic research result and reliable data gathering and produce quality research. According to Bell (2019), although reliability and validity are separately defined in research, they are related because validity defines reliability. This means that if the research method is not valid it is presumed not reliable.

The consistency matrix was applied (as in Annexure 1) to ensure that the right constructs are aligned with the literature covered to provide research quality. Sub-questions as covered in the literature review formed part of the questionnaire to provide further insight in how digital transformation impact organisational structure.

Validity refers to the accuracy and appropriateness of the measurements used to assess the characteristics, while reliability pertains to the consistency and stability of those measurements, for example, can the results of the study be triangulated and produced truthfully from the words and perspectives used by the participants? (Bell et al., 2019; Williams, 2007). Clarke and Braun (2013) suggest that methodical and inductive processes must be established. This is for the purpose of identifying and examining themes derived from textual data that can be validated with the participants' words (Clarke & Braun, 2013). For this study, the data was accurately processed, and information captured during interviews was validated against the information in the audio recording and verbatim transcripts was done by the researcher as interviews were conducted online via Ms Teams.

The development of themes and coding was validated with Atlas.it software and at least two rounds of validation took place (Clarke & Braun, 2013; Nusbaum et al., 2017).

## 4.10 Ethical consideration

Due to the nature of qualitative research where semi-structured interviews were held and participants were mostly known, confidentially was critical and had to be maintained. The research process followed an ethical and moral guideline that the researcher had put in place and specific principles were followed to protect the privacy and identity of participants (Bell et al., 2019; Corbin & Strauss, 1998). The interview guide was structured for ethical consideration. The researcher was mindful of not asking factual identifying information and the instances where this was asked the information was used for the purpose of ensuring the individual interviewed met the criteria to be interviewed (Williams, 2007). The related information of participants was anonymised to protect participants' identity (Flick, 2014). The data is stored on an external hard drive in a safe for a period of 10 years.

The ethical issues considered, which formed part of the interview process, are presented in the next section.

### 4.10.1 Informed consent

An informed consent letter was critical to the ethical process and Josselson (2013) suggests that the interview process should not be started before the informed consent is signed and agreed upon. This was carried out by primarily ascertaining that those participants possess comprehensive understanding of the interview conditions. The consent form also addressed and spelled out any ethical or moral concerns that may arise throughout the course of the interview (Bell et al., 2019). All participants were asked to reconfirm the consent form before the recorder was played during each interview.

The study conducted by Nusbaum, Douglas, Damus, Paasche-Orlow, and Estrella-Luna (2017) highlights the significance of informed consent within the context of qualitative research, especially regarding confidentiality. The consent form for the sake of this research involved ensuring that participants possess a comprehensive awareness of the research objectives. Participants confirmed to willingly engage in the interview process, while also being aware of the potential disadvantages associated with their participation. Nevertheless, the researcher did emphasise that the decision to participate and assume any associated risks lies solely with the participant. However, before the interview process the researcher invited questions, and discussed and provided explanations of any potential risks involved or no risk.

For this research, the interviewer ensured that the informed consent was signed and agreed upon by each interviewee before the actual interview commenced. Because an audio recording was utilised for these interviews, to ensure rigidity and rigour, the participants were informed why the recording was required and any concerns were discussed and clarified. The transcription of the interview was done but by the researcher and validated for quality with the audio recordings more than 2 times. No financial benefits were provided to participants. Annexure 3 further provides the copy of the informed consent.

### 4.11 Limitations

The study was purposively sampled in terms of those eligible to participate and not. This might have created subjectivity as an inherent nature of qualitative research (Bhattacherjee, 2012).

Because the interviewer was not a qualified qualitative researcher, the approach and nature in which the interviews were conducted carry some limitation on the outcome and some of the generated responses depending on how the interviewer asked the questions or probed the questions, or even conceptualised the words (Josselson, 2013; Wolfswinkel et al., 2013).

Despite conducting a pilot interview, the researcher found it necessary to reiterate certain questions during the interviews. However, as the interview progressed, modification was done for some of the questions that the original participants had asked me to repeat. In addition, certain participants engaged in excessive talking, prompting the researcher to learn from participant number 7 that in the future, researchers should urge them to adapt and redirect their attention towards the posed subject. Additionally, the researcher occasionally had to rephrase certain questions due to participants' failure to respond, although this also served as a valuable learning experience and notably prolonged the interview. To correct this in future a more comprehensive guide and sharing the interview guide prior to actual section may be a corrective or preventative measure to ensure quality responses. Although theory also position that there may be a loss of spontaneity in sharing the interview guide (Bell et al., 2019).

The electricity industry in Namibia digital maturity acumen is behind in terms of experience compared to the global digital transformation maturity levels (Vu & Hartley, 2022).

Perceptions of participants were lagging in terms of the digital trends; therefore, the responses are limited to the contextual environment of the Namibia electricity supply industry and may not be generalised or transferred to other contexts (Bell et al., 2019; Mouton & Babbie, 2001).

# CHAPTER 5: RESEARCH FINDINGS

## 5.1 Introduction

The study explored how digital transformations impact organisational structures in the Namibian electricity industry. This chapter presents the findings of the research conducted based on the methodology plan and techniques explained in Chapter 4. A total number of 13 research participants were interviewed individually via an online platform using a semi-structured research questionnaire to answer the research questions provided in Chapter 3; which primarily looks at how digital transformation impacts organisational structure. The research participants were purposefully selected and ranged from a diverse group of top executives within the Namibian electricity industry focusing on generation, transmission, and distribution.

The first part of the chapter begins with an overview of the research participants. The chapter continues with an overview on the coding process followed and ends with different results presentation sections structured according to the theoretical themes and categories established during the coding analysis generated from the interviews.

## 5.2 Grouping of research participants

Thirteen participants from the electricity industry were interviewed as per Table 1 which presents the demographic data of the participants such as their profile, job level, organisation type. The designations Top Management CEO (TMC), Top Management Executive Management (TMEM), and Top Management Senior Management (TMSM) (were created to accommodate organisational structures where positions were titled Senior Management or Manager, instead of Executive Management), but nonetheless report directly to the CEO on the organogram.

The purpose of introducing these grouping was to provide clarity and consistency as the participants had different top management structures from their respective organisations. Thus, Top Management was used to explain that these positions are part of the highest level of management within the company.

The participants were further categorised into three professional groups based on their professional expertise level for a more detailed study and perspectives this was done to indicate the different views and topical issues on which some participants were vocal or passionate about, given the participants professional focus. This were: ICT professionals, human resources professionals and participants with technical

backgrounds (electrical engineering/renewable/ economist professionals). It must be noted that although these individuals were experts in their professional areas, they are part of top management teams, or an executive team or report directly to the CEO within an organisation in the ESI industry.

This structure was deliberate in order to comprehend the phenomenon from many perspectives and levels among the participants and will be covered under chapter 6 analysing the different groupings views and findings. A further identifier was created for the different sectors of the electricity industry which was either transmission, generation or distribution. This was necessary in order to draw insights on the different responses of digital transformation and its impact on organisational structures given the different circumstances and contextual views of digital transformation were the participants operates.

**Table 1**

*Research participant profiles*

| # | Role | Organisation | Code | Level |
|---|---|---|---|---|
| 1 | Manager Licencing and Regulation | SLR | ECR | TMEM |
| 2 | CEO | GTT | CHA | TMC |
| 3 | GM Electrical | MED | GRB | TMEM |
| 4 | Executive Manager Network & Operations | DRN | NTM | TMEM |
| 5 | Executive Manager Human Capital | DRC | EC1 | TMEM |
| 6 | CEO | GTT | CTA | TMEM |
| 7 | Executive Manager Technical &Ops | DRO | ETO | TMC |
| 8 | Executive Management ICT | DRC | EC2 | TMEM |
| 9 | Manager ICT | OXG | SNI | TMEM |
| 10 | Senior Management Technical | DGW | SW2 | TMSM |
| 11 | Executive Manager ICT & Human Capital | DRC | EC3 | TMSM |
| 12 | Acting Executive Manager Human Capital | OXG | EWH | TMEM |
| 13 | Executive Manager ICT | DGW | EW1 | TMEM |

*Note.* **Profile** = brief description of the role or title that each participant holds | **Organisation** = unique and anonymous identifier for each organisation I **Code** = unique and anonymous participant identifier. | **Level** = Top Level Management identifier (as in section 5.2). Created by author.

The participants further had purposive expertise or knowledge relating to the topic of research to provide meaningful insights in answering the research questions to understand how digital transformation impact organisational structure. And formed part of top management decision making within their respective organisations, including decisions on organisational structures with relative involvement in digital transformation.

The inclusion of participants from various sectors within the electrical industry, such as transmission, distribution, generation, was necessary to enable the researcher to gain

comprehensive insights into the experiences of the participants from diverse viewpoints, results or dominant focus areas.

This approach, however, potentially revealed conflicting interests among the participants which is addressed under the analysis chapter 6 under the different groupings.

### 5.3 Positions and level of participants

As per Table 2 below the participants interviewed formed part of strategic decision-making in their respective companies and were either involved in digital transformation strategies or were driving digital transformation within their companies. These participants further had purposive expertise or knowledge relating to the topic of research to provide meaningful insights in answering the research questions. Most of the participants had vast years of experience in the electricity industry and formed part of top management decision making within their respective organisations, including decision on organisational structures.

Below in Table 2 are the participants' profiles in terms of years of experience and in the industry.

**Table 2**

*Participant level and industry experience*

| # | Role | Expertise | Organisation | Code | Years in industry |
|---|---|---|---|---|---|
| 1 | Manager Licencing and Regulation | Technical Licencing and Regulation Tariffs | SLR | ECR | 17 |
| 2 | CEO | Independent Power Producer | GTT | CHA | 14 |
| 3 | GM Electrical | Technical Generation Distribution Technical | MED | GRB | 25 |
| 4 | Executive Manager Network & Operations | Technical Generation Distribution | DRN | NTM | 15 |
| 5 | Executive Manager Human Capital | Human Capital | DRC | EC1 | 5 |
| 6 | CEO | Technical Renewables Generation Transmission and Distribution | GTT | CTA | 19 |
| 7 | Executive Manager Technical &Ops | Technical Generation Distribution | DRO | ETO | 25 |
| 8 | Executive Management ICT | ICT | DRC | EC2 | 16 |
| 9 | Manager ICT | ICT | OXG | SNI | 15 |
| 10 | Senior Management Technical | Technical Distribution Generation and Transmission | DGW | SW2 | 12 |
| 11 | Executive Manager ICT & Human Capital | ICT and Human Capital | DRC | EC3 | 15 |
| 12 | Acting Executive Manager Human Capital | Human Capital | OXG | EWH | 13 |
| 13 | Executive Manager ICT | ICT | DGW | EWH | 10 |

*Note:* **Organisation** = unique and anonymous identifier for each organisation
l **Code** = unique and anonymous participant identifier
Created by author.

## 5.4 Coding and themes

The research analysis started after the collection of data had been finalised and coding of all transcripts had been undertaken to identify categories for the different data sets to create themes.

The themes were primarily built on the overarching research question and the sub-questions, building of the field notes and transcripts of participants. An inductive process was followed were the transcripts were read a few times and then the necessary data through the transcript was selected, and codes created in an open coding format. The field notes/transcripts data was further examined throughout the process while comparing the different responses and relationship of responses to the research questions and then categorising them into different themes to theory. The commonalities were then coded, labelled and grouped together for a category to form a relationship which was further coded into a subcategory to create a theme and sub-themes.

Initial transcript analysis revealed 374 codes from 13 participants, which were then narrowed down to 148 distinct second level codes. These codes were examined through inductive methods and grouped and categorised (through affinity) into themes based on the interview questions and linking it back to the theory. The themes in Table 3 below were created from the coding process for each sub-question, tying it back to the primary research question.

**Table 3**

*Themes and theoretical area*

| | **Primary research question:** *How does digital transformation impact organisational structure?* | | |
|---|---|---|---|
| **#** | **Sub-questions to primary research question as per interview questionnaire** | **Themes categories** | **Theme and theoretical group** |
| 1. | How do organisations align their structure for a digital transformation journey? | Role of Technologies in Digital Transformation<br>Driving Forces of Digital Transformation<br>Organisational Aspects of Digital Transformation | Digital Technologies as a Driver of Digital Transformation |
| 2. | What is the impact on organisational structure from the digital implementation journey? | Structural Changes<br>Adaptability and responsiveness<br>Collaboration and Integration<br>Skill Requirements and skill organising | Digital transformation and Organisational Structures |
| 3. | How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey? | Controls and Process Flow<br>Operational Instructions and Efficiencies<br>Response Time and Fault Finding | Process Optimisation and Efficiency |
| 4. | How does the business create and enable self-organizing teams that are important for the realisation of digital transformation? | Addressing employee beliefs and perceptions<br>Team autonomy and empowerment<br>Ownership and Accountability | Empowering self-organising teams for successful digital transformation |

*Note*: Table created by author.

The research primary research question looked at how digital transformation impacts organisational structure. During the coding process the second level coding process for

each sub-question was conducted to ensure they tie back to the primary research question. This provided a deeper understanding and answering the primary research question. Code groups sharing similarities were connected to theoretical themes, which for some led to the emergence of new themes during the interview analysis (this is covered under the summary section).

The literature review, Chapter 2, concluded with a theoretical framework supporting the theoretical foundations of the study and interview questions design. This was also used to guide the coding, themes and the categories ultimately setting and aligning the sections in Chapter 5 to present the results.

Table 4 illustrates the research question concepts associated with the study issue, which are tied to the second level code groups and aligned to the research questions and sub-questions. New themes further emerged such as new business model emergence and the role of leadership in driving DT – these were worked back and tied back to the theories in Chapter 2.

**Table 4**

*Themes and categories per RQ*

| # | Sub-questions to primary research question as per interview questionnaire | Themes subcategories |
|---|---|---|
| 1. | How do organisations align their structure for a digital transformation journey?<br><br>**Theme:** Digital Technology as a Driver of Digital Transformation | Role of Technologies in Digital Transformation<br>Driving Forces of Digital Transformation<br>Organisational Aspects of Digital Transformation |
| 2. | What is the impact on organisational structure during/post the digital implementation journey?<br><br>**Theme:** Digital transformation and Organisational Structures | Structural Changes<br>Adaptability and responsiveness<br>Collaboration and Integration<br>Skill Requirements and skill reorganising |
| 3. | How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey?<br><br>**Theme:** Process Optimisation and Efficiency | Controls and Process Flow<br>Operational Instructions and Efficiencies<br>Response Time and Fault Finding |
| 4. | How does the business create and enable self-organizing teams that are important for the realisation of digital transformation?<br><br>**Theme:** Empowering self-organizing teams for successful digital transformation | Addressing employee beliefs and perceptions<br>Team autonomy and empowerment: Lean Structures<br>Ownership and Accountability |

*Note*: Table created by author.

Each theme is introduced, and the various categories related to the theme are discussed. Each discovery related to this topic is presented, followed by a conclusion. Each theme is presented with its own section containing the overall findings and conclusions. A final conclusion is then drawn based on the overall findings of Chapter 5.

Where necessary, the data was further segmented based on participants groupings. Key responses were presented, with quotes from participants to support the finding. The data was reviewed iteratively until all themes were addressed, with additional themes supporting or disqualifying theoretical themes (to be discussed in chapter 6). The layout was repeated for all themes.

## 5.5 Research questions and findings

Primary research question: How does digital transformation impact organisational structure?

### 5.5.1 Digital technologies as a driver of digital transformation

RSQ1: How do organisations align their structure for a digital transformation journey?

The theme drawn under this RSQ1 is digital technologies as a driver of digital transformation. The theme lays the foundation of the interplay between the introduction of digital technologies as a driver for digital transformation and consequently influences and shapes the direction of the operation within organisations. It further brings out the role of ICT. The theme further provides findings on how digital technologies align and necessitate the integration of various tools, systems, and platforms that enable digital transformation. Participants provided insights and perspective on how the organisations within the industry align themselves from a strategic, structural and people management perspective with the introduction of digital technologies. The theme also provided a perspective on answering the driving forces of digital transformation, such as the technology as mentioned earlier, the need in terms of creating customers value, productivity improvement including the changes taking place within the electricity industry, and the need for innovation to gain competitive advantage.

The theme further covers the organisational aspects of digital transformation having a focus on the people-orientated challenges in digital transformation which include the alignment journey, change management, leadership, dynamic capabilities, agility, flexibility, strategic planning, digital mindset, technology uptake, and organisational context. These dynamics at play shape and affect the hierarchical structure and decision-making processes within organisations due to technology driving the need for digital

transformation and eventually necessitating an impact on organisational structures. The subcategories formed for this theme are (the role of technology in digital transformation, driving forces of digital transformation and organisational aspects of digital transformation. Each theme subcategory findings is presented as separation sections below.

*5.5.1.1 Role of technology in digital transformation*

All participants unanimously acknowledged that the introduction of digital technologies had a significant impact on organisational and industry digital transformation. Participants further agreed that technologies facilitate and accelerates digital transformation for the respective organisations. Participants also agreed that this required comprehending the strategic implementation and blending of different technologies including automation, developing digital tools and for some (artificial intelligence) and data analytics. As some participants commented:

> *"There was a number of reasons of digital technologies triggering digital transformation, we find that the industry development, and our peers doing it (Competitors marketing their business and industry related peer pressure in using this technologies). And noticed that if we do not do it, we will be left behind. Another trigger was looking at a way to improve efficiency and accessibility, by addressing this we had to adopt some sort of digitalization" (ECR)*

> *"So, it's using these technologies to really change how we do business. So, the digital transformation therefore is moving from the way of doing business when introducing technologies in some areas, to utilising digital tools to do business" (CHA)*

> *"We wanted to look at how to automate processes. So, we implemented an intensive project to automate the whole organisation. We were looking at a process to automate the whole sales process we called it sales information initiative which was traditionally a manual process. So, we wanted to see how we can take the manual process and run an automated digitalize process from when a client walks-in to the engagement and a few consulting" (EC1)*

> *"We do have a drive towards technological innovation. Some of our traditional deliverables in terms of our scorecard were still manual, especially the operational process. Our procurement and payment processes are run through the SAP systems and basically most of the operational processes are in place"*

*SAP, currently is just an operating system, and we have different operating systems. We are currently looking at modules and aligning the system to our entire business environment" (EC1)*

#### *5.5.1.2 Drivers of digital transformation*

A number of participants also agreed on the key drivers that push organisations towards embarking on a digital transformation journey. They repeatedly mentioned factors such as the need to stay competitive, responses to industry changes, and meeting of customer demands, driving innovation, and enhancing productivity across the experts' groups. Participant EW1 in particular iterated:

*"Last year we did a study on internal applications were we defined internal architect. Defined data duplication and wastages. This led us to the point were when dealing with a customer we had to create a single source of data, irrespective of what source of data is created the infrastructure became the basis for the data transformation whatever application, it will be placed in one platform to minimise the data source from which the data is being sourced"*

*"What we then did was look at the automatic metre reading system where we tried to cut down on some of the manual processes that needed to happen and identified within that chain what has to kind of move from manual mechanical or electronic to digital and automating" (CTA)*

*"The organisation valued technology and looked at technological innovation as part the overall organisation strategy and it was incorporated in the strategy. As part of the strategy, we had to innovate and had to come up with some technological innovation at least (at least one) for every department each year which had to run across the organisation" (EC2)*

Participant EC2 further mentioned the following:

*"Sometimes we used to have a problem with applications getting lost and when customer follow up and try to trace who's having the application. You will find that colleagues pointed finger to each other, and the application sometimes could not be found"*

*So, we had to automate that process so that once a customer apply, the application is captured on the system, then the process moves to works flows*

*from one individual to the next, or the next individual at any given time and from department to department"*

*"You can trace that application and see who is busy working on it. You can also trace how long each person has worked on the application whoever it is one could see who has a backlog and so forth just by going on the system or a device. One could also determine what the problem is, why it is maybe hanging" (EC2))*

Participant GBR defined digital transformation from a digitalisation perspective:

*"Digitalisation has its background from a number of years back in the sense that big industries have moved away from basic manual systems to sort of automated systems that is connected to digital system being in the PLC or scalar system where you have all that you start and stop operations outside" (GRB)*

One participant (CTA) mentioned the wider need to drive business efficiency through integrating the entire business perspective. The participant defined digital transformation from a business-wide integrated way of doing things digitally, and commented:

*"What we did find is that the capturing of some of those different processes from a digital transformation was to train and optimise the candidates or people that work in it, and that's ultimately where digital transformation comes in way of digitalisation. Where you have systems and then you need to have people and where people have to emerge into a business process to ultimately get to an efficiently run systems, so our organisation is striving to make use of technologies constantly to enhance the better customer satisfaction or experience for our clients" (CTA)*

This perspective and views flow into the next theme of organisational aspect as elaborated in the next section.

*5.5.1.3 Organisational aspects of digital transformation*

The organisational aspects of DT brought it down to the challenges of DT, especially the people and organisation aspects, with digital transformation, and the drive for it required leadership to not only have a digital mindset but to also take into consideration the readiness of employees for digital transformation and to ensure the dynamic capabilities of leadership to drive digital transformation. This provided a link of digital transformation impacting organisation structures through the process of change management and the

people side of things as the introduction of the digitalised space impacts roles and jobs and ways of doing things. Participants commented:

> *"But what would be needed is skills, definitely the right leadership skills, because the leadership drives digital transformation. I mean, there must be leadership that drives digital transformation. You heard me say focus more on strategic thinking and setting the direction for a compelling digital strategy for an organisation that is #1 because from there the whole culture is then plugged in" (CHA)*

> *"You know very well from a change management perspective. As soon as you enter the realm of business process reengineering, that's where the challenges start to come into play and your ambition slowed down a bit because obviously you would need to now look at organisational aspects to look at, we have adopted the McKinsey 7S approach. You're looking at your strategy, looking at your systems, you're looking at your staff, your skills, and then also your culture as well. Hoping that everything aligns with your shared values for digital transformation I will admit it's challenging" (EWH)*

The organisational aspect also highlighted the people-orientated challenges in digital transformation and organisational components which include the alignment journey and change. These dynamics at play eventually impact the need for digital transformation which then impact organisational structures.

> *"There are some employees that will believe and immediately adopt, but you want the whole organisation to find a strategy which everyone else has bought into, so change management can be underestimated, but that's a skill needed. Yeah, for someone to drive that and manage the change we involved everyone. To see how people are reacting to it because some felt like their jobs were being taken. But with proper communication when people understand you only need to upskill them" (CHA)*

One participant placed emphasis on a digital savvy leadership which impacts organisational structure

> *"I mean the whole issue is your Leadership need to be digital savvy the CEO need to embrace and need to be digital savvy. The Boards need to embrace and be digital savvy. If they are digital savvy, they will recruit people who are also digital savvy in EXCO" (GRB)*

One key aspect that came from most participants was the role of ICT, taking into consideration how digital transformation impacts organisational structure and the need for ICT to change. All expert groups concurred with the strategic imperative of ICT needing to have a seat at an executive level and operate not just as an infrastructure provider but as a driver for strategic digital transformation, as this show how DT impacts organisational structures.

Due to the nature of their expertise the ICT professional group also had a common agreement on the role of ICT that had to be fused in the digital space, including the functionality split between information technology and the digital transformation initiatives that must be led by separate units.

> *"It has also come out in our management comments under our audits. It was a key finding which asked the same question you are asking. With the biggest risk being how Executive decisions are made in terms of digital transformation if ICT do not sit on Executive role" (EC2)*

> *"There is a digital transformation division created solely to look at digital transformation in relations to our aspiration to become a smart city. However, the ICT department is responsible to ensuring corporate communication and ensuring that the data within the Council is secured and it keeps records of all our digital files that we currently have. ICT is quite, very critical to enable the smartness of the city and provide the infrastructure development" (EW1)*

> *For example, the connectivity between the different buildings of our company is under the custodianship ICT. And ICT have personnel that are interlinking between the division of the digital transformation unit and ensure it aligns to the initiatives introduced and provide the necessary platforms (e.g., radio or fiber)" (SW2)*

Participant SN1 commented on the importance of the ICT function and also the wider business integration:

> *"In the organization ICT structure used to be on Executive level but removed from that level and then become just a function. But there is recognition at the board level to say yes functionally, but we need a for instance, cyber security to be reported on at the board level" (SN1)*

*"As long as they incorporate ICT technology in what they are implementing…But as long as the business recognized or whatever they do, they recognize the importance of that" (SN1)*

*"ICT is shifting from computation to service oriented, that means now we focus on delivering a service rather than maybe building something we've seen. We are embedded in the operation instead of looking them as separate" (SN1)*

*"There is a concept, we call it dev OPS, development and operation are together so that whatever we develop, its part of the operation and also it fit for purpose. And there is a shift in how we deliver what we need to deliver. Instead of spending first time, to look at the requirement then validating the requirement then start building and maybe by the time you spend time to build by the time you finish the technology is already redundant. We start building and testing while we wait and if it proves not possible we discard" (SN1)*

This also supports, participant EW1 who expanded further by noting that the impact of the ICT structure must be taken into context of the organisation and its digital transformation strategy.

*"None one fit structure but an effective structure depends on the context and specific environment of the business, and its digital transformation strategy objectives. In my role I had to look at aspect of ICT governance, data integration, data science, server administration, and then the support there of. So, ICT integrates at the high level of organisation. In my business unit I have a chief digitalisation officer, who implements the enterprise IT architects and this position defines how technology is going to interact with the wider business, ICT project management, ICT governance and security. This these individual drives digital transformation across the organisation" (EW1)*

*5.5.1.4 Conclusion*

This RSQ1 theme includes three key categories which are: the role of technology, the drivers of digital transformation, and the organisation aspects of digital transformation.

The role of technology in digital transformation sets a foundational basis of how the introduction of digital technologies necessitates digital transformation to influence and experience value. This includes a further finding on how the function of technology, namely ICT and digital technologies, and their integration with different tools, systems, and platforms facilitates digital transformation to integrate operational strategies.

The drivers of digital transformation were further observed from the organisation's need of trying to meet customer needs, the challenges of weak services and trying to improve service delivery, the rapid technology changes in the electricity industry, and the need to be innovative, so that with the electricity model changing, the organisations could create a competitive advantage. There was consensus among the participants for the above to be key drivers of digital transformation as a wider need to drive business efficiency through integrating the entire business perspective and processes. The participant defined digital transformation from a business-wide integrated way of doing things digitally; both from the participants and all expert groups in the electricity industry. This in turn would necessitate a change in organisational structures due to vertical changes in decision making.

The third category findings focused on how organisations adjust and align their structures and people management methods in reaction to the implementation of digital technology. This category highlighted the alignment journey, embedded in change management, leadership dynamic capabilities for technology uptake, agility, flexibility, strategic planning, digital mindset of employees and organisational context as important people-oriented problems in digital transformation which presents critical dynamics of the digital transformation impact on organisational structures. This is further elaborated in the next section.

### 5.5.2 Digital transformation and organisational structure

RSQ2: What is the impact on organisational structure during/post the digital implementation journey?

The key theme for the RSQ2 is digital transformation and organisational structures. The theme found out of this research sub-question form the basis and core of this research study and provide critical insights and findings into how digital transformation impacts organisational structures. When considering how digital transformation affects organisational structures, four categories were identified under this theme to determine how digital transformation impacts organisational structures. These were structural changes observed from digital transformation, the adaptability and responsiveness of structures as a result of digital transformation, collaboration and integration within organisational structures, and the skills requirements and reorganisation which are necessitated by digital transformation and which as a result impact organisational structure.

#### *5.5.2.1 Organisational structure changes*

The direct influence that digital transformation had on organisations and how they were structured is demonstrated by the participants' insights and perspective, highlighting digital transformation responsive changes in some organisational structures within the electricity industry. The finding under this theme answers the primary research question, elaborating how digital transformation frequently necessitated modifications to reporting lines, team structures and compositions, and hierarchal reorganisations or adjustment to make organisation structures compatible with new digital processes and technologies. But findings also show how the slow adoption in the electricity industry created inflexibility with digital transformation which then had a marginal slow impact on the hierarchal changes. This led to a slow margin of responsiveness within the Namibian electricity industry.

Not all participants experienced the same type of changes with the adoption of digital transformation, given the type of organisations that differed. Participants below elaborated:

> *"We have changed our structures to comply to the new digital transformation where we will allow certain members of our team to operate from remote ends, which was not easier before the digital world came in, particularly driven by the COVID-19 that hit all of us. So we have aligned our structures to allow for such type of environment" (SW2)*

There was a vocal agreement from all expert groups on how leadership had to consider ICT organisational structure change, as it impacted DT:

> *"From my experience, most of the utilities never really had any, for example Managers for ICT. We only started to get this ICT managers in some Companies. Right now, there's not even one ICT Executive in any of the REDS (regional electricity distributors) that I know unless. Probably company O have an executive for ICT but it's still static in the old way of the old-fashioned person and do not have a focus on digital transformation and how to drive digitization of the utilities or Industry" (NTM)*

> *"There is no specialist yet and this is the gap I see there. Yes maybe we are only starting to realise the value of digitization now and probably I think we need new structures. As the existing strategies are coming to an end. You might find new structures that might be taking digitalization a bit stronger" (NTM)*

*“We are transferring individuals to the ICT section to contribute their operational business knowledge to facilitate the transition to digitalization from other support systems such as finances and HR. The ICT department oversees this process with input from specific departmental personnel, such as HR. In my organisation, a new individual was recruited to handle digitalization within the HR department after the previous one left. There is a specific function being introduced as part of a systematic strategy to restructuring the organisation. This involves adding new roles to the structure while also educating individuals about the move from old to new practices” (GRB)*

The lack of digital/ICT experts which has an impact on marginal changes in hierarchal and traditional structures was commented on by other participants:

*“And structure need to follow the strategy and you need to support digital transformation with the right structure. But I think at the moment we are still relying on the old way of managing IT infrastructure in the IT space so. I think they still a lack willingness to deploy a digital oriented people. There might be a lack of resources as we don't have digitization experts” (NTM)*

*“As an industry due to the fact that the industry was regarded as slow in adopting digital transformation the organisational structure changes are not observed on a big margin especially not in terms of hierarchal structures or the traditional structures” (NTM)*

*“I don't think that changing drastically the hierarchy of organisations as they are, would make any difference if the management styles and leaderships are not in place or change with digital transformation” (CTA)*

*“”Electricity industry is highly hazardous you I wouldn't want to lean towards saying that there's a one size fits all there is room for a hybrid structure or actually a matrix. From a project perspective I subscribed towards a matrix approach you get innovation  you get a bit more agility and you get a bit more sharing of ideas. But from a general operation perspective talking about the electricity department and industry. I would say there is still room for a hierarchical approach, so it would have to be a hybrid between the two operations, hierarchical, project related more matrix” (EWH)*

Participant CTA commented on the electricity industry not being flexible enough for digital transformation to impact organisational structures, with new insights that there is an

impact on flexibility (due to a unionised electricity industry) which is a requirement in digital transformation. This reflects back to DT's impact on organisational structure from traditional to more adaptive and DT agile structures:

> *"On the shift from traditional structures one of the main inhibiting factors that I pick up in our whole electrical industry has strong bargain unit collective agreements. The industry has adopted a model where I employ you to do X&Y and you stay for life doing X&Y. There's not flexibility that today we can do X&Y and tomorrow we can do BNC the next day CND. Such flexibility is really lacking. We are not really into this flexible working environments were people adopt flexible working and doing pressing jobs irrespective of the time but able to relax then being fixed to the 7 to 8 working hours for life with mostly no output" (CTA)*

> *"For as long as it is like this we will struggle to evolve unless we are able to adapt and make certain duties flexible the industry will struggle to adapt to digital transformation" (CTA)*

> *"There is a big concern for in adopting technology because of high employment and employment in Namibia. And our industry is labour intensive most of our process, and we need more people to be employed as well" (SN1)*

> *"So people need to realise that is a reality. Yes, jobs will be definitely reduced. Then it's an issue that even the Union need to embrace here… we need to educate our workforce to repurpose themselves and get themselves ready for new digital employment, for new digital roles that will come up" (GRB)*

Another participant indicated the change in organisational structure being more observed in the drive for AMI's, renewables and the creation of subsidiary companies:

> *"I don't think so not at this point in time. At the moment we are obviously more driven by the renewable energy drive that's happening at the moment in the industry" (ETO)*

> *"As a company we are typically focusing our attention and our efforts, to create a new section or department in the company to actually do these renewable business components. And then we also created a new company that is actually going to run the largest solar plant when it comes online. Which must be operated and maintained, but at the moment only one employee who serves as the CEO and director of the director of that company" (ETO)*

*"Yes, we have obviously seen that AMI where we are developing metering infrastructure to make sure that even prepaid meters are no longer just prepaid but smart meters we have created the roles and have somebody who is looking at this specific project. I believe it is also the same in other organizations in the industry and the transmission space. At national level there are structural changes to support these specific smart meters, when it comes to metering" (SW2)*

The impact of digital transformation on organisation structure in the traditional structures was not effective and flexible but was slow to adapt DT. This is further elaborated on in the next section below which reveals the impact of DT on organisational structures' adaptability and responsiveness.

*5.5.2.2 Adaptability and responsiveness*

The concept of adaptability and responsiveness emphasises how digital transformation can restructure organisational structures to support adaptation and responsiveness to the changes in industry. A number of participants highlighted the critical need for flexibility and agility as key responses in the digital transformation and the impact on organisational structures. As technologies are evolving it has become critical for organisations to be agile to adopt to the changes in technologies, but this also means that the organisational structure has to be responsive and agile.

Participants highlighted the fact that digital transformation requires structures that can quickly adapt to changes in the electricity industry and globally, or to the requirements of customers, and the emerging technologies which have become inevitable to the Namibian electricity industry. As some commented:

*"Agility is one in addition to resilience, and strategic ability" (EWH)*

*"So theoretically, I would obviously say yes, agility is one of those things that we definitely need, and we need to be as agile as possible" (EWH)*

*"Such flexibility is really lacking. We are not really into this flexible working environments were people adopt flexible working and doing pressing jobs irrespective of the time but able to relax then being fixed to the 7 to 8 working hours for life with mostly no output" (SNI)*

While another participant agreed that digital transformation brings out the need for agility within organisation structures for effective responsiveness. The participant commented

that agility is structurally limited within the electricity industry due to its high regulation in pricing and the high cost of capital of the electricity infrastructure, coupled with the traditional structures observed in the electricity industry.

> *"Here is where the challenge comes into play we are a third-tier company, and in a highly regulated industry. From a legislative and regulation perspective, we are almost painted into a corner with respect to many things that we can do and also to the degree that we can be agile. In reality, the implementation of an agile approach in our industry is a bit tougher because you can understand the bureaucracy of the approvals (traditional organisational structures). You are limited by specific regulations and all of those matters. Yeah, but it's agility is one of those things that we subscribe to" (EWH)*

> *"Productivity improves, marketing is conducted better and thus business becomes agile and respond quickly to change creating competitive advantage and making a difference to people ( creates a quick moving business, business stay ahead of the pack and have an edge)" (ETO)*

> *"We have now adopted what we call our delivery approach to agile delivery " (SNI)*

In contrast, another participant observed to be from the professional group ICT commented that their organisation responsiveness is agile and they are readjusting their structures for digital transformation.

> *"We found that we had 3 systems in GIS, operating differently, we had to discontinue one and incorporate into one. We had to retrain our peoples and readjust the business process to conform to the new digitalised space" (EW1)*

This had a key insight and perspective on the importance of this organisation having made a conscious decision to adjust their structure for digital transformation which highlights a clear impact of digital transformation on organisational structures. It also highlights the importance of having the right ICT structure in place and sitting on executive level to support adaptable organisation structures. As a participant from the group Human resource professional group commented:

> *"In my business unit I have a chief digitalisation officer, who implements the enterprise IT architects and this position defines how technology is going to*

*interact with business, ICT project management, ICT governance and security. This these individual drives digital transformation across the organisation" (EWH)*

Other participants commented on responsiveness:

*"None one fit structure but a effective structure depends on the context and specific environment of the business, it digital transformation strategy objectives. In my role I had to look at aspect of ICT governance, data integration, data science, server administration, and then the support there of. So, it integrates at the high level of organisation. In my business unit I have a chief digitalisation officer, who implements the enterprise IT architects and this position defines how technology is going to interact with business, ICT project management, ICT governance and security. The individual drives digital transformation across the organisation" (EW1)*

*"What the company wants to do is to integrate the systems in the cloud and have a dual data hybrid data management strategy. From the technology perspective we have a section dealing with data, management information system and we will add data scientist" (EW1)*

*"The traditional structures hardly really looked at efficiency. It's only a recent that we started looking at efficiencies. The impact and the benefits of technology really that we started looking at how can we maximize the benefit of efficiencies. The transmission line from generation to transmission and then to distribution do not have efficiency. By the time the electricity gets to the customer a huge amount of electricity have been lost. And our traditional structure created waste due to inefficiency.*

*And that was a result 90% of the time is poor management, so we were using the wrong technology, wrong cables. We were using the wrong equipment. With digital transformation one could monitor better and be predictive in were we are losing power and sort of maximize the power that we can get out " (EC3)*

The need for adaptability and responsiveness of structure was evident in participants' observations and provided evidence of how digital transformation impacted organisation structures in the need to collaborate through organisation-wide integration of technologies. This is further elaborated in the section below.

*5.5.2.3 Collaboration and integration*

This topic addressed a significant difficulty related to the adoption of technologies and explains the necessity of digital transformation in response to the numerous technologies

being introduced in the electricity industry. It further highlighted how digital transformation impacts organisational structure by emphasising collaboration and integration of various departments and functions to achieve broader business objectives, as compared to the introduction of multiple stand-alone technologies within specific functions.

The comment below from a participant indicates the impact of digital transformation on organisational structure as seen through the aspect of collaboration of the technical teams:

> *“There is now more collaboration between, let's say the technical field with the monitoring team which is more data oriented” (CHA)*

The participant went further to show how traditional structures’ collaboration was elaborate on and done ad hoc from within the functional department requesting the relevant technology. This department would then communicate with other functionality areas. Collaboration existed but elaborated the aspect of working in silos. Comment from participant:

> *“We at that stage were still having individual project managers per department. So, when the department initiated a project, it will then be run by that department. In this case it was a project engineer who was then given the function of a project manager to run the introduction of the technology. Obviously then, as a project manager becomes a central point looking at different cross functional needs. So, if you needed information from the IT space you would get those requirements from the IT people and then incorporate it. If you needed technical information, yes you could get it from the project team within the engineering function and then get the specifications together for such a system. So, it was handled by a project manager within the engineering business unit” (CHA)*

Another participant commented from a different angle on the lack of collaboration due to leadership trust as an industry which also borders on legacy issues in traditional structures.

> *“Leadership within the industry seem to lack trust and mostly did not buy in when very good ideas were proposed within the industry for collaboration on digital transformation and for the sake of efficiencies through digitalization” (ETO)*

The participants further observed that digital transformation has the possibility to dismantle silos and encourage cross-functional teams collaborating on projects which is

different from the traditional functional hierarchies in the electricity industry – that encouraged silos,

> *"In terms of cross functional teams, as mentioned for instance there is information sharing that happens between various functions now because you end up having people not working in silos anymore. They talk more now because of cross functional it breaks down silos but rather promote collaborating. People are not in silos where you just report to one manager. You might have different reporting structures because you have a cross functional team. You might have different reporting not really necessarily reporting or activities that might not necessarily report to your supervisor, but also to a different person" (CHA)*

Integration of structures necessitated cooperation and collaboration due to the interconnected nature of digital transformation as agreed by the different expert groups. Functions within the organisation had to also work together rather than in isolation to stay informed about site-wide developments and to meet customer expectations effectively as an integrated team. They commented as follows:

> *"If these roles are in place then digital transformation project will succeed as it integrates the entire business" (SNI)*

> *"So, in almost real time you can see what your liquidity is, how much cash compared to your liabilities you have. Then it immediately connects with the prepayment system so you can immediately draw anybody's records or history on consumption. It connects to some Excel spreadsheets that we actually have to update monthly so that the maximum demands always available and how much it is, and how much we consumed. Then it updates the financial systems as well we use Microsoft for the financial systems and then also it connects to the maintenance systems so we can see if the maintenance task has been taken care" (ETO)*

> *"I mean the optimization of digital, digitised organisation is communication whether it's a telephone, whether it's a cell phone, whether it's an SMS with a social media all of that. So, communication within top diagonal, bottom up, whatever it is like, it's so critical. An organisation that's not tapped into what the customers say about them might get lost as they might not be able to offer what the customer wants its only possible now because of the transformation that has taken place" (CTA)*

Also, due to the improved integration of information systems becoming more centralised or shared instantly and virtually, communication improved which further improved decision making. Participants below commented:

> *"We have changed our structures to comply to the new digital transformation where we will allow certain members of our team to operate from remote ends, which was not easier before the digital world came in, particularly driven by the COVID-19 that hit all of us. So, we have aligned our structures to allow for such type of environment" (SW2)*

> *"We have taken a decentralised approached were the technology is managed from the Business Units rather than ICT, this is still a legacy. What the company wants to do is to integrate the systems in the cloud and have a dual data hybrid data management strategy. From the technology perspective we have a section dealing with data, management information system and we will add data scientist" (EW1)*

> *"Formal daily work through social media of formal communication and informal communication anticipated. Get people involved in informal networks through communication and through different forms (e.g., WhatsApp groups, or life streaming of events) but now you will find not just Management or a specific department attending stakeholders network workshop but now allows other staff to be part of this deliberation. Contributes to greater participation by all employees" (ECR)*

Communication was also fostered by the integration of the organisational structure seeing that an employee may have different reporting lines in digital transformation compared to one reporting line created by the traditional structures. As commented:

> *"Traditionally a project within the electricity industry could be executed by an electricity professional. Now all of us need various professionals in the room, you need the legal representative the human capital representative to play a bit of a more active role because of the nature of these projects. DT required more innovative mind set and digital related project requires different skill set. And what we realize is it's hard for us to box people within one specific category. So, we now have project teams within the organization. So, you would have a project that is identified in terms of meeting all the criteria, then the freedom of these specific professionals to execute that project" (EWH)*

*“So, the electric electrical engineer will no longer just be reporting to the electrical executive in the situation where this individual now reporting from a project office perspective in a completely totally different setting to our Chief legal Officer, for example. This is the type of innovation we're doing all the way even on organizational structure levels” (EWH)*

*“This person sitting in supply business, they are in supply business part of DT, but in the same time also reporting to the CIO. So, they should become a matrix organisation where you have individuals in section or departments where they know what need to be done in terms of digitalisation. But they are managed by the CIO but also managed by the departmental head” (GRB)*

Participants did agree that collaboration and integration created a space for innovation and also the sharing of knowledge which in turn encouraged employees to become creative and thus also improve decision making. Participants commented as follows:

*“Digital transformation is all about technology, e.g., HR is not a technical person but introducing technological system for HR analytics allows to read trends and make decisions based on factual information. We introduce a system to help us, but HR is not trained in this space. But when trained they were able to do analysis for example our turnover rates, skills training conducted etc. This is HR analytics. So one is able to retrain within HR analytics when the system is introduce this can also provide reports for decision making” (ECI)*

*“We have given them the space to bring in the innovation based on what they have studied, and it was these young engineers who innovated and sort of developed the system that sort of allowed us to monitor the whole network across the operational area without stepping a foot on the ground and as they grow and they develop and mature, we then integrated them into our structure as permanent engineers responsible for those specific projects” (EC3)*

*“DT require more innovative mind set and digital related project requires different skill set. And what we realize is it's hard for us to box people within one specific category” (EWH)*

*“Digital transformation needs innovators. And innovators are people who have gone to universities, have gone through the innovation, kind of conditioning if I can put it that way, people who have looked at different things, people have looked at problems and sort of find solutions to those problems. So you needed*

*that kind of thinking to come into your business and look at the this differently with the eye of innovation?*

*Because you are now moving away from your traditional line of business to a sort of a development business development mindset which require skills like data, the analysis innovation" (EC3)*

The participants' insights draw attention to the impact of digital transformation on organisational structure through collaboration and now the need for skills upgrade and reskilling and the need to work together due to integrated platforms. For example, to be collaborative, the integrated structures to deliver business objectives, skills and talent had to change. The next section elaborates on these changes in roles and skills.

*5.5.2.4 Skills requirements and reorganisation*

Skills requirement was one of the factors through which digital transformation impacted organisational structures, as agreed by all participants and among the different professional groups. This was because, with digital transformation implementation, the skills level, skill type and roles are required to change due to the nature of the technologies introduced. This was evident in the electrical fields and technical employees from the different participants.

Due to the new way of doing things and internal process that had to change, the skill set also had to change. The electricity industry digital space also required a digital mindset and digital capabilities and not just technicians or artisans, which is critical to how the organisation structures are set. Also, with business processes that were changing, the type of roles required also had to go through a change, again showing how DT impacts organisational structures. It was observed from the participants' responses that these changes did not just apply to one or a certain function, but it ran across the entire organisation, even moving into the board structures.

Two participants from professional groups, technical engineering and the human resource professionals, agreed and commented.

*"They are changing roles by default because everybody is going digital and you find that there are new roles people are talking about, for example, you need experts for renewable energy that has to do with renewable energy technologies" (NTM)*

*“Enhance those skills for the people to be better equipped to handle the new adoption of this more data centric approach” (CHA)*

*“We went to a drawing system based on a database, which meant every drawing is accessible from anywhere and remotely so by various people. But that meant also getting new skills on board such as people with background in geometrics, something that is not common in the electrical industry. We had to then get in geomatics basically your drawing team to be equipped with handling, new ways of mapping, new ways of data creation and new ways of managing and protecting that data” (CHA)*

*“So you needed that kind of thinking to come into your business and look at this differently with the eye of innovation. Because you were now moving away from your traditional line of business to a sort of business development mindset which required skills like data, data analysis, and innovation” (EC3)*

Participants from ICT professional group commented:

*“We might have to introduce new skills, and people who are skilled in the art of data base management skills, AI and developers to assist the rest of the people and developing system and portals” (EW1)*

*“With the introduction of digital transformation, we have seen a shift in the aspect of trying to have engineering minded people or engineers who are not just registered professionals but also have competencies in ethics and continue to upskill themselves” (SNI)*

Another participant commented:

*“We are relatively fluid in terms of the human capital that we need, or the skills that we require. And it is a conversation we immediately get into once we have determined our strategic intent. And then following that obviously we looked at the other resource requirements from a financial perspective and then get into operations.*

*This is the approach that we took and in the background we continuously enforced or tried to get our employees to adopt the specific culture that's speaks towards innovation, transformation and just being adaptable to change” (EWH)*

More participants from technical group professionals also commented:

*“The roles will be changing yes; they do change here and that is the aspect like in terms of networks. For example, if you speak about substation automation, you then need to get to a level where you need somebody that can speak that language of interoperability of different technologies and combine it with soft skills for ICT” (NTM)*

*These skill sets were overseen by either a mining engineer or instrumentation technician. This is definite for change” (GRB)*

*“it's not an overall revamping of the organisation but it's a systematically approach in terms of bringing a few roles in the structure, but at the same time start to educate people that we are transitioning away from the traditional place to a new place” (GRB)*

Professional groups 3 and 2 participants agreed that digital transformation impacts organisational structure in that employees must now have a digital mindset and therefore require upskilling and new skills development.

*“If the people adopt a digital culture mind they will be able to adopt new skills and skills development and learn new things. For every organisation we have people who were traditionally employed but do not have digital transformation minds” (EC1)*

*“Anything can happen because that change will come with people heading to adopt new skills” (EC1)*

*“I think we just have to upskill ourselves with software Microsoft Excel and others” (NTM)*

Another commented that digital transformation created a shift in organisational structures as new skills are required:

*“Because new skills are needed.*

*When we talk about digital strategy one big component of digital strategy is big data.*

*Data is so critical, e.g. if you want to understand: how people consume power, where do they consume it, when do they consume it? You needed data as data is not just something that you go, and interview people and they give you that*

*information. No, you needed tools and equipment deployed within your system. Intelligent tools that were deployed within your system to read data and give you that information. But then you still needed someone who had an understanding how to interpret the data and make sense out of it. Thus, there was a need to change mindset and as a result you needed to change the structure and revamp the workforce so that we had a role in human resources that understand, can read, and interpret data. And this was at all levels" (EC3)*

#### *5.5.2.5 Conclusion*

Most participants agreed overwhelmingly that digital transformation and its impact on organisational structure has shifted organisational structures within the electricity industry but not at the same pace. The finding under these theme subcategories answers the primary research question with clear and elaborate examples of how digital transformation necessitates modifications to reporting lines, team structures, and hierarchies so as to make them compatible with new digital processes and technologies that impact organisational structures.

It must however be noted that not all changes are exactly the same for the different organisations and across the entire industry as elaborated by participants and the impact is also marginal. However, the research found that there are key emerging roles within the electricity industry such as data scientist, AI, and change management. Equally, the need to have a digital structure not directly within the ICT leg was critically observed, especially from professional group. This group was vocal on how crucial it is to drive digital transformation across the wider organisation. And also, to create a distinction of ICT as a pure network and technical infrastructure function that takes into consideration a digital transformation structure focusing on driving the DT across the wider organisation and not purely hardware and software.

Because of the big overlay/cost of capital infrastructure for the electricity industry, participants had differing views and did not expect the traditional hierarchical structures to change completely. But for some organisations the shift in roles and reporting line allowed combining some departments and or units (this was more observed in the transmission and distribution organisations). But findings also showed how the slow adoption in the electricity industry creates inflexibility with digital transformation which then has a slow impact on the hierarchal changes. The distribution organisations were more impacted in this regard. Leading to a slow margin of responsiveness in adopting digital transformation in the electricity Industry (on the distribution side) due to structures and high capital cost.

Not all participants experienced the same type of changes as the adoption of digital transformation was not the same given the type of organisations. But participants in general agreed that skills reorganisation as indicated before is crucial and is impacted by the introduction of digital transformation which thus impacts organisational structures.

### 5.5.3 Process optimisation and efficiencies

RSQ3: How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey?

The key theme for the RSQ3 provides deeper insights into and perspective on business process optimisation as a factor that influences how digital transformation impacts organisational structures. This includes changes to process workflows, procedures, the controls in new guidelines as per the new technologies, coupled with enhanced productivity as a result of digital transformation. These changes formed part of the emphasis of process optimisation and efficiency created through digital transformation and therefore not only impacted the electricity business model and the new way of doing things but also impacted a change in organisational structures.

With digital transformation the aspect of control was different and not as hierarchical or bureaucratic as in traditional structures. Thus, implementing digital transformation impacted how organisations exercised controls within the new way of doing business while trying to gain efficiencies in serving the customer better. Additionally, DT affected the organisational structure that enables DT, as process optimisation enhanced cross-functional collaboration, which in turn demanded response to DT adaptation for the right skills and digital capability. In contrast, participants indicated that they find that the cross-functional solution, which was a technology enabler for optimisation, had the potential to reduce the controls that were in place in a traditional structure – this was observed in the electricity industry. Therefore, impacting a change in a better fit structure.

Four subcategories were found for this theme based on the participants' responses and insights. The categories grouped together for affinity to form two final categories, namely process flow and controls, and operational instructions and efficiencies.

#### *5.5.3.1 Process flow and controls*

Digital transformation efforts that aimed at streamlining processes and enhancing efficiency significantly impacted organisational structures. There was consensus among participants that the controls that were put in place in the traditional organisational structures were altered by digital transformation and therefore altered organisational

structures. This was because with DT there were significant changes or reviews in how workflows were effective and responsive to the digital changes.

Participants agreed across the professional groups that due to integrated workflows the controls were lessened but with real time monitoring in place as operations were now streamlined and everyone had access to platforms and the platforms had different controls which were much more efficient than the traditional controls. For example, in the traditional structures, controls were lagging in serving a customer and with workflows being manual it took longer and at times inefficiencies were discovered at output level or after output level or when a client complain. In contrast, with DT the platform controls were of such a nature that when the process was not carried out as per workflow requirement, employees were able to pick up diversions immediately.

A key contribution from participants was that the altered flow of processes transformed the internal business process as a result of DT and had an impact on workflow modifications creating a new way of doing things. This further modified workflow instructions and controls.

Participants agreed and commented that streamlining workflow as a result of DT was important for maximising efficiencies. Additionally, it improved service delivery and allowed the provision of additional services. The efficiencies brought upon DT further reduced the amount of time spent looking for faults and ensured that the prompting of systems and deviations was systematic. This in turn improved response and turnaround times. Because staff did not have to spend an excessive amount of time looking for faults, productivity improved. This is a clear sign of how digital transformation impacted organisational structures. As one participant commented:

> *"We than had a work group/streams, steering committee to drive the process, and to look at the workflows and monitor the initiatives progress. We Identified champions and workstreams/working groups that ensured to bring the whole product delivery and monitored that the deliverables were met. It was important to conduct weekly meeting and it helped to get updates on progress and to address issues" (NTM)*

NTM further alluded:

> *"A little bit of workflows changed. For example, on the need for correctness of information, you had to change the way the processes were. The workflow processes have been established, so you had to change that" (NTM)*

Another agreed:

> *"To a certain extend we only had electricians and meter readers, who will go and solve the problem, then we will have meter readers who had to go from house to house. Now we did not need to have people to go out. People now sat behind the desk and monitored. ICT was in charge. The impact on time spend to resolve the problem in terms of workflows became efficient as they did not need to go out to detect losses or any bypass status to protect the company from losing revenue" (EC1)*

In terms of controls, real time monitoring through altering workflows in DT was significantly observed among participants from the various professional groups commented:

> *"The people are now able to monitor losses throughout the regions and pick up metres that that are not on the system and also provide signs of deviation. Employees are able to monitor and check what is happening. Hence, we needed new sub-unit called revenue protection due to the implementation of this digital technology" (EC1)*

> *"The implementation of digital tools also streamlines the work and processes for automation impacting the workflow or how you direct people.*
>
> *For instance, if you were doing maintenance during a breakdown, your people already had information, they also did not have to wait if they were not familiar with the geographical area, as the information was available. You also knew where the teams were and who was closest to what needed to be fixed" (SNI)*

> *"So on the aspect of the workflow, we have seen a lot of investment in these tools which is quite very good and the hands operation" (SNI)*

> *"I think from business processes that probably already happened only after the organisations interactions with different department. And they both saw the processes mapped out and saw how they could improve on those processes. So that would not have been possible if it wasn't for a digitised world where you could now map out the processes and change in real time some of those processes, and then have them implemented" (CTA)*

*“Augmented reality is a technology out there that can be used by maintenance crews. Which can either have a person on the outside, another one in the office, centrally and being able to see” (CTA)*

It was observed from participants that digital transformation impacted organisation structure changes, and how the controls that came along with these structural changes made matters easier and more effective, as commented:

*“DT allowed that workflows would show, and the system cannot be deleted even if one deletes it can be traced” (EC2)*

Participants also agreed on the interplay between efficiencies and quick response time as a result of DT’s impact on organisational structures which necessitated workflow alterations. As per comments below:

*“The major impact was spent on rectifying the problems that were picked up. But now in terms of workflow, it became efficient in the sense that where you would have people going out to inspect metres one by one and make a record of all the metres that are faulty or defective and come back and share that with another electricians that must go out. You now had a system that allowed electricians to pick it up immediately while at their desk and notify. This created efficiency to respond in the shortest possible time. So, in terms of workflow efficiency things move faster because people are specific on fault and without wasting time on fault finding” (EC1)*

*“It simplifies the work in terms of reporting and all that because you have the information readily. You can pull report quicker and organize your report quicker. DT smoothest out workflow processes and other things” (EC2)*

Another participant provided a different experience:

*“An attempt was made to align workflows to connect it to other functionalities such as the call centres. But it didn't materialise” (ETO)*

Because the drive for digital transformation impacted organisational structures to the extent that leadership now also had to alter the different workflows and reporting lines, the controls were regarded to be more efficient and effective in real time due to the technologies introduced.

Thus, the workflow alteration brought about the improvement of how instruction and efficiencies were improved again, giving a perspective on how digital transformation impacted organisational structures necessitated from workflow and business process optimisation. This then also impacted how operational instructions were carried out, as discussed in the next section.

*5.5.3.2 Operational instructions and efficiencies*

Digital transformation efforts necessitate the review and streamlining of a process where the workforce is enabled to reduce the time spent to look for faults due to system prompting automatically. As a result, participants agreed that the way operational instructions were carried out supported the understanding in how digital transformation impacted organisational structure by giving insights into how operational instructions were now carried out and also highlighting the change in organisational structures. As one participant commented:

> *"You could use technology to just do that. When you send the electrician, you still needed to cost and send the electrician to go do the actual repair work. But then the time reduces, you knew your response time to the fault also reduced. So I think in our industry, I think that's more of the role that I foresee happening we became more efficient when technologies were introduced, but not necessarily have less manpower" (NTM)*

> *It became efficient in the sense that where you would have people going out to inspect metres one by one and make a record of all the metres that are faulty or defective and come and share that with another electricians that must go out. But now the system allowed electricians to pick it up immediately while at their desk and notify. This created efficiency to respond in the shortest possible time. So, in terms of workflow efficiency things move faster because people are specific on fault and without wasting time on fault finding or waiting for an instruction from the Supervisor" (EC1)*

Participants had an overwhelming agreement that there were changes in reporting structures, team setups, or job responsibilities and obligations within the various organisation of the electricity industry. Therefore, implementing operational instructions and improving efficiencies through digital transformation had an impact on organisation structures and therefore also on how instructions were given and executed within the different operations.

*“So that changed the scope of efficiencies. Currently we had inefficiencies as we had electricians driving this line, who only drove a line to detect faults and sometimes they drove over 100 kilometres. Just to see how many poles were out, collected them and came back to repair them” (EC1)*

*Now, to also bring in a level of efficiency, we trained these employees in operating drones on the lines they monitor. So, apply a drone monitor. Is the line, OK? What are the coordinates? How many people do you need? Do reviews on material take them go repair and come back in the shortest possible time” (EC1)*

*“I can give an example our SCADA system in the network was critical because what SCADA did when there is a fault in the line it immediately flagged and spotted where that fault was. You did not need to spend the whole day sectionalizing trying to analyse and dig and find where the fault was.*

*It showed one the exact spot, and then one just had to go straight to the spot and resolve the problem. IT reduced the down time, and it also reduces the men hour and your overtime cost” (EC3)*

Participants agreed that efforts from DT and workflow optimisation in their respective organisations had caused some shifts in reporting structures, team composition, or responsibilities and accountability.

*“They had to get instructions from the control room what to do report back and get more instructions and all that. Now while that switching is underway, the other guys had to keep quiet, you know. Then with digitalization, a digitalized system provided more programmable access. So, the 16 channels remained open to everybody” (ETO)*

One participant commented how a review on HR manpower had to be made in terms of appointing clerks to do shortlisting. They now had the system prompting which was automatic and faster, as commented:

*“The system provides a criteria and automatically shortlist and removes all these kind of accusation around shortlisting and processing became quicker so the recruitment process becomes shorter” (EC2)*

In addition, participants agreed that the organisation and execution was somehow affected by the use of digital technology to implement operational instructions and improve efficiency as there was an noticeable reduction in spending time looking for

faults and the technologies introduced would have a system prompting aspect. This now impacts organisational structure in the number of employees now needed which might be different from the traditional structure.

*5.5.3.3 Conclusion*

In conclusion, participants agreed that the implementation of DT impacted organisation structure changes as DT requires that processes and workflows have to be reviewed for efficiency. There was a general agreement from the participants that this was happening and will remain a critical impact or change in the electricity industry. This can even impact the number of employees needed for different roles compared to the traditional structures.

A majority of participants agreed that inefficiencies existed due to electricians/engineers driving long distances to detect faults and repair them. But for those who had adopted DT, training the electricians/engineers to operate drones for line monitoring, achieved a new level of efficiency. Technologies provided quicker access to the condition of the lines, identify faults, determine the necessary resources, and expedite repairs, reducing downtime and minimising labour costs.

Additionally, the integration of digital systems and platforms in the network enhanced efficiency by pinpointing the exact location of faults, eliminating the need for time-consuming and manual troubleshooting processes. Ultimately, these measures not only optimise operational efficiency but also contribute to cost savings and improved service reliability in the electricity industry. And will then also require a considerable change in the structure and the number of employees needed. This affirms the impact of digital transformation creating a shift in organisational structures necessitated by optimisation of workflow and processes.

Participants observed that implementing digital transformation and optimising workflows and processes within resulted in alterations to reporting structures, team composition, duties, and accountability, which require effective monitoring. But a need exists for leadership to create self-organising teams by empowering employees for digital transformation and for the new way of doing work as a result of organisation structure changes. This is elaborated in the next section.

### 5.5.4 Empowering self-organising teams for successful digital transformation

RSQ4: How does the business create and enable self-organising teams that are important for the realisation of digital transformation?

The key theme in this sub-question was empowering self-organising teams for successful digital transformation. Three subcategories were found and discussed based on the participants' responses and insights. These were: addressing employees' belief and perceptions, team autonomy and empowerment, and ownership and accountability.

Participants in this theme and categories illustrate how their experiences with digital transformation led to the creation of teams capable of working autonomously and making effective decisions within their work environments, without relying heavily on supervisors or managers, but effectively utilising the introduced digital technologies. Most participants pinioned and highlighted the importance of autonomy as a vital factor for businesses to consider while implementing digital transformation, which naturally impacts organisation structures.

The theme and categories as per insights provided also address how digital transformation established environments that empower employees rather than making them feel obsolete. Thus, this evolved changing employee perspectives for the new roles and skills required. Participants agreed that employee awareness, skilling and training were crucial for understanding and utilising new technologies and adapting to changes brought about by digital transformation.

One important takeaway from participants' observations of significance was how the change in organisational structure necessitated through digital transformation enabled or required employees to take ownership of their jobs and working environment in the utilisation of digital technologies. This meant that employee had to be provided with autonomy in the space they were working and thereby be able to take accountability not just for their key roles and task but also accountability as a team.

Participants were very vocal in that digital transformation led to increased integration across the organisation and thus created lean structures. This further emphasised the significance of employees within their organisations having to possess strong collaboration skills, excellent communication, and analytical and problem-solving abilities. And again, this had an impact on organisational structures and roles, requiring leadership to empower employees across the organisation so that they became innovative, make decisions using digital tools, and adapt to digital changes.

Participants in this theme and sub-category also emphasised the organisation's need to provide ownership, engage and include its employees in the digital transformation process from the beginning. Hence, change management had to commence

immediately. Overwhelmingly, all participants commented that change in organisational structure signifies a shift in leading digital transformation by incorporating new talents for upskilling and creating new jobs. Digital transformation thus affects organisational structures through the integration of operations, combining structures, or creating matrix structures when empowering and creating autonomous teams and accountable roles for employees.

#### *5.5.4.1 Addressing employee beliefs and perceptions*

Because digital transformation was aimed at streamlining processes to ensure effective integration of the organisation operating model, it required well thought through strategies when it came to the implementation of the necessary changes and the new way of work.

Participants finding also indicated that some organisations would ensure that their digital transformation strategy starts with bringing employees on board and putting them at ease in the necessary changes that are happening and explaining to them why the changes are happening. This is in order to address employee beliefs and perceptions and avoid resistance.

As one participant said:

> *This created a counter problem were people did not embrace this because some people were scared of losing their jobs. Hence we found resistance when introducing digital tools, and where we wanted to use such tools. Employees felt the tools used were not complementing them but replacing them. This is how some projects failed because people did not want to utilise these tools" (SNI)*

Another  explained the resistance especially from field electricians:

> *"Our electricians and also their skills were impacted because now they we required to use computers as well. In fact, we have been experiencing some resistance because electricians trade test did not use computers, or they were not trained to use them, but they were now required use computers" (EC2)*

The participant continued to elaborate on the importance of bringing people along and for management not just to implement initiatives with a top-down approach, especially the fact that digital transformation brought about structural changes impacting employee jobs:

*"You know, when it was coming from one individual trying to bring things on board sometime, you get resistance and lack of buy in but when it was a corporate objective, a collective idea which is agreed upon it helped because it was supported. We found it not difficult to motivate as opposed to just one person trying to bring up all the ideas, and then you have to try to persuade the whole thing" (EC2)*

Another participant brought the perspective of leadership being able to come on board to breach the barrier of trust in the digital transformation process and how it affects the organisation structure:

*"The working together thing it is not depressing but makes one unhappy because it is expected that people work together to ensure conformity and standardisation in the systems within the industry (can get the same thing in the same format). So if leadership have reservations or see challenges they can explain it to the relevant party, the management of the company or to the G. This can assist leadership to think out of the box to and determine steps to improve the situation" (ETO)*

Two participants highlighted a different angle, and noted that the resistance was coming from a lack of training on the new way of doing things, and they had to find strategies to change employees' perceptions and beliefs around digital transformation and the change in the organisational structures:

*"Now when this digital transformation projects were carried out, with an aim to change a certain process, we found that training was lacking, and some employee did not know what to do. This then lead to resistance of what was implemented" (SNI)*

*"We were challenged on employee skills and buy in. Like at technical level there was an initiative to make it easy to do measurement for customers, previously they had to go in the field and take measurement which was time consuming. We introduced a new application and gave it to electrician level who had to download the app on their phone but found it difficult to adopt. And there was a lot of resistance from Electricians in updating the application. They also made a lot of mistakes with lower measurement and provided wrong quotations. The mistakes impacted customer relationships and financials. We demonstrated to them how to use the application and showed them the end results. This impacted the*

*organisation as digitalisation is about efficiency and it was very challenging to bring it to speed, but I think" (NTM)*

Participants in all professional groups had similarities and agreed on this theme in that it was critical to address the perceptions and beliefs of employees, as the implementation of digital strategy had impacted organisational structures which further created resistance. One of the group 2 expert group was vocal on effective strategies to employ employee buy-in:

*"We are cognizant that this resistant will be there we try to get to the bottom of why exactly there is resistance we try to characterize what change management methods do we employ now. In order for us to resistance doesn't become cancerous to what we're trying to achieve.*

*Once we have plotted a plan in terms of how to approach it, we have an understanding and then we will follow the traditional change management methodologies that allows us to make sure that we tick off the boxes in all areas such as strategy skills, staff values and all of those things. We accept but we also move towards finding ways to bring those individuals around to buy into what we are trying to do" (EWH)*

*5.5.4.2 Team autonomy and empowerment*

Digital transformation efforts necessitate the review and streamlining of processes where the workforce is enabled to reduce the time spent to look for faults due to system prompting automatically and working on their own as one participant commented:

*"Found skills challenge of employee skills and buy in. Like at technical level there was an initiative to make it easy to do measurement for customers, previously they had to go in the field and take measurement which was time consuming. We introduced a new application and gave it to electrician level who had to download on phone but found it difficult to adopt. And there was a lot of resistance from Electricians in updating the application and they made a lot of mistakes with lower measurement and provided wrong quotations. The mistakes impacted customer relationships and financials. We demonstrated to them how to use the application and showed them the end results. This impacted the organisation as digitalisation is about efficiency and it was very challenging to bring it to speed, but I think" (NTM)*

The participants agreed across the board on the key issues of autonomy and empowering employees. However, they also added that leadership played a role in ensuring the changes in organisational structures were inevitable and if employees were well trained they could lead their own work environments without the interference of management. As one participant said:

> *"This is actually the desired output for digital transformation that you would not want to have, If I can put it that way, micromanagement of the teams and the teams can actually make decision on their own using the information that is being provided to them through this digital transformation thing. If one implemented it successfully, I think that would be the end result really and it's just training and understanding and making sure of the complete buy in of all the team members that are there. Otherwise, if there's one of those team members that does not understand the role of digitization or why digitization, then they will not be able to" (NTM)*

> *"It was important to start looking at data scientist people that actually analyse the data that's collected holistically by the organisation and merge those type of information for management and for the technical teams to better make decisions because there's so many data on the hands. The silo parts within the organisation structures made it difficult but the digitised platform was available in all different sectors within the organisation" (CTA)*

Participants agreed that DT necessitated empowerment and encouraged autonomy by involving and enabling teams to autonomously make decisions based on digitised information. The goal is to minimise micromanagement and enable teams to assume ownership of their activities and responsibilities. Effective execution of digital transformation would enable teams to leverage the knowledge and resources accessible to them via digitisation.

Training and awareness were essential to secure full commitment of all team members, since a lack of comprehension or reluctance towards digitisation might hinder its efficacy. It was critical to gain the support of individuals to comprehend the aim and advantages of digitalisation in order to efficiently leverage its possibilities and its impact on organisational structures.

*5.5.4.3 Ownership and accountability*

Most participants indicated that when employees were empowered, and teams were given autonomy, they automatically took ownership and accountability of their task and responsibilities:

> *"Procurement this is no longer done manually where I had to fill in the book and sign when things are done. Now I sign from a digital platform to authorize certain things to happen and so basically the hierarchal decisions are made by the system through the system. Yes, we make the systems work for us not us working for the system" (SW2)*

> *"We needed 4-5 people to come in and sort of sit there and read the system, monitor the system, understand the system, read data, analyse data, produce reports so that business can make decisions" (EC3)*

Another participant mentioned how digital transformation impacted organisational structures in that employees now had new roles and skills that empowered them to independently make decisions based on the data they had at hand and be able to solve business decisions, which was different from traditional structures. As commented:

> *"What we learned as leadership we needed to empower our people for them to be able to do the job. What Simon Sinek said you are responsible for the result as the leadership. You are responsible for the people who are responsible for the results.*
>
> *There was a need to empower these people for them to be able to bring the result.*
>
> *We have allowed our people enough room to make decisions in the best interest of the business and also in the best interest of our customers and it made us sort of stand out amongst all the other distributors. Because people tend to make decisions with confidence when they know that my leadership has got my back.*
>
> *We empowered our people, by making them understand it was important that they could make decision. If a customer need to be connected immediately. Connect the customer and deal with the leadership later. If a customer needed to be disconnected now, disconnect the customer and deal with it there. With DT impacting roles and skills sped up processes of decision making and empowered our employees. Decisions could be made not just by one executive if one person were not there the other one was enabled to make a decision" (EC3)*

*“Where we did not have visibility like in the past, we now can log on to the system, even check progress of work” (EC2)*

*“Makes accountability easier” (EC2)*

*5.5.4.4 Conclusion*

Participants agreed that digital transformation implementation affects organisational structure changes, necessitating effective management of employees' attitudes and beliefs in the new way of doing things. Most expert groups advocated for offering employees forums where they could freely participate in change management during the implementation of digital transformation. Participants further concurred that the impact on organisational structures or introduction of new roles and skills was mostly met with resistance by employees as they believed and perceived that digital transformation would render people's jobs obsolete.

The majority of participants agreed on providing team autonomy and ownership by providing evidence that enabled their employees to make decisions in the best interest of the company. This created a good customer experience and set some of these organisations apart from their competitors. Participants also agreed that DT created lean structures and by empowering employees and giving them autonomy, it encouraged employees to feel supported by leadership where they had the freedom to make decisions confidently.

Digital transformation has had an impact on roles and the introduction of new roles and skills has led to faster decision-making processes and empowered employees to take ownership and thereby accountability of customer needs. Some participants emphasized through collaboration the importance of connecting customers immediately and dealing with any potential issues or consequences later, rather than waiting for executive approval which was mostly also enhanced through DT. Thus, participants agreed that DT impacts organisational structures which has changed the way of doing things and it is important to create strategies to empower employees through change management, upskilling and reskilling. This in turn has promoted a culture of trust, autonomy, and accountability within some of the participants’ organisations.

## 5.6 Chapter 5 Conclusion

Chapter 5 presented the results based on the 13 participants' responses from the interviews conducted. The findings results were summarised and supported by actual quotations that reflected each participant's perspective. A thorough comparison analysis

was conducted, especially where participants' opinions differed, to maintain a balanced study. The participants' responses were categorised based on the professional groups in terms of participants expertise area. this provided wider perspectives where necessary.

The results were analysed based on the primary research question supported and analysed through the sub-questions outlined in Chapter 3 and organised according to the four themes revealed during the coding process. The four themes which form the basis of the theoretical themes each had 4 or 3 subcategories to comprehensively cover the themes' perspectives. These were supported by the additional sub-questions asked during the initial interviews to cover insights and draw more information from participants. The subcategory from each theme was determined after the secondary coding process to ensure it related back and was supported with relevant quotations although not exhausted. The topics were determined using an inductive analysis approach.

### 5.6.1 Summary of finding of the theoretical themes

The participants' replies in the study were methodically grouped into four main topics. The themes covered several areas of my research question in the interview process. The diverse group of participants provided diverse perspectives not only from the areas of their professional expertise but also provided an experience within the sector their organisation was licensed to operate. The participants were also able to relate to the entire industry and some provided key insights for the industry. A complete overview of the participants' insights and diverse perspectives on the theme subcategory was presented from which the findings were formed systematically to provide comprehensive findings to which the research was able to link back to the various themes of the research questions' sub-questions to answer how digital transformation impact organisational structure. This also formed a systematic methodology where the discussions were divergent and then converged to the theoretical affinity groupings of both the literature review and the theoretical framework (this will be further demonstrated in chapter 6).

## Table 5

*Summary of findings – Themes*

| # | Themes subcategories categories | Findings | Themes - theoretical group |
|---|---|---|---|
| 1 | Role of Technology in Digital Transformation | This forms the foundation of the interplay between the introduction of digital technologies as a driver for digital transformation. It further had a focus on the role of technology in digital transformation, including the role of ICT, digital technologies, and the integration of various tools, systems, and platforms that enable digital transformation. All participants unanimously acknowledged that the introduction of digital technology had a significant impact on organisational and industry digital transformation. Participants further agreed that technology facilitates and accelerates digital transformation for the respective organisations. And how this required comprehending the strategic implementation and blending of different technologies including automation, developing digital tools and for some (artificial intelligence) and data analytics. This had a direct impact on organisational structures. | Digital Technologies as a Driver of Digital Transformation |
| | Driving Forces of Digital Transformation | The drivers of digital transformation were further observed from the organisation's need of trying to meet customer needs embedded in the challenges of weak services and trying to improve service delivery. Including the rapid technology changes in the electricity industry, the need to be innovative, so that with the electricity model changing the organisations were able to create a competitive advantage. There was a consensus among the participants for the above to be key drivers of digital transformation; both from the participants and all expert groups in the electricity industry. Which required digital transformation which then impacted organisational structures. | |
| | Organisational Aspects of Digital Transformation | Participants provided insights and perspective on how organisations align themselves from a structural and people management perspective with the introduction of digital transformation. It focused on how organisations adjust their structures and people management methods in reaction to the implementation of digital technologies. This subcategory theme drew insights on how digital transformation impacts organisation structure through the alignment journey, embedded in change management, leadership dynamic capabilities for technology uptake, agility, flexibility, and strategic planning. Participants further agreed that the digital mindset of employees and organisational context are important people-oriented problems in digital transformation which presents a critical dynamic of digital transformation impact on organisational structures as the introduction of the digitalised space impacts roles and jobs and ways of doing things. | |
| 2 | Structural Changes | The direct influence that digital transformation had on organisations and how they were structured is demonstrated by the observed participants' insights and perspective highlighting digital transformation responsive changes in some organisational structures within the electricity industry. The finding under this theme answers the primary research question elaborating how digital transformation frequently necessitated modifications to reporting lines, team structures, and hierarchies to make them compatible with new digital processes and technologies. But findings also show how the slow adoption in the electricity industry created inflexibility with digital transformation which then had a marginally slow impact on the hierarchal changes in most of the participants' responses. It also found that the change is different for organisations. | Digital transformation and Organisational Structures |
| | Adaptability and responsiveness | The concept of adaptability and responsiveness emphasises how digital transformation can restructure organisational structures to support adaptation and responsiveness. A number of participants highlighted the critical need for flexibility and agility as key responses in the digital transformation and the impact on organisational structures. As the technologies are evolving it became critical for organisations to be agile to adopt to the changes in technology, but this also meant that the organisational structure had to be responsive and agile. Requiring a change in | |

| # | Themes subcategories categories | Findings | Themes - theoretical group |
|---|---|---|---|
| | | organisational structure.<br>Participants highlighted the fact that digital transformation requires structures that can quickly adapt to changes in the electricity industry and globally, or to the requirements of customers, and the emerging technologies which have become inevitable to the Namibian electricity industry | |
| | Collaboration and Integration | It was evident from the participants' perspectives how this subcategory theme addressed the significant difficulty related to the adoption of technologies and explains the necessity of digital transformation in response to the numerous technologies that were introduced in the electricity industry. And how it changes the way business operates and consequently impacts organisational structure. It further highlighted how digital transformation impacted organisational structure by emphasising collaboration and integration of various departments and functions to achieve broader business objectives, as compared to the introduction of multiple stand-alone technologies within specific functions, that created silo working and no collaboration as seen in traditional structures. | |
| | Skill Requirements and Talent Management | Participants acknowledged the importance of talent management in the adoption of digital transformation, which affected organisational structures, but the impact was dependent on the type of organisation.<br>Skills requirement was found as another factor through which digital transformation impacted organisational structures as agreed by all participants and between the different expert groups. This was because, with digital transformation implementation, the skills level, skill type and roles were required to change due to the nature of the technologies introduced.<br>Due to the new way of doing things and internal process that had to change, most skills were set to change. The electricity industry digital space introduced technologies which also required a digital mindset and digital capabilities and not just technicians or artisans; which became critical to how the organisation structures were set. Also, with business processes that were changing, the type of roles required also had to go through a change, again also showing how DT impacts organisational structures. | |
| | Controls and Process Flow | Participants commented in summary that the implementation of DT is expected to significantly impact the electricity industry controls by requiring a thorough review of processes and workflows for efficiency and better controls which was a challenge with traditional structures' bureaucracies. Which then impact organisation structures. | Process Optimisation and Efficiency |
| | Operational Instructions and Efficiencies (merged Response Time and Fault Finding also) | The implementation of DT and workflow optimisation in organisations led to changes in reporting structures, team composition, duties, and accountability, necessitating effective monitoring especially in the technical operations. And most participants agreed that DT efforts that aimed at streamlining processes and enhancing efficiency significantly impacted organisational structures.<br>There was a consensus among participants that the controls that were put in place in the traditional organisational structures were altered by digital transformation and therefore altered organisational structures. This was because with DT there were significant changes or reviews in how workflows were effective and responsive to the digital changes. Participants agreed across the expert groups that due to integrated workflows the controls were lessened but with real time monitoring in place as operations were now streamlined and everyone had access to platforms and the platforms had different controls which were much more efficient than the traditional controls. For example, in the traditional structures, controls were lagging in serving customers on cost estimates, and because of the workflows being manual it took longer and at times the inefficiencies were only noticed at output level or after output level and when customers lodged complaints. Whereas with DT, the platform controls were of such a nature that when the process was not carried out as per workflow requirement employees were able to pick up immediately on diversions, which was a clear impact on organisational structure changes.<br>Digital transformation impacts organisational structure through the upskilling and reskilling of | |

| # | Themes subcategories categories | Findings | Themes - theoretical group |
|---|---|---|---|
| | | employees. DT also impacts organisational structure in that the new way of working with enhanced efficiency by utilising digital tools to quickly identify faults, allocate resources, and expedite repairs, reducing downtime and labour costs. Which was a big challenge in traditional structures. | |
| 3 | Addressing employee beliefs and perceptions | There was an observation from participants that digital transformation implementation impacted organisational structure, requiring effective management of employees' attitudes and beliefs. All participants from the different expert groups advocated for employee forums for change management. However, others also agreed that resistance arises from employees who perceive digital transformation as job losses or who were not taken through the journey from the beginning. | Empowering self-organising teams for successful digital transformation |
| | Team autonomy and empowerment | Participants had an overwhelming consensus that providing team autonomy created ownership which enabled employees to make decisions in the company's best interest, creating a good customer experience and setting organisations apart from competitors. The upskilling and involvement empowered team members with confidence created through lean structures (which is an impact on organisation structure) through the improvement of workflows and process optimisation and understanding their roles. | |
| | Ownership and Accountability | Digital transformation changed jobs and skills, accelerated decision-making, and empowered workers to own and be accountable for customer needs and driving business objectives. Thus, participants agreed that DT transformed organisational structures and that change management, upskilling, and reskilling were needed to empower employees. This fostered trust, autonomy, and accountability in most participants' organisations as employees did not rely heavily on the traditional way where ownership and accountability were mostly left to supervisors or managers. | |

*Note*: Table created by author.

# CHAPTER 6: DISCUSSIONS

## 6.1 Introduction

This chapter presents the discussion of the findings from Chapter 5 in conjunction with the literature review, linking it the theoretical conceptual framework to analyse how digital transformation impacts organisational structures. The chapter followed a systematic process with each theme of the research finding being explored within each theme's subcategories and then compared and contrasted with the literature review and theory in Chapter 2.

This was done by using the primary research question and its sub-questions as formulated in Chapter 3 and using the participants' findings to systematically compare the literature review and support it with theory.

Chapter 6 further provides discussion to answer the primary research question of how digital transformation impacts organisational structure in the Namibian electricity industry as found in the participants' perspectives and contrasted back to the theory findings. The findings in this chapter also address findings related to the different constructs of digital transformation and organisational structures providing various components of theory that emerge from the change in the way organisations do things as impacted by digital transformation and how this impacts organisation structure. The four key themes are digital technology as a driver of digital transformation, digital transformation and organisational structures, process optimisation and efficiency, the empowering of self-organising teams for successful digital transformation. Each theme is discussed thoroughly under the different subcategories of each theme as contrasted back to the literature review and supported by theory.

The primary research question was: **How does digital transformation impact organisational structure?**

The primary research question had four sub-questions which were:

**RSQ1**: How do organisations align their structure for a digital transformation journey?

**RSQ2**: What is the impact on organisational structure post/during the digital implementation journey?

**RSQ3**: How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey?

**RSQ4**: How does the business create and enable self-organising teams that are important for the realisation of digital transformation?

The following themes and subcategories emerged out of the findings:

Theme 1: Digital technologies as a driver of digital transformation

Theme 2: Digital transformation and organisational structures

Theme 3: Process optimisation and efficiency

Theme 4: Empowering self-organising teams for successful digital transformation.

The themes' subcategories formed from the participants' responses for each theme were the following:

Theme 1: Digital technologies as a driver of digital transformation subcategories:

- Role of technologies in digital transformation
- Driving forces of digital transformation
- Organisational aspects of digital transformation

Theme 2: Digital transformation and organisational structures subcategories:

- Structural changes
- Adaptability and responsiveness
- Collaboration and integration
- Skill requirements and reorganisation

Theme 3: Process optimisation and efficiency subcategories:

- Controls and process flow
- Operational instructions and efficiencies
- Response time and fault finding

Theme 4: Empowering self-organising teams for successful digital transformation subcategories:

- Addressing employee beliefs and perceptions
- Team autonomy and empowerment
- Ownership and accountability.

The findings for each theme are discussed thoroughly under the different subcategories of each theme's findings and contrasted back to the literature review and supported by theory. A summary conclusion then follows for Chapter 6.

Thirteen participants from the electricity industry were interviewed. The participants were categorised into three groups based on their management level for a more detailed study and perspectives. The designations Top Management CEO (TMC), Top Management Executive Management (TMEM), and Top Management Senior Management (TMSM) were created to accommodate organisational structures where positions titled Senior Management or Manager (instead of Executive Management), but nonetheless report directly to the CEO on the organisational chart. This classification was deliberate in order to comprehend the phenomenon from many perspectives and levels among the participants. A further identifier was created for the different sectors of the electricity industry which was either transmission, generation or distribution. This was necessitated to gain insights into the different responses of digital transformation and its impact on organisational structures given the different circumstances and context of digital transformation.

The next section presents the findings for each theme, discussed thoroughly under the different subcategories of each theme' findings and contrasted back to the literature review, supported by theory triangulation.

## 6.2 Discussion Theme 1: Digital technologies as a driver of digital transformation

**RSQ1**: How do organisations align their structure for a digital transformation journey?

**Theme emerged**: Digital technologies as a driver of digital transformation.

This theme is framed around the foundation of the interplay between the introduction of digital technologies as a driver for digital transformation. The focus is on the role of digital

technologies, and the integration of various tools, systems, and platforms that enable digital transformation including the role of ICT fuelling IT-related activities.

Participants provided insights and perspective on how organisations align themselves from a structural and people management perspective with the introduction of digital technologies. Theory supports this as Vial (2019) refers to DT as a process of using digital technologies to fundamentally change how businesses operate, deliver value to customers, including the scope and speed, and scale at which these changes extend to a change in organisational structures. When contrasted with the theoretical framework, the researcher presented that the firms use of digital technologies drives organisational-wide adoption of digital transformation and creates value networks as decision making improves through the use of platforms (Kraus et al., 2022). Therefore, participants' findings provided insights and perspective and are consistent with the observations made by other scholars regarding the effects of digital technologies on different facets of the organisation, encompassing the individual, organisational, industry, and social levels (Feliciano-Cestero et al., 2023; Li et al., 2018). This compares to the theoretical framework indicating how a firm's use of digital technologies alters an organisation to enable gaining competitive advantage (Rozite & Kamiya, 2022; Saunders & Lewis, 2017; Vu & Hartley, 2022). Secondly, the findings pertaining to this particular theme address the underlying forces driving digital transformation. These forces centre around the improvement of customer service in the use of digital technologies and enabling productivity improvement as necessitated by the changes taking place within the electricity industry, and the need for innovation resultant in digital technologies driving digital transformation (Singh et al., 2020).

This supports Hanelt et al.'s (2021) theoretical framing of digital transformation as the organisational change that is initiated and influenced by the extensive dissemination of digital technologies. Hanelt et al. (2021), however, extend the definition placing a focus on organisational change: "Organizational change, viewed as a 'difference in form, quality, or state over time in an organizational entity" (p. 1160).

The finding in the theme also concurred and provided a focus on the people-orientated challenges in digital transformation and organisational components which include the alignment journey, change management, leadership, dynamic capabilities, agility, flexibility, strategic planning, digital mindset, technology uptake, and organisational context as found in literature (Hanelt et al., 2021). These dynamics at play eventually impacted the need for digital transformation which then impacted organisational structures (Singh et al., 2020). Participant findings are supported by various academic

authors and the theoretical framing that in the electricity industry, digital technologies enable organisations to create value paths such as customer value propositions and networks, digital channels, and agility for the organisation which necessitates the organisation to consider aspects such as employee self-empowerment to deploy digital transformation (GIZ, 2022; Glickman & Leroi, 2015; Havle & Dursun, 2019).

The categories of the theme findings are further expanded as contrasted from the different theoretical views below.

### 6.2.1 The role of technologies in digital transformation

According to Vial (2019), the adoption of digital technologies is not the means to an end, citing that digital technology becomes effective and necessitates a wider digital transformation across the organisation. It was found in the research that all participants unanimously acknowledged that the introduction of digital technologies had a significant impact on organisational and industry digital transformation (Singh et al., 2020). Participants further agreed that technology facilitates and accelerates digital transformation for their respective organisations. And how this required comprehending the strategic implementation and blending of different technologies including automation, developing digital tools and for some (artificial intelligence) and data analytics (Kraus et al., 2022).

Participants also found that digital technology is disrupting the competitive advantage of organisations in industries (Singh et al., 2020). These disruptions demand change in business strategies (Rozite & Kamiya, 2022; Saunders & Lewis, 2017; Vu & Hartley, 2022) and models which reflects the increasing importance of technologies in modern business (Kraus et al., 2022). The disruptive process creates a need for technology integration into overall business planning and therefore requires a wider digital transformation drive (Fitzgerald et al., 2013; Singh et al., 2020; Vial, 2019). The literature supports the finding from the research disclosing that most technologies were disbursed in isolation and created legacy systems that were not integrated with the wider organisation. This is supported by Bharadwaj et al. (2013a) citing that the role of digital technologies does require to be integrated within the overall organisation, creating a need for a wider digital transformation drive.

### 6.2.2 Drivers of digital transformation

Due to the challenges faced by the energy industry in keeping up with technological advancements and the consequences of not doing it, many organisations have

introduced digital technologies to ensure that they create customer value (Ferrag & Maglaras, 2020).

The results finding disclosed the key drivers that push organisations towards embarking on a digital transformation journey. Factors mentioned included the need to stay competitive, responses to industry changes, and meeting of customer demands, driving innovation, and enhancing productivity. The research analysis aligned with literature (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020). When compared to the literature, this finding concurs with the literature reviewed in which theory posits that the disruptive nature of digital technologies creates a strategic need to integrate overall business planning to respond to the changing nature of digital technologies and therefore requires a wider digital transformation drive which in turn impacts organisational structures (Fitzgerald et al., 2013; Singh et al., 2020; Vial, 2019).

While this is true, the research finding provided an angle of organisational efficiency (which is supported by extant literature) which comprises improving by the continuous utilisation of technologies, improving customer satisfaction, and therefore necessitating the integration of people into business processes to efficiently run systems (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020).

This means that not only do technologies or customer value and efficiency drive digital transformation, as the findings indicated other aspects such as people and change management also drive digital transformation which in turn also impacts organisational structures (Hitt et al., 2021; Teece, 2007). This is also supported by the theoretical framework presented.

### 6.2.3 Organisational aspects of digital transformation

The research finding confirms that the organisational aspects of DT highlighted the challenges of DT, especially the people and organisation aspect which with digital transformation and the drive for it requires leadership to not only have a digital mindset but to also take into consideration the readiness of employees for digital transformation and ensuring dynamic capabilities of leadership to drive digital transformation (Hitt et al., 2021; Teece, 2007; Vial, 2019). This aligns with extant literature and answers the research question of how digital transformation impacts organisation structures necessitated through the process of change management and the people side of things. Therefore, the introduction of the digitalised space impacts roles and jobs and ways of doing things (Verhoef et al., 2021). It was found in the literature that the challenges of people and change management are key factors mentioned, including the leadership

impact on digital transformation and its impact on organisational structures (Samimi et al., 2022).

On the contrary, literature found that as much as DT improves operational performance by embracing the impact of digital technology on society and industries, theory advocates for leadership to understand the nature and implication of the structural changes and barriers that affect the drive for digital transformation and people were considered a critical aspect (AlNuaimi et al., 2022; Feliciano-Cestero et al., 2023; Vial, 2019). The findings of the research align with the literature finding as most organisations that drive for digital transformation realised the need to bring the people along to ensure effective deployment of people. The research finding highlighted employee resistance to DT as a lack of change management. This confirms the theoretical view of Samimi et al. (2023) who posit that leadership is a key aspect that drives digital transformation and influences structures and people management methods in reaction to the implementation of digital technology (Vial, 2019).

This was evident in the research findings which highlighted the alignment journey, embedded in change management, leadership dynamic capabilities for technology uptake, agility, flexibility, strategic planning, digital mindset of employees. The extant literature supports the organisational context of people-oriented problems in digital transformation which presents a critical dynamic of digital transformation impacting on organisational structures (Samimi et al., 2022; Singh et al., 2020; Vial, 2019).

Given the interconnectivity of various aspects in business, such as the products, processes, services offered, and the expansion of digital infrastructure, there is a critical need for leaders in organisations to adopt a holistic approach and better their dynamic capabilities to drive digital transformation which necessitates a change in organisational structures (Hitt et al., 2021; Teece, 2007).

### 6.2.4 Conclusive findings for theme 1

The research established the role of digital technologies as a driver of digital transformation and how the introduction of digital technologies in the electricity industry plays a role in how organisations align themselves from a structural and people management perspective with the introduction of digital technologies. The introduction of digital technologies significantly impacts organisational and industry digital transformation. The research finding acknowledge the role of ICT, digital technologies, and the integration of tools, systems, and platforms as being crucial to accelerating digital transformation and enhancing organisational structures.

The research further found the Namibia electricity industry's use of digital technologies fundamentally change how businesses operate, deliver value to customers, and these changes extended to the changes in organisation structure due to the new way of doing things and some roles that are changing.

The research finding for this theme also highlighted the slow adoption of digital transformation by the industry due to the introduction of digital tools in isolation which necessitates the need for a wider integration of digital tools in organisations and thus drive digital transformation to create value networks as decision making improves through the use of platforms (Kraus et al., 2022).

The finding also suggests that Top Management must understand how firm use of digital technologies alters and enables an organisation to gain competitive advantage and therefore requires a digital mindset across the organisation.

By integrating technologies throughout the organisation, customer service improved due to the use of digital technologies. This further links the finding where the use of technologies drives digital transformation which then also drives productivity necessitated by the changes brought about in the organisation structures and workflows.

The finding further suggests the following:

- There are people-orientated challenges experienced with the introduction of new technologies and the need for digital transformation must include strategic change management as a strategic planning tool to enable the adoption of digital transformation.
- People must be brought along the journey of digital transformation.
- Leadership dynamic capabilities, agility, flexibility, strategic planning, and digital mindset were also found to be critical in the uptake of digital technologies, and organisational context as found in literature (Hanelt et al., 2021).

The findings are supported by various academic authors that digital technologies enable organisations to create value paths such as customer value propositions and networks, digital channels, and agility for the organisation and necessitate the organisation to consider deploying digital transformation which can only be realised with marginal changes in organisational structures. The findings on how organisational structures are impacted are covered in the next section below.

## 6.3 Discussions Theme 2: Digital transformation and organisational structures

**RSQ2**: What is the impact on organisational structure post/during the digital implementation journey?

**Theme emerged**: Digital transformation and organisational structures.

This theme's findings will expand from the previous section and form the basis and core of this research and provide insights into how digital transformation impacts organisational structures. When considering how digital transformation affects organisational structures, the theme was theoretically framed into four categories to determine how digital transformation impacts organisational structures. These were aspects of structural changes observed from digital transformation, the adaptability and responsiveness of structures as a result of digital transformation, collaboration and integration within organisational structures, and the skills requirements (finding new skills and skills reorganising) which all became necessary due to the impact of digital transformation on organisational structures and aligns to academic theory (Carton et al., 2023; Verhoef et al., 2021; Vial, 2019).

### 6.3.1 Structural changes

The direct influence that digital transformation had on organisations and how they were structured is demonstrated by the participants' insights and perspective highlighting digital transformation responsive changes in some organisational structures within the electricity industry. The finding under this theme answers the primary research question elaborating how digital transformation frequently necessitated modifications to reporting lines, team structures, and hierarchies to make them compatible with new digital processes and technologies. But findings also show how the slow adoption in the electricity industry created inflexibility with digital transformation which then had a marginally slow impact on the hierarchical changes. This led to a slow margin of responsiveness. Not all participants experienced the same type of changes as the adoption of digital transformation was not the same given the type of organisations.

These findings are in line with literature which positions that one of the major challenges of digital transformation is to establish an organisational structure capable of supporting it (Verhoef et al., 2021). Theory further found that to master speed and collaboration, organisations must reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Traditional bureaucratic organisational structures that were considered to be rigid

were not adapting well to new market conditions, which highlights the need to introduce new forms of organisational structure better suited to the demands of digital transformation (Mirković et al., 2019).

The research finding disclosed that the electricity industry was not flexible for digital transformation adaptability of organisational structures and flexibility (due to a Unionised Electricity Industry) which is a requirement in digital transformation. This reflects back to DT's impact on organisational structure from traditional to more adaptive and agile structures. Bringing it back to theory, various authors also found that digital transformation creates informal and formal networks (Bouncken et al., 2021; Kraus et al., 2022), and this demands an understanding of the relationship between digital transformation and organisational structures and that traditional structures are not flexible (Hanelt et al., 2021; Verhoef et al., 2021).

The research finding was overwhelming on how leadership had to consider the ICT organisational structure change, as it impacted DT. The lack of digital/ICT experts which impacts marginal changes in hierarchical and traditional structures was often commented on. In relation to theory, Singh et al. (2020) believe that organisations may consider changing their structures to drive the digital drive and specifically the ICT structure may also require changing from having hardware and information system teams to having teams consisting of analysts, programmers, and chief digital officers (CDOs). This means organisations may consider changing their structures that will drive the digital drive (Jayachandran et al., 2022; Von Oertzen, 2019; Vu & Hartley, 2022; Wang et al., 2022). This was also framed in the theoretical framework and supported by literature (Vial, 2019).

Research findings concur with theory, in that digital transformation impacts organisational structures in that if the structures are not aligned with digitalisation the rollout strategies are impacted (Carton et al., 2023; Morrison & Mota, 2021). This is what Petriglieri & Petriglieri (2020) refer to when setting up structures for task to enable achieving of an overall organisation output (which for this study is driving digital transformation).

This finding concurs with literature and the theoretical framework presented in Chapter 2, revealing that the use of technology demands a digital mindset and ICT support to fully embed the process within the organisation (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020).

The research finding also disclosed that change in organisational structure is being more observed in the drive for AMIs, renewables and the creation of subsidiary companies. Although theory supports this finding it went further to highlight that in the electricity industry, digital technologies enable organisations to create value paths such as customer value propositions and networks, digital channels, and agility for the organisation (GIZ, 2022; Glickman & Leroi, 2015; Havle & Dursun, 2019). For example, smart grids and AMI have reduced outages for distributors, improved grid stability for both transmission and distribution, and through AMI increased the accuracy of billing and metering impacting the roles of meter readers (thus realising value channels) (Nazari & Musilek, 2023).

The results further disclose that the impact of digital transformation on organisation structure is that traditional structures were not as effective and flexible but were slow to adopt DT. This is one of the key issues highlighted in the literature, which is that the major challenge of digital transformation is to establish an organisational structure capable of supporting it (Verhoef et al., 2021). The body of literature also discloses that to achieve and master speed and collaboration, organisations must reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Literature also found that traditional bureaucratic organisational structures are rigid and may not adapt well to new market conditions, which highlights the need to introduce new forms of organisational structure better suited to the demands of digital transformation (Mirković et al., 2019). Research, however, has shown that most organisations are either slow to adopt (Kraus et al., 2022), or those that adopt have not yet seen the results across all levels (Fitzgerald et al., 2013).

This flows into the next section below focusing on the impact of DT on organisational structures' as necessitated by adaptability and responsiveness.

### 6.3.2 Adaptability and responsiveness

The research finding of adaptability and responsiveness emphasises how digital transformation can restructure organisational structures to support adaptation and responsiveness. The research finding highlighted the critical need for flexibility and agility as key responses in the digital transformation and the impact on organisational structures. The literature review findings compared the same and authors found that with digitalisation evolving it became critical for organisations to be agile to adapt to the changes in technology, but this also meant that the organisational structure had to be responsive and agile technologies need to enable organisations to create value paths

such as customer value propositions and networks, digital channels, and agility for the organisation (GIZ, 2022; Glickman & Leroi, 2015; Havle & Dursun, 2019).

The theory finding aligns to the research finding disclosing the fact that digital transformation requires structures that can quickly adapt to changes in the electricity industry and globally, or to the requirements of customers, and the emerging technologies which have become inevitable to the Namibian electricity industry. For example, literature revealed that the electricity industry has also seen a rapid increase in digital technologies being introduced into the utilities (Von Oertzen, 2019). The emergence of new technologies and the obsolescence of older equipment are often key drivers for organisations to undergo digital transformation. In the energy industry, the adoption of digital technologies enables more efficient operations, optimises energy production and distribution, and improves equipment monitoring and maintenance which naturally necessitate a change in organisational structures (Jayachandran et al., 2022; Oosthuizen et al., 2018; Vu & Hartley, 2022).

The research finding highlighted that digital transformation brings out the need for agility within organisation structures for effective response. A key finding cited in the research was the observation that agility is structurally limited within the electricity industry due to its high regulation in pricing and the high cost of capital of the electricity infrastructure coupled with the traditional structures observed in the electricity industry. Bringing this back to the literature review, as much as theory also found this aspect of cost, academics labelled it to be reflected in electricity tariff costs which further fuel a high outcry from customers (Verhoef et al., 2021). Theory refers to this as digital technology's disruptive nature (Vial, 2019; Wang et al., 2022).

This explains the observation especially in the distribution sector which deals more with the end customer in the supply of electricity and could be a factor in explaining the slow adoption in digital transformation. And the fact that the industry is regulated does not make it easier to adapt and be responsive which further reflects in the organisational structures that are slow in changing and response to an agile approach for some of the organisations. Digital transformation can lead to the removal of hierarchical structures in favour of more flexible and responsive structures (Singh et al., 2020). This can involve the creation of cross-functional teams, the adoption of agile methodologies and business processes (Verhoef et al., 2021), and the empowerment of employees to make decisions and take ownership of their work (AlNuaimi et al., 2022; Kraus et al., 2022; Vial, 2019; Vu & Hartley, 2022).

In contrast, another finding observed some organisations' responsiveness to be agile as they have readjusted their structures for digital transformation.

To support this, findings show how this organisation made a conscious decision to adjust their structure for digital transformation which highlights a clear impact of digital transformation on organisational structures. It also highlights the importance of having the right ICT structure in place and sitting on executive level to support adaptable organisation structures in the drive for digital transformation. The role of CDO is a further finding observed as shift in structure. This supports and concurs with literature; however, literature further highlights the importance of a company to make strategic moves in attracting employees who embrace digital competencies (Samimi et al., 2022). Other scholars highlight the independence and forming teams as another business unit or to be temporary cross-functional teams (Carton et al., 2023; Morrison & Mota, 2021).

The need for adaptability and responsiveness of structure was a key finding and provided evidence of how digital transformation impacted organisation structures in the need to collaborate through organisation-wide integration of technologies. This is further elaborated in the section below.

### 6.3.3 Collaboration and Integration

Theory proposes that a key impact of digital transformation on organisational structures is from the network collaborations that evolve among employees (Hund et al., 2021). Organisations that are implementing digital strategy must build supportive organisational structures to drive digital strategy, seeing that scholars agree that organisational structures follow strategy (Hanelt et al., 2021).

The research finding addressed the significant difficulty related to the adoption of technologies. The findings further highlighted how digital transformation impacted organisational structure by emphasising collaboration and integration of various departments and functions to achieve broader business objectives, as compared to the introduction of multiple stand-alone technologies within specific functions, that created silo working and no collaboration as seen in traditional structures. Although it concurs with literature, Hund et al. (2021) expanded that in the early stages, research was primarily concerned with the introduction and implementation of these technologies and was largely concentrated within the field of information technology (IT), referred to as digital technologies which was done in isolation (Kraus et al., 2022; Westerman et al., 2014).

One of the major challenges of digital transformation is to establish an organisational structure capable of supporting it (Verhoef et al., 2021). To achieve and master speed and collaboration, organisations must reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Digital transformation can lead to the removal of hierarchical structures in favour of more flexible and responsive structures (Singh et al., 2020). This can involve the creation of cross-functional teams, the adoption of agile methodologies and business processes (Verhoef et al., 2021), and the empowerment of employees to make decisions and take ownership of their work (AlNuaimi et al., 2022; Kraus et al., 2022; Vial, 2019; Vu & Hartley, 2022).

Academics also found in literature that organisations had to foster cultures that embrace experimentation, risk-taking, and continuous improvement, and that values collaboration, transparency, and customer-centricity (Li et al., 2018; Teece, 2007; Weill & Woerner, 2018).

The research further found that the impact of digital transformation on organisational structure was seen through the aspect of collaboration of the technical teams with the monitoring team, but also the aspect of a team now being data orientated, for example the metering electricians who no longer required to go back and forth in the field to do diagnostics. And consequently, having a suggested impact on the new way of interacting within the organisation's space, this research finding aligns with literature recommendation on embracing innovative culture (Petriglieri & Petriglieri, 2020).

Findings further showed how traditional structures' collaboration was elaborate and done ad hoc from within the functional department requesting the relevant technology. This department would then communicate with other functionality areas. Collaboration existed but elaborated the aspect of working in silos.

A different perspective was further observed, namely that the lack of collaboration due to leadership trust also borders on legacy issues in traditional structures. Now literature posits that digital transformation creates informal and formal networks (Bouncken et al., 2021; Kraus et al., 2022), and this demands an understanding of the relationship between digital transformation and organisational structures (Hanelt et al., 2021; Verhoef et al., 2021). This ties in with findings of the research that digital transformation has the possibility to dismantle silos and encourage cross-functional teams collaborating on projects which is different from the traditional functional hierarchies in the electricity industry that encouraged silos. This was seen as a lack of sharing of information.

This brings us back to the findings that integration of structures necessitated cooperation and collaboration due to the interconnected nature of digital transformation.

Functions within an organisation also had to work together rather than in isolation to stay informed about site-wide developments and to meet customer expectations effectively as an integrated team. This is supported by Kraus (2022) but who further reasoned that it set the course for the innovative future business models.

Also, due to the improved integration of information systems becoming more centralised or shared instantly and virtually, communication improved which further improved decision making. This finding aligns with what was found in the literature review but highlighted the interdependence of teams for final service output (Petriglieri & Petriglieri, 2020). This required coordination, planning, organising, and commanding to ensure that business carries out what is required (Vial, 2019). The level at which decision making is taken and autonomy is exercised is key and depends on the whether the task is a rule-based or output-based activity (Cosh et al., 2012; Singh et al., 2020).

Research findings aligned with theory in that communication was fostered by the integration of organisational structure seeing that an employee may have different reporting lines in digital transformation compared to one reporting line created by the traditional structures (Kraus et al., 2022). Finding do concur with literature in that collaboration and integration created a space for innovation and also the sharing of knowledge which in turn encouraged employees to become creative and thus also improve decision making to create customer experience(Bharadwaj, El Sawy, et al., 2013a; Von Oertzen, 2019).

The research finding and theory concur that collaboration is critical in the digital transformation journey with a triggering effect on the organisational structure through the need for skills upgrade and reskilling. For example, to be collaborative one needs to integrate structures to deliver business objectives; however, skills and talent have to change, as discussed next.

### 6.3.4 Skills requirements and skills reorganisation

The research disclosed the importance of reskilling and upskilling in the adoption of digital transformation, which has a direct effect on organisational structures, but the impact depends on the type of organisation. Although the finding does not explicitly align with Teece's (1996) fundamental argument that organisation structures evolve or are

altered by the type of disruptive changes that occur to gain market competitiveness due to external pressures.

The finding on skills demonstrates how digital transformation impact organisational structures. For example, a key finding was that with digital transformation implementation, the skills level, skill type and roles were required to change due to the nature of the technologies introduced. This is supported by literature where academics agree that digital technology introduction required the integration of business processes to cut across traditional functions as it focused on customising product for customers, unlike standardising products as in the traditional set up (Carton et al., 2023; Vial, 2019). However, with digital technology focusing on the work setting, digital transformation anticipates the environmental changes across the organisation observed not only in the one workstation but observed in the wider set up of the people's culture, workflows, and the way they work (Singh et al., 2020).

Due to the new way of doing things and internal processes that had to change, most skills were set to change. The electricity industry digital space introduced technologies which also required a digital mindset and digital capabilities and not just technicians or artisans; which became critical to how the organisation structures were set. Also, with business processes that were changing the type of roles required, skills had to go through a change. This again shows how DT impacts organisational structures. It is observed from the research finding that these changes were not specifically for one or a certain function, but ran across the entire organisation, even moving into the board structures

Comparing this to the literature it was found in the literature review that, an organisation needs to change and align its structure to the digital transformation strategy for successful implementation (Samimi et al., 2022; Singh et al., 2020). According to the literature, employee roles and skills change, and consequently organisational structural changes and traditional structures do not enable innovation (Morrison & Mota, 2021). This finding is supported by the literature review.

It was further found in Chapter 5 that most participants observed the introduction of new skills and or people who were skilled in the roles such as data base management, IA, data analytics (Singh et al., 2020). One key finding that was evident is the shift in the competencies required for engineers and electrical as in the traditional structure this role were very technically orientated for field work. With digital transformation there is a shift

in competencies such as digital mindsets, ethics and collaboration, and innovation, which are acumens supporting adaptability to digital transformation (Hanelt et al., 2021).

The finding concurs with literature that digital transformation impacts organisational structure in that employees must now have a digital mindset and therefore require upskilling and new skills development (Nadkarni & Prügl, 2021; Verhoef et al., 2021; Vial, 2019).

Digital transformation created a shift in organisational structures as new skills are required due to the need for efficiencies and process optimisation. This is addressed below.

### 6.3.5 Conclusive findings for theme 2

The research overwhelmingly identified that the introduction of digital technologies necessitates the drive for digital transformation and shifted organisational structures within the electricity industry but not at the same pace (Carton et al., 2023; Morrison & Mota, 2021). Findings disclosed how the modifications to reporting lines, team structures, and hierarchies to make them compatible with new digital processes and technologies demonstrated an evident impact of digital transformation on organisational structures. This is in line with the extant literature that found that digital transformation inherently modifies workflow processes which alters how teams are structured and at times alter the reporting lines and hierarchies for some organisations (Jayachandran et al., 2022; Von Oertzen, 2019; Vu & Hartley, 2022; Wang et al., 2022).

The research finding highlighted that not all changes are directly the same for the different organisations and across the entire industry. This concurs with the literature finding by Kraus et al. (2022) who argued that most organisations are either slow to adopt or those that adopt have not yet seen the results across all levels (Bouncken et al., 2021; Fitzgerald et al., 2013; Jayachandran et al., 2022; Warner & Wäger, 2019).

However, the research found that there are key emerging roles within the electricity industry such as data scientist, CDO, AI, and change management including AMI. Aligning the findings with literature review, academics concur that organisations may consider changing their structures to drive digital transformation (Jayachandran et al., 2022; Von Oertzen, 2019; Vu & Hartley, 2022; Wang et al., 2022). Literature further found that the ICT structure may also require changing from having hardware and information system teams to having teams consisting of analysts, programmers, and CDOs (Singh et al., 2020).

In comparison, the research found that the need to have a digital structure not directly within the ICT leg was critically observed and results show how vocal participants were on the ICT digital transformation drive across the wider organisation. And that ICT is mostly focused on implementing technologies and hardware. The finding disclosed the consideration to distinguish ICT as a pure network and technical infrastructure function and ICT that takes into consideration a digital transformation structure focusing on driving the DT across the wider organisation and not purely hardware and software (Singh et al., 2020) .

Because of the big overlay/cost of capital infrastructure for the electricity industry, the findings had differing views and did not expect the traditional hierarchical structures to change completely. But for some organisations the shift in roles and reporting line allowed combining some departments and or units (this was more observed in the transmission and distribution organisations). This concurs with extant literature where academics found that the traditional structures created inflexibility with digital transformation which then had a marginally slow impact on the hierarchical changes demanding more agile organisational structure formation than the traditional structures (Vial, 2019). The distribution organisations were more impacted in this regard. This led to a slow margin of responsiveness in adopting digital transformation in the electricity industry (on the distribution side) due to structures and high capital cost. This is supported by literature that posited that the introduction of digital technologies comes at a cost, for example the use of AMI has pushed electricity costs, fuelling outcry from customers (Verhoef et al., 2021).

One new finding is the interplay between leadership and leadership profiles, age and years of experience in promoting traditional structures vs having a leaner younger generations structure and how the interplay of these two generations leads to the adoption and impact of organisational structures. Findings also indicated that the industry did not experience the same type of changes as the adoption of digital transformation, given the type of organisations. But a general finding agreed that reorganisation of skill is crucial and is impacted by the introduction of digital transformation which thus impacts organisational structures. This is supported by Verhoef et al. (2021) arguing that, when introducing digital technologies, a margin of manual work is removed, informal and formal networks of working are formed and employees must be reskilled and or redeployed (Verhoef et al., 2021).

One key finding that was evident and concurs with literature is the shift in the competencies required for engineers and electrical skills as in the traditional structure

this role was very technically orientated for field work. With digital transformation there is a shift in competencies such as digital mindsets, ethics and collaboration, and innovation, which are acumens supporting adaptability to digital transformation (Hanelt et al., 2021).

A different perspective was further observed, namely that the lack of collaboration due to leadership trust also borders on legacy issues in traditional structures. Now literature posits that digital transformation creates informal and formal networks (Bouncken et al., 2021; Kraus et al., 2022), and this demands an understanding of the relationship between digital transformation and organisational structures (Hanelt et al., 2021; Verhoef et al., 2021). This ties in with findings of the research that digital transformation has the possibility to dismantle silos and encourage cross-functional teams collaborating on projects which is different from the traditional functional hierarchies in the electricity industry that encouraged silos. This was seen as a lack of sharing of information.

The findings concur with the literature findings that digital transformation impacts organisation structure in that the use of digital technologies necessitates a change in structures that support a digital drive. Therefore, requiring the adaptiveness and responsiveness of structures in adapting and embedding DT. This further creates a change in how employees are required to collaborate and integrate the way they work on a wider business scale due to changes in workflows and business processes and this in turn requires a change in skills requirements – necessitating new skills, roles, and the upskilling for digital mindsets (Petriglieri & Petriglieri, 2020).

The findings on how organisational structures are impacted are further developed and covered in the next section below as digital transformation is impacted through the accompanying change in workflow and business processes which necessitate process optimisation and efficiency.

### 6.4 Discussion of Theme 3: Process optimisation and efficiency

**RSQ3**: How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey?

**Theme emerged**: Process optimisation and efficiency.

This theme initially had four categories; however, it was thought best to combine controls and process efficiencies. Equally, operational instructions and efficiencies and reducing fault finding and response time were two separate categories, but they were combined

and named operational instructions and efficiencies. This was done to ensure a comprehensive and extensive coverage of the categories combined to limit repeat of the information.

Based on theory, digital transformation often involves the integration of technology into workflows and processes, which can lead to changes in how work is done and who is responsible for it. This can require changes to job roles, reporting structures, and decision-making processes and therefore impacting organisational structures (Feliciano-Cestero et al., 2023; Fitzgerald et al., 2013; Verhoef et al., 2021).

This supports the research finding which disclosed a deeper insight and perspective on business process optimisation as a factor that influences how digital transformation impacts organisational structures. A key finding from the research was that changes to process workflows, procedures, the controls in new guidelines as per the new technologies, coupled with enhanced productivity as a result of digital transformation all formed part of the emphasis of process optimisation and efficiency created from digital transformation and therefore not only impacted the electricity business model and the new way of doing things but it also impacted a change in organisational structures. Academics in literature elaborated on this indicating that businesses can identify and respond to new digital technologies and business models enabling value-creation paths (Samimi et al., 2022; Weill & Woerner, 2018).

With digital transformation the aspect of control was different and not as hierarchical or bureaucratic as in traditional structures. Thus, implementing digital transformation impacted how organisations exercised controls within the new way of doing business while trying to gain efficiencies in serving the customer better. This is supported by theory, as academics found that to master speed and collaboration, organisations must reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Traditional bureaucratic organisational structures that were considered to be rigid were not adapting well to new market conditions, which highlights the need to introduce new forms of organisational structure better suited to the demands of digital transformation (Mirković et al., 2019) .

Additionally, DT affected the organisational structure that enables DT, as process optimisation enhanced cross-functional collaboration, which in turn demanded response to DT adaptation for the right skills and digital capability. In contrast, participants said that the cross-functional solution, which was a technology enabler for optimisation, had the

potential to reduce the controls that were in place in a traditional structure, which was observed in the electricity industry. Therefore, impacting a change in a better fit structure.

### 6.4.1 Controls and process flow

The research finding demonstrated that the implementation of DT is expected to significantly impact the electricity industry controls by requiring a thorough review of processes and workflows for efficiency and better controls which was a challenge with traditional structure bureaucracies. This finding is in line with literature as academic authors found that digital transformation often involves the integration of technology into workflows and processes, which can lead to changes in how work is done and who is responsible for it. This can require changes to job roles, reporting structures, and decision-making processes and therefore impacting organisational structures (Feliciano-Cestero et al., 2023; Fitzgerald et al., 2013; Verhoef et al., 2021).

Digital transformation efforts aimed at streamlining processes and enhancing efficiency significantly impacted organisational structures. A key finding was that the controls that were put in place in the traditional organisational structures were altered by digital transformation and therefore altered organisational structures. This was because with DT there were significant changes or reviews in how workflows were effective and responsive to the digital changes. This concurs with the literature review study, in which it was found by academic authors that as digital technology focuses on the work setting, digital transformation anticipates the environmental changes across the organisation observed not only in the one workstation but observed in the wider set up of the people's culture workflows and the way they work (Singh et al., 2020).

Another finding was that due to integrated workflows, the controls were lessened but with real time monitoring in place as operations were now streamlined and everyone had access to platforms and the platforms had different controls which were much more efficient than the traditional controls. For example, in the traditional structures, controls were lagging in serving a customer, and by workflows being manual it took longer and at times only to find inefficiencies at output level or after output level. However, with DT, the platform controls were of such a nature that when the process was not carried out as per workflow requirement, employees were able to pick up immediately on diversions etc.

It was observed in the findings that the altered flow of processes transformed internal business processes as a result of DT and had an impact on workflow modifications. This further modified workflow instructions and controls.

Therefore, streamlining workflow as a result of DT was important for maximising efficiencies. Additionally, it improved service delivery and allowed the provision of additional services. The efficiencies brought about by DT further reduced the amount of time spent looking for faults and ensured that the prompting of systems and deviations were systematic. This in turn improved response and turnaround times because staff did not spend an excessive amount of time looking for faults, thus productivity improved.

When compared to the literature review, again authors emphasised that organisational structures were normally designed to take cognisance of the different tasks including the autonomy of rules and procedures required for various tasks (Hughes et al., 2015). Others further argued that organisational structures are informed by the unstructured tasks which involve organising, planning, coordination, and the level of interdependence which have an influence on what type of organisation is set for the corporate purpose (Morrison & Mota, 2021). This includes the type of organisation and the rationing between functional requirements and or interdependent requirements (AlNuaimi et al., 2022).

Therefore, organisational structures are conceptualised around functional requirements and interdepended requirements (Singh et al., 2020; Verhoef et al., 2021). In digital transformation, this has a fundamental setting of the business processes, the functions required, and the coordination at various levels and levels of decision making; scholars therefore argue that digital transformation creates structural changes which is in line with the findings (Carton et al., 2023).

However, with DT, controls were found to be exercised in real time monitoring and this was through the altering workflows, which was a significant observation among participants from the various expert groups and also found to be supported by theory. However, theory premised this from organisations' need to foster a culture that embraces experimentation, risk-taking, and continuous improvement, and that includes values such as collaboration, transparency, and customer-centricity (Li et al., 2018; Teece, 2007; Weill & Woerner, 2018).

The finding showed how digital transformation impacted organisation structure changes, but how the controls that came along with these structural changes also changed in that it was easier and more effective.

Findings further highlighted the interplay between efficiencies and quick response time as a result of DT impact on organisational structures which necessitated workflow alterations, which is also echoed by literature (Loonam et al., 2018).

Literature posits that the drive for digital transformation impacted organisational structures in that leadership now also had to alter the different workflows and reporting lines, and the controls were regarded to be more efficient and effective in real time due to the technologies introduced (Kraus et al., 2022).

When compared to the literature, it was found in the energy industry that the adoption of digital technologies enables more efficient operations, optimises energy production and distribution, and improves equipment monitoring and maintenance (Jayachandran et al., 2022; Oosthuizen et al., 2018; Vu & Hartley, 2022). Thus, the workflow alteration resulted in how instruction and efficiencies were improved again, giving a perspective on how digital transformation impacted organisational structures necessitated from workflow and business process optimisation (Bharadwaj, El Sawy, et al., 2013a). This then also impacted how operational instructions were carried out, as discussed in next section below.

### 6.4.2 Operational instructions and efficiencies

Literature has stated that digital transformation can create new roles and job functions that require different skills and expertise to support the digital initiatives and therefore impact the organisational structure (Morrison & Mota, 2021; Singh et al., 2020).

Findings in the previous section indicated that the implementation of digital transformation and workflow optimisation in organisations led to changes in reporting structures, team composition, duties, and accountability, necessitating effective monitoring especially in the technical operations. And findings showed that DT efforts aimed at streamlining processes and enhancing efficiency significantly impacted organisational structures. There was a consensus among participants that the controls that were put in place in the traditional organisational structures were altered by digital transformation and therefore altered organisational structures. This was because with DT there were significant changes or reviews in how workflows were effective and responsive to the digital changes.

Due to integrated workflows, the controls were lessened but with real time monitoring in place as operations were now streamlined and everyone had access to platforms and the platforms had different controls which were much more efficient than the traditional

controls. On the contrary, literature indicated that to achieve and master speed and collaboration, organisations had to reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Traditional bureaucratic organisational structures are rigid and may not adapt well to new market conditions, which highlights the need to introduce new forms of organisational structure better suited to the demands of digital transformation (Mirković et al., 2019). For example, in the traditional structures, controls were lagging in serving customers on cost estimates because the workflows were manual and it took longer and at times, the inefficiencies were only noticed at output level or after output level and when customers lodged complaints. However, with DT, the platforms controls were of such a nature that when the process was not carried out as per workflow requirement employees were able to pick up immediately on diversions, which was a clear impact on organisational structure changes.

Digital transformation efforts necessitate the review and streamlining of processes where the workforce is enabled to reduce the time looking for faults due to the system prompting automatically. The research finding that the way operational instructions were carried out supported the understanding of how digital transformation impacted organisational structure by giving insights into how operational instructions were now carried out.

Findings demonstrated the changes in reporting structures, team setups, or job responsibilities and obligations within the various organisations of the electricity industry. Therefore, implementing operational instructions and improving efficiencies through digital transformation had an impact on organisation structures and therefore also on how instructions were given and executed within the different operations (Morrison & Mota, 2021).

Research found that efforts from DT and workflow optimisation in their respective organisation had caused some shifts in reporting structures, team composition, or responsibilities and accountability (Morrison & Mota, 2021).

This compares with the research findings where a review in HR manpower was observed – in the past, HR would appoint clerks to do shortlisting with digital transformation but this was altered as the recruitment process was digitalised to prompt and shortlist, and the process was automatic and faster.

Another finding was the use of digital technology to implement operational instructions and improve efficiency as there was a noticeable reduction in spending time looking for

faults and the technologies introduced would have a system prompting aspect. But embedding digital transformation ultimately requires wider organisational change (Vial, 2019). This is because when introducing digital technologies, a margin of manual work is removed, and employees have to be reskilled and or redeployed (Verhoef et al., 2021).

### 6.4.3 Response time and fault finding

The research finding identified that digital transformation impacts organisational structure through the upskilling and reskilling of employees in the use of platforms which enhance fault finding and response times to customer and therefore creating customer experience; and this is supported by academics from the literature review who highlighted that customer value is noticeable with the use of digital technologies (Bharadwaj, El Sawy, et al., 2013a; Von Oertzen, 2019). The research findings concur that DT also impacts organisational structure in that the new way of working has enhanced efficiency by utilising digital tools to quickly identify faults, allocate resources, and expedite repairs, reducing downtime and labour costs. This was a big challenge in traditional structures, as found in literature, that issues such as centralised organisational structure, bureaucracy, and inefficiencies (marginally slowed down response and fault finding time) impacting how organisations embed the effectiveness of technologies as critiqued by scholars (Verhoef et al., 2021; Vial, 2019).

This finding aligns with the previous discussion and concurs with literature which found the change observed in implementing operational instructions through the use of digital technologies to improve efficiency and the research observed a noticeable reduction in the time the technical teams spend looking for faults as the platforms introduced would have a system prompting aspect (Morrison & Mota, 2021). Bringing it back to Vial's (2019) argument that embedding digital technologies for the wider organisation creates value networks that improve efficiencies due to improvements in quicker fault finding which in turn improves response time.

### 6.4.4 Conclusion Theme 3

In conclusion, the study found that the implementation of DT impacted organisation structure changes as DT required that processes and workflows had to be reviewed for efficiency. There was a general observation that this was happening and will remain a critical impact or change in the electricity industry.

A major finding was that inefficiencies existed due to electricians driving long distances to detect faults and repair them with traditional structures. But for those who had adopted DT, training the electricians to operate drones for line monitoring achieved a new level

of efficiencies. Technologies provided quicker access to the condition of the lines, identify faults, determine the necessary resources, and expedite repairs, reducing downtime and minimising labour costs which aligns with the literature findings (Morrison & Mota, 2021; Verhoef et al., 2021; Vial, 2019).

Additionally, based on the finding, the integration of digital systems and platforms in the network enhanced efficiency by pinpointing the exact location of faults, eliminating the need for time-consuming and manual troubleshooting processes. Ultimately, these measures not only optimised operational efficiency but also contributed to cost savings and improved service reliability in the electricity industry. This affirms the impact of digital transformation creating a shift in organisational structures necessitated by optimisation of workflow and processes which further improves decision making, and is supported by literature as mentioned above (Hughes et al., 2015; Singh et al., 2020).

The research found that implementing DT and optimising workflows and processes within resulted in alterations to reporting structures, team composition, duties, and accountability, which require effective monitoring. But a need exists for leadership to create self-organising teams by empowering employees for digital transformation and for the new way of doing work as a result of organisation structure changes.

As highlighted in the literature review above, an organisation needs to change and align its structure to the digital transformation strategy for successful implementation (Samimi et al., 2022; Singh et al., 2020). According to the literature, employee roles and skills change, and consequently organisational structural changes and traditional structures do not enable innovation and self-empowerment. This is further elaborated in the next section.

### 6.5 Discussion findings Theme 4: Empowering self-organising team

**RSQ4**: How does the business create and enable self-organising teams that are important for the realisation of digital transformation?

**Theme emerged**: Empowering self-organising teams for successful digital transformation subcategories.

The finding of empowering self-organising teams for successful digital transformation was a key theme under this research question. Three subcategories were found and discussed based on the participants' responses and insights. These were: addressing

employees' belief and perceptions, team autonomy and empowerment, ownership and accountability.

As demonstrated under theme 3, the research findings illustrate and tie in with the discussion under this theme in that digital transformation led to the creation of teams capable of working autonomously and making effective decisions within their work environments, without relying heavily on supervisors or managers, but effectively utilising the introduced digital technologies. The research finding highlighted the importance of autonomy as a vital factor for businesses to consider while implementing digital transformation which naturally impacts organisation structures. This is supported by the finding in literature (Nazari & Musilek, 2023), as discussed.

Key to this theme finding was that digital transformation established environments that empower employees rather than making them feel obsolete. Thus, this evolved changing employees' perspectives for the new roles and skills required. This finding concurs with theory that employee awareness, skilling and training were crucial for understanding and utilising new technologies and adapting to changes brought about by digital transformation (Hanelt et al., 2021). There is an agreement with the literature reviewed, but literature goes further to mention that according to Singh et al.'s (2020) study, digital transformation impacts structure through the centralisation concept. They argue that the type of authority exercised, the information that needs to be shared and how it is arranged is all linked to enhancing relationships and building collaboration among different levels of the organisation and therefore require coordination which is horizontal in nature. This is supported by Vial (2019) but who further emphasised the critical aspect of change management and involving employees to prepare and empower employees during digital transformation.

One important takeaway observation and a finding of significance was how the change in organisational structure necessitated through digital transformation enabled or required employees to take ownership of their jobs and working environment in the utilisation of digital technologies (Petriglieri & Petriglieri, 2020). This meant that employees had to be provided with autonomy within the space they were working in and thereby be able to take accountability not just on their key roles and task but also as a team. This finding provides nuance to what was found in literature from various academics that organisations may consider changing their structures that will drive digital transformation and provide more autonomy to functions (Jayachandran et al., 2022; Von Oertzen, 2019; Vu & Hartley, 2022; Wang et al., 2022).

Providing autonomy also meant that digital transformation led to increased integration across the organisation and thus created lean structures. This further emphasised the significance of employees within their organisations having to possess strong collaboration skills, excellent communication, and analytical and problem-solving abilities as found earlier by both literature and theory. And again, this had an impact on organisational structures and roles, requiring leadership to empower employees across the organisation so that they became innovative, making decisions using digital tools, and adapting to digital changes. This brings us back to the observation that technologies necessitate restructuring for agile organisational structure formation (and create employee empowerment) rather than the traditional structures known for low organisational autonomy especially on functional units (Dattée et al., 2022).

Therefore, findings concur with literature and an organisation's need to provide ownership, engage and include its employees in the digital transformation process from the beginning (Samimi et al., 2022). Hence, change management has to commence immediately. This means that the empowering of employees also signifies a shift in leading digital transformation by incorporating upskilling and creating new roles for employees. For example, in the finding observed earlier, employees could now focus on doing more analytical work than in the past when they had to do diagnostic work (Hanelt et al., 2021). This supports the finding that digital transformation can affect organisational structures through the integration of operations, combining structures, or creating matrix structures when empowering and creating autonomous teams and accountable roles for employees (Dattée et al., 2022). And doing this it also addresses the uncertainty and beliefs of employees, which is discussed next.

### 6.5.1 Addressing employee beliefs and perceptions

A key finding in the research was that digital transformation implementation impacted organisational structure, requiring effective management of employees' attitudes and beliefs. The findings advocated for employee forums for change management to drive a compelling vision for digital strategy and this is supported by Carton et al. (2023) who posit that leading change successfully is by crafting a compelling vision to what would be achieved with clarity. This might mitigate the finding from the research on resistance arising from employees who perceive digital transformation as job losses or who were not taken through the journey from the beginning when employees are provided with the big picture. Literature also found that digital transformation was aimed at streamlining processes to ensure effective integration of the organisation operating model. One key change that comes with digital transformation is the structural formation observant in the

people, business processes, structures, and culture (AlNuaimi et al., 2022; Singh et al., 2020). And this aligns with the finding that people are also impacted as they sit in these roles or structures that are changing. Therefore, strategies must be well thought through when implementing the necessary changes and the new way of work which in turn addresses employee beliefs and perceptions Samimi et al., 2022).

Literature posits that the DT-led disruptions demand change in business strategies (Rozite & Kamiya, 2022; Saunders & Lewis, 2017; Vu & Hartley, 2022) which reflect the increasing importance of technology in modern business (Kraus et al., 2022). However, the disruptive process creates a need for technology integration into overall business planning and therefore requires a wider digital transformation drive from an employee perspective and this is where effective change management is crucial (Fitzgerald et al., 2013; Singh et al., 2020; Vial, 2019).

This concurs with the research finding that the digital transformation strategy starts with bringing employees on board and putting them at ease regarding the necessary changes and explaining that the changes taking place are to address employee beliefs and perceptions and to avoid resistance.

The research finding pinned the importance of involving people and for management not just to implement initiatives with a top-down approach, especially since digital transformation has brought about structural changes impacting employee jobs, but perhaps also to consider what Dattée et al. (2022) suggested, namely to create autonomous teams and accountable roles for employees by bringing these employees along the DT journey (Vial, 2019).

This literature also aligns to the research finding that leadership have to come on board to breach the barrier of trust in the digital transformation process and how it affects the organisation structure. This brought in a different angle noting that the resistance comes from a lack of training in the new way of doing things, and leadership must therefore find strategies to change employees' perceptions and beliefs around digital transformation and the change in the organisational structures, which will require the coordinated effort from all employees which in turn will create an accepted long-term vision from everyone (Carton et al. (2023).

The research aligns with theory and found that leadership bears a critical role to address the perceptions and beliefs of employees, as the implementation of digital strategy impacted organisational structures due to the resistance it created. Organisations must

work on effective strategies to gain employee buy-in. Although literature had a broad view on resistance, academic authors' findings aligned with theory in that with the introduction of digital technologies, a margin of manual work is removed, and informal and formal networks of working are formed and employees must be reskilled and or redeployed to avoid their not buying in to the changes taking place (Verhoef et al., 2021). Reskilling, empowering and providing team autonomy are discussed below.

### 6.5.2 Team autonomy and empowerment

Literature posits that providing team autonomy has created ownership which enables employees to make decisions in the company's best interest, creating a good customer experience and setting organisations apart from competitors (Singh et al., 2020). The research found that the upskilling and involvement empowered team members with confidence created through lean structures and through the improvement of workflows and process optimisation and understanding of their roles and as mentioned previously, bringing the employees along on the journey.

According to the literature review conducted, one of the key considerations in executing strategy is to set up an organisational structure that will allow an organisation to meet its strategic objective (Samimi et al., 2022). Authors then indicated the importance of this forming of relationships across the organisations. And to do this, leadership must empower employees internally and externally with decision-making level and the ease on the span of control to enhance collaboration and meet customer service (Singh et al., 2020). The same is required when implementing digital transformation (Bouncken et al., 2021; Verhoef et al., 2021). Digital transformation can lead to the removal of hierarchical structures in favour of more flexible and responsive structures (Singh et al., 2020). This can involve the creation of cross-functional teams, the adoption of agile methodologies and business processes (Verhoef et al., 2021), and the empowerment of employees to make decisions and take ownership of their work (AlNuaimi et al., 2022; Kraus et al., 2022; Vial, 2019; Vu & Hartley, 2022). Because digital transformation requires innovation, work structures and activities also change resulting in the removal of some traditional roles which further necessitates a change in organisational structures and the incorporation of others (Singh et al., 2020). This concurs with the findings that DT necessitated empowerment and encouraging autonomy by involving and enabling teams to autonomously make decisions based on digitised information. The goal is to minimise micromanagement and enable teams to assume ownership of their activities and responsibilities (Dattée et a., 2022). Effective execution of digital transformation would

enable teams to leverage the knowledge and resources accessible to them via digitisation.

The finding concurs with literature that training, and awareness were essential to secure full commitment of all team members, since a lack of comprehension or reluctance towards digitisation might hinder its efficacy. It was critical to gain the support of individuals to comprehend the aim and advantages of digitalisation in order to efficiently leverage its possibilities and its impact on organisational structures (Verhoef et al., 2021; Vial, 2019).

### 6.5.3 Ownership and accountability

According to literature, the level at which decision making happens and autonomy is exercised is key and depends on the whether the task is a rule-based or output-based activity (Cosh et al., 2012; Singh et al., 2020). Digital transformation changed jobs and skills, accelerated decision-making, and empowered workers to own and be accountable for customer needs and driving business objectives to compete in digital market platforms (Panico & Cennamo, 2022). Thus, aligning to the research finding that DT transformed organisational structures and that change management, upskilling, and reskilling were needed to empower employees creating competitive advantage. The research therefore concurred to foster trust, autonomy, and accountability in most as employees did not rely heavily on the traditional way where ownership and accountability were mostly left to supervisors or managers (Dattée et a., 2022).

Although not explicitly detailed as a construct in the literature, the above is a component of the positioning of digital transformation, which academic authors posits, requires a culture that is open to change and innovation (Carton et al., 2023; Westerman et al., 2014). Organisations need to foster a culture that embraces experimentation, risk-taking, and continuous improvement, and that values collaboration, transparency, and customer-centricity (Li et al., 2018; Teece, 2007; Weill & Woerner, 2018). Therefore, DT requires organisations to rethink their structures, processes, and cultures to fully leverage the benefits of digital technologies (Vial, 2019). By doing so, they can create more agile, flexible, and responsive organisations that are better equipped to succeed in the digital age.

The independence of cross-functional teams and what would create an environment of embracing and inspiring an innovative culture through digitalisation have been studied but must be understood empirically (Bharadwaj, El Sawy, et al., 2013b; Feliciano-Cestero et al., 2023; Hanelt et al., 2021).

### 6.5.4 Conclusion Theme 4

Findings observed that digital transformation implementation affects organisational structure changes, necessitating effective management of employees' attitudes and beliefs on the new way of doing things. Thus, findings support offering employees forums where they could freely participate in change management during the implementation of digital transformation. Findings concurred that the impact on organisational structures or introduction of new roles and skills was mostly met with resistance by employees as they believed and perceived that digital transformation would render people's jobs obsolete.

The research also angled team autonomy and ownership and showed evidence that it enables employees' decision-making in the best interest of the company. This in turn creates a good customer experience and sets some of these organisations apart from their competitors (Vial, 2019). Participants also agreed that DT created lean structures and by empowering employees and giving them autonomy, it encouraged employees to feel supported by leadership where they had the freedom to make decisions confidently.

Digital transformation impacts the roles and introduces new roles and skills which led to faster decision-making processes and empowered employees to take ownership and thereby accountability of customer needs. Some participants emphasized through collaboration the importance of connecting customers immediately and dealing with any potential issues or consequences later, rather than waiting for executive approval which was mostly also enhanced through DT. Thus, participants agreed that DT impacts organisational structures which changed the way of doing things and it was important to create strategies to empower employees through change management, upskilling and reskilling. This in turn promoted a culture of trust, autonomy, and accountability within some of the participants' organisations.

## 6.6 Discussion on findings: ICT professionals

Professionals were information communication technology (ICT) or software professionals who have worked as executives or head of ICT in the electricity and utility industry. This group of participants were responsible for developing ICT and (for some) of the participants driving digital transformation strategies within the wider space of their organisations. The research findings concluded for this group provided insights focused on overall ICT functioning in the electricity industry as professional ICT executives.

As discussed under the discussion findings under the changing roles, the research finding in this group was that an island system existed as automation was driven and

managed from various business functions and therefore the data of the organisation tends to be dispersed across a number of different databases which is not integrated and centralised. The concept of centralisation emerged as a need to consolidate all of the data into a single source in order to achieve maximum utilisation of the digitalisation. The findings also concurred with the strategic imperative of ICT needing to be at an executive level and operate not just as an infrastructure provider but as a driver for strategic digital transformation. Due to the nature of their expertise the research finding also had a common agreement on the role of ICT that had to be fused in the digital space including the functionality split between information technology and the digital transformation initiatives that must be led by separate units. This is supported in the literature by Bharadwaj et al. (2013b) who found that the fusion of the ITC function into the wider organisation is critical in DT which impacted organisational structures and brought out the critical role that ICT plays in the dissemination of DT across the organisation. Singh et al. (2022) however expanded on this in his study stating that organisations had to critically consider the role of Chief Digital Officer within their structures to influence the drive for change and implementing digital transformation. Morrison and Mota (2021) call this the vertical dimension of influencing DT across the organisation. Thus, allowing not only the need for ICT to sit at executive level but introducing the role of CDO which separates from the traditional ICT structure into a digital transformation role that links and aligns IT to the business environment but from a change management and coordination perspective (Singh et al., 2022: Vial, 2019). Literature found that the CDO role is entwined with the chief information officer to ensure IT infrastructure is deployed successfully and innovation is encouraged (Carton et al., 2023; Singh et al., 2020).

This research finding supports the overall research finding linking it to theory and showing that the impact of digital transformation on organisation structures is evident. This is necessitated by the new requirement for both leadership and employees' digital knowledge. In order to assist the centralisation and digital transformation effort as well as the creation of systems and portals, the need for new skills emphasises the topic of skill acquisition and development within the digital space and therefore impacting organisational structures.

There was a new finding going beyond this specific research study in that the introduction of digital transformation impacts organisational structure in that it forces the business to change the way it operates, thereby changing the business model which requires a structure that follows the new business model. This is supported by the literature as

academics found that DT allows businesses to identify and respond to new digital technologies and business models enabling value-creation paths (Samimi et al., 2022; Weill & Woerner, 2018). The issue of business model was mentioned in the literature review but did not form part of a specific construct for the purpose of the research and hence will be a recommendation in the concluding Chapter 7 of the dissertation.

## 6.7 Discussion on findings: Human resource professionals

Findings were obtained from the human capital (HR) professionals who have worked as executives or head of human resources in the electricity and utility industry responsible for the strategic management of the human resource function including change management within their organisations. This group had a much wider perspective on different industries and was able to provide expert opinions on digital transformation not just in the electricity industry but also the mining and banking sectors which seem to be relatively more digitalised than the electricity industry in Namibia. The findings that came from this group did concur with the ICT professionals, but this professional group expanded the focus on change management and how leadership decision making is essential in putting the appropriate structures in place to embed digital transformation. Additionally, it was important to take into consideration how digital transformation projects affected the overall structure and design of the organisation and managing the people side of digital transformation (change management) which had a new key finding on the culture changes as impacted by the change in organisational structures. Compared to literature this is critical as academics found that digital transformation requires cross management transformation and coordination, (and proposing the CDO role) to drive and coordinate DT change not just in the business environment but from a perspective of change management (Vial, 2019). This literature also aligns with the research finding that leadership have to come on board to breach the barrier of trust in the digital transformation process and how it affects the organisation structure. This brought in a different angle noting that the resistance comes from a lack of training in the new way of doing things, and leadership must therefore find strategies to change employees' perceptions and beliefs around digital transformation and the change in the organisational structures, which will require coordinated effort from all employees which in turn creates acceptance of the long-term vision from everyone (Carton et al., 2023). Thus, the finding that change management is critical.

This professional group finding had a clear view that the current organisational structure had to be relooked to ensure it was in line with the goals of digital transformation, and if adjustments were required to ensure that the necessary balance and controls were put

in place. This was done by reviewing the reporting lines, team structures, and ensuring the creation of new roles or departments. Again, compared to theory, literature found that to master speed and collaboration, organisations must reduce hierarchical levels, decentralise decision-making (Morrison & Mota, 2021), and encourage greater collaboration among employees (Samimi et al., 2022). Traditional bureaucratic organisational structures that were considered to be rigid were not adapting well to new market conditions, which highlights the need to introduce new forms of organisational structure better suited to the demands of digital transformation (Mirković et al., 2019).

The above concurs with the finding from this professional group positioning this strongly especially in terms of the nature of their knowledge and the fact that HR is a support function and carries an intentional responsibility in finding that traditional structures are impacted by digital transformation although not at a fast pace.

Although the above finding was evident in the overall research, this professional group also expanded in taking caution that digital transformation's impact on organisational structure was more conservatively looking at balancing the reduction of manpower against job loses which translated into insight suggesting that digital transformation did have an impact on organisational structures; however, in the short run it was more about upskilling and reskilling and natural attrition. This is supported by literature were Samimi et al. (2022) agreed that organisations must make strategic moves in attracting employees who embrace digital competencies, and this could be through upskilling as much as also attracting new employees (Samimi et al., 2022).

Findings of this group observed the strategic HR view on the impact of digital transformation on organisational structures and how important it is to have the right structures in place and drive it with effective change management strategies, especially since change in workflow processes requires a review of the organisational structures due to digital transformation.

### 6.8 Discussion on findings: Electrical and renewable engineering professionals

This professional group were from participants who were more technically orientated electrical engineers, economist or renewable engineers. The research found that more participants fell into this group which was an interesting observation from the research findings (and from an industry structures perspective) – for the group of participants interviewed were mostly executive managers and CEOs in the electricity industry of

Namibia and they are more technically orientated. Two of the participants were CEOs, and both are professional engineers with vast experience in electrical and renewable energy.

The research findings from this group clearly indicated that the introduction of digital technology has sped up the process of digital transformation. Although the majority of the technologies that have been introduced into the technical sector have not necessarily led to an increase in revenue, they certainly have accelerated the process of introducing new technologies into the technical sector. But findings concurred with literature that this was happening at a very slow speed because the conventional methods of utilising power were producing the desired results. For example, Von Oertzen (2019) found that the electricity industry has seen a rapid increase in digital technologies being introduced into the utilities and further posits that the emergence of new technologies and the obsolescence of older equipment are often key drivers for organisations to undergo digital transformation (Bharadwaj, El Sawy, et al., 2013a). In the energy industry, the adoption of digital technologies can enable more efficient operations, optimise energy production and distribution, and improve equipment monitoring and maintenance (Jayachandran et al., 2022; Oosthuizen et al., 2018; Vu & Hartley, 2022).

This brings in the question of contrasting literature against the research finding as in how fast to digitalise or adopt new business models because, as indicative to the finding in the research, the Namibia electricity industry is able to make revenue from the conventional methods of utilising power. Thus, the finding is probing the further question of asking, do we need to go on a DT drive and do we need to change our organisational structures? I guess the finding will create a new debate in terms of how long the industry is able to have a competitive position given the drive from the Namibian government in accelerating digital transformation. As indicated under the literature review, the Namibian government has pronounced itself committed towards the acceleration and adoption of alternative energy mixes other than the traditional coal generated version and is pushing for a renewable agenda from a structural, economic, and socio-economic point of view, and as we know, renewables by nature require embedding digital transformation (Ministry of Mines and Energy, 2017a, 2017b).

However, research findings do position that the implementation of digital transformation was primarily carried out in isolation with the intention of improving a process rather than necessarily generating revenues. Consequently, the adoption of technology within the ESI organisation was slow, with a key factor that contributed to this being the high capital cost that is present within the industry. Irrespective, the research finding does concur

with literature that digital transformation impacts organisation structures and has necessitated the upskilling in skills, reskilling and change of traditional roles. And also, the finding can be contracted to keep an eye on what Ferrag and Maglaras (2020) posit, namely that blockchain is a tool for digital transformation that is becoming evident with the electricity grids globally and improving the use of smart grids.

## 6.9 Chapter 6 Conclusion

The research findings as compared to the literature study were methodically grouped into four main topics. The themes covered several areas of my research question in the interview process. The participants were also able to relate to the entire industry and provided key insights for the industry. A complete overview of the participants' insights and diverse perspectives on the theme subcategory was presented from which the findings were formed systematically to provide comprehensive findings to which the research was able to be linked back to the various themes from the research question and sub-questions. This also formed a systematic methodology in which the discussions were divergent and then converged to the theoretical affinity groupings. The findings were then systematically reviewed and contrasted against the literature review carried out in Chapter 2. Much of the theory was somehow lacking and there was a requirement to rework the literature to find and get comprehensive insight from the literature review perspective. It was found that there are quite a number of concurrences and similarities in the findings compared to the literature.

Before the conclusive summary was made for the research finding under Chapter 6, the researcher also found that the different research findings evolved through the different professional groupings of participants' lenses which at times revealed the interests or perspective among the participants based their backgrounds. Thus before the final summary is made, discussion findings are also presented to differentiate the key interest in the findings, as drawn in terms of professional grouping of participants, which provided different insights and responses based on their expertise areas and the alignment to theory.

These groupings were classified in three different areas, namely ICT background, participants with human resources background and individuals with technical backgrounds (electrical engineering/renewable/other support functions excluding HR and ICT). It must be noted that although these individuals were experts in their own areas, they are part of Top Management Teams, or Executive Team or report directly to the CEO within an organisation in the ESI industry.

To conclude the primary discussion of the research findings, similarities and differences between the discussion finding from the professional groups are incorporated and also aligned to the literature review and as observed have been further expanded and converged with the discussion of the overall research finding under the different themes in this Chapter 6.

However, as mentioned, a number of the research findings were quite new to the literature and might have to be recommended for further studies, which include the culture of an organisation, leadership digital mindset as a driver of digital transformation requiring a change in the business model for the Namibian electricity industry.

Below is the **conclusive overall summary of the research finding** as it contrast to and concurs with literature, concluded under the four theoretical themes:

Theme 1: Digital technology as a driver of digital transformation

The finding concludes in this theme provides evidence on the role that digital technologies play in digital transformation which significantly impacts the electricity industry's effective implementation of digital transformation. The research finding acknowledges that the integration of tools, systems, and platforms accelerates digital transformation and enhances organisational structures.

The research further found the Namibia electricity industry's use of digital technologies fundamentally changes businesses operations, can deliver value to customers, and these changes can be extended to the changes in organisation structure.

However, slow adoption was found to be evident as a result of the technologies implemented in isolation.

The finding concludes and also suggests that there are other drivers such as global and market and industry developments of DT and suggests that Top Management must understand how critical firm use of digital technologies creates competitive postures through agility and integrating technologies with the overall organisation, given the drive for the improvement in customer service provision. This further links the finding where the use of technologies requires taking cognisance of the organisational aspect of people and strategically bringing them on board to buy in the DT strategy. This is suggested as first employing change management as a strategic planning tool to enable the adoption of digital transformation.

The findings are supported by various academic authors concluding that digital technologies create value paths in the form of customer value propositions and digital channels and agility, and this necessitates digital transformation which can only be realised with marginal changes in organisational structures. The concluding findings on how organisational structures are impacted are covered in the next section below.

Theme 2: Digital transformation and organisational structures

The research overwhelmingly finds and concludes on the primary research question, in that the introduction of digital technologies necessitates digital transformation, shifting organisational structures but not at the same pace and not all changes are directly the same for the different organisations and across the entire industry. Key concluding finding is that the industry adoption is slow and hampered by the traditional structures' inflexibility.

However, the research further found that there are key emerging roles within the electricity industry such as data scientist, CDO, AI, and change management including AMI. But conclusively the ICT structure may also require changing from having hardware and information system teams to having teams consisting of analysts, programmers, and CDOs (Singh et al., 2020).

This also supports the finding in that there is a shift in the competencies required for engineers and electrical skills including digital mindsets, collaboration, and innovation, which are acumens supporting adaptability to digital transformation ultimately requiring a change in organisational structures.

The electricity industry shifts findings are that the traditional hierarchical structures will not shift fast due to the high cost of capital evidenced. But some organisations may experience a shift in roles and reporting line to combining some departments and or units (this was more observed in the transmission and distribution organisations).

However, findings disclosed how the modifications to reporting lines, team structures, and hierarchies may be evident due to digital processes and technologies.

Digital technologies remove a margin of manual work, creating informal and formal networks of work requiring reskilling and deployment.

Therefore it is concluded that collaboration is a critical finding, with DT creating informal and formal networks, and able to dismantle silos and encourage cross-functional teams collaborating on projects which is different from the traditional functional hierarchies in

the electricity industry that encouraged working in silos. This was seen as a lack of sharing of information.

The findings concur with the literature findings that digital transformation impacts organisation structure in that the use of digital technologies necessitates a change in structures that support a digital drive. Therefore, requiring the adaptiveness and responsiveness of structures in the adapting and embedding DT. This further creates a change in how employees are required to collaborate and integrate the way they work on a wider business scale due to changes in workflows and business processes and this in turn requires a change in skills requirements of new skills, roles, and the upskilling for digital mindsets.

The findings how organisational structures are impacted are expanded and covered in the next section below as digital transformation is impacted through the accompanying change in workflow and business processes which necessitate process optimisation and efficiency.

Theme 3: Process optimisation and efficiency

In conclusion, the study found that DT impacted organisation structure due to workflow reviews which in turn created efficiency, improving responsiveness and adaptability to the DT agenda (compared with traditional structures) where inefficiencies existed.

Additionally, based on the finding, the integration of digital systems and platforms contributes to better decision-making which improves service reliability translating to cost savings in the electricity industry.

The research concludes that implementing DT and optimising processes results in accountability, as it improves the process of fault finding and therefore creating self-organising teams through empowering employees for digital transformation and for the new way of doing work as a result of organisation structure changes.

The finding concludes that digital transformation impacts organisation structure through process optimisation, workflow upskilling, accelerating responsiveness which promotes innovation and self-empowerment as employees are brought along the journey. This is further elaborated in the next section.

Theme 4: Empowering self-organising teams for successful digital transformation

It is concluded that digital transformation implementation affects organisational structure changes, necessitating effective management of employees' attitudes and beliefs in the new way of doing things.

Thus, the finding concludes the importance of providing employees with open forums to understand the changes taking place. It removes the perception of employee fear of DT making their jobs obsolete and therefore resisting the DT.

The finding also concluded how team autonomy and ownership encouraged better decision-making in the best interest of the company. Thus, the change in structure for DT must enable autonomy for empowerment.

Digital transformation impacts organisational structure in that it introduces new roles and skills, enabling faster decision-making and employee accountability and solves customer problems because trust is built through the upskilling and reskilling and taking employees on a journey of change.

## CHAPTER 7: CONCLUSION

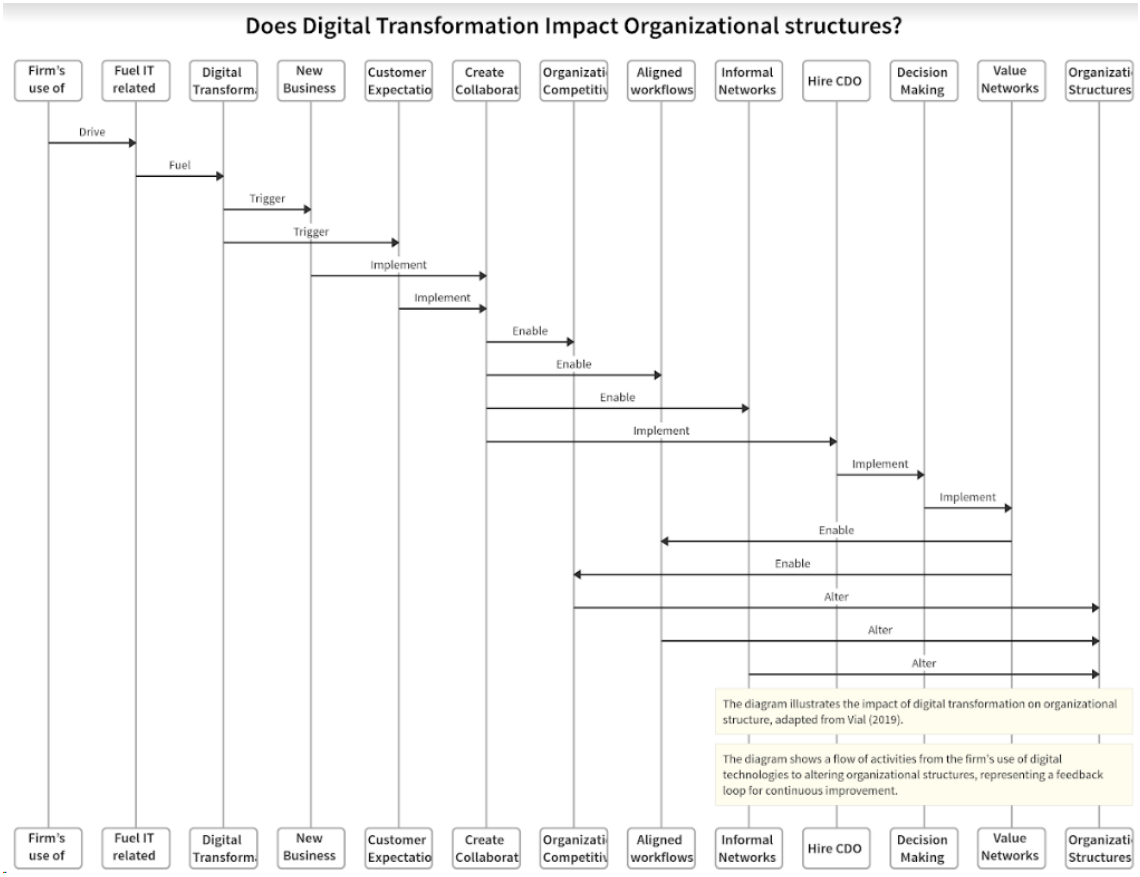
### 7.1 Introduction

This qualitative research was undertaken to study how digital transformation impacts organisational structures in the electricity industry of Namibia. Although the Namibian industry has been slow in digital transformation, the interplay in the introduction of digital technology has had an impact on the majority of organisations in the electricity industry and the overall industry itself. Also, the huge capital cost required in the electricity industry has bearing on the rate at which organisations embed digital transformation within their organisation. Findings are that digital transformation does have an impact on organisation structure in that there is a shift observed in terms of the different positions.

### 7.2 Principle findings

**Figure 3**

*Revisit conceptual diagram*




*Note*. Sequence diagram populated from research data

The following principle findings were identified from the research:

The role that digital technology plays in digital transformation significantly impacts the electricity industry in the effective implementation of digital transformation. The integration of tools, systems, and platforms accelerate digital transformation and enhance organisational structures (Vial, 2019).

The research further found the Namibia electricity industry's use of digital technologies fundamentally changes businesses operations, can deliver value to customers, and these changes extended to the changes in organisation structure (Bharadwaj, El Sawy, et al., 2013b; Singh et al., 2020).

Slow adoption is evident as a result of the technologies implemented in isolation .

Global market and industry developments of DT demands organisations to position themselves for relevance. The use of technologies requires taking cognisance of the organisational aspect of people and strategically bringing them on board to buy in the DT strategy. This is suggested as first employing change management as a strategic planning tool to enable the adoption of digital transformation (Samimi et al., 2022).

The findings are supported by academic authors concluding that digital technologies create value paths in the form of customer value propositions and digital channels and agility, and this necessitates digital transformation which can only be realised with marginal changes in organisational structures (Hanelt et al., 2021).

The finding concludes on the primary research question, in that the introduction of digital technologies necessitates digital transformation, shifting organisational structures but not at the same pace and not all changes are directly the same for the different organisations and across the entire industry. The key concluding finding is that the industry adoption is slow and hampered by the traditional structures inflexibility (Kraus et al., 2022).

The research supports the academic findings on roles that are emerging within the electricity industry such as data scientist, CDO, AI, and change management including AMI. Further supporting the conclusive position of theory that the ICT requires changing from hardware and information system teams to having teams consisting of analysts, programmers, and CDOs (Singh et al., 2020).

This also supports the finding in that there is a shift in the competencies required for engineers and electrical skills including digital mindsets, collaboration, and innovation, which are acumens supporting adaptability to digital transformation, ultimately requiring

a change in organisational structures (Hanelt et al., 2021; Morrison & Mota, 2021; Verhoef et al., 2021)

The electricity industry shifts findings are that the traditional hierarchical structures will not shift fast due to the high cost of capital evidenced. But some organisations may experience a shift in roles and reporting line to combining some departments and or units (this was more observed in the transmission and distribution organisations).

However, findings disclosed how the modifications to reporting lines, team structures, and hierarchies may be evident due to digital processes and technologies.

Digital technologies remove a margin of manual work creating informal and formal networks of working that requires reskilling and deployment.

This requires collaboration due to the creation of informal and formal networks, dismantling silos and encouraging cross-functional teams to collaborating on projects– this was found to be different from the traditional functional hierarchies in the electricity industry that encouraged working in silos (Feliciano-Cestero et al., 2023).

The findings concurs with the literature findings that digital transformation impacts organisation structure in that the use of digital technologies necessitates a change in structures that support a digital drive. Therefore, requiring the adaptiveness and responsiveness of structures to adapt to and embed DT. This further creates a change in how employees are required to collaborate and integrate the way they work on a wider business scale due to changes in workflows and business processes and this in turn requires a change in skills requirements necessitating new skills, roles, and the upskilling for digital mindsets (Bharadwaj, El Sawy, et al., 2013a; Verhoef et al., 2021; Vial, 2019; Westerman et al., 2014).

This in turn also necessitate workflows reviews which in turn creates efficiency improving responsiveness and adaptability to the DT agenda (compared with traditional structures) where inefficiencies existed (Singh et al., 2020).

Additionally, based on the finding, the integration of digital systems and platforms contributes to better decision-making which improves service reliability, translating to cost savings in the electricity industry.

The research concludes that implementing DT and optimising processes results in accountability, as it improves the process of fault finding therefore creating self-

organising teams through empowering employees for digital transformation and for the new way of doing work as a result of organisation structure changes (Carton et al., 2023).

The finding concludes that digital transformation impacts organisation structure through process optimisation, workflow upskilling, accelerating responsiveness which promotes innovation and self-empowerment as employees are brought along the journey. This is further elaborated in the next section (Morrison & Mota, 2021; Singh et al., 2020).

Empowering employees for digital transformation implementation affects organisational structure changes, necessitating effective management of employees' attitudes and beliefs in the new way of doing things.

Thus, the finding concludes the importance of providing employees with open forums to understand the changes taking place. It removes the perception of employee fear of DT making their jobs obsolete and therefore resisting the DT.

The finding also concludes how team autonomy and ownership encourage better decision-making in the best interest of the company. Thus, the change in structure for DT must enable autonomy for empowerment (Feliciano-Cestero et al., 2023; Fitzgerald et al., 2013; Verhoef et al., 2021).

Digital transformation has an impact on organisational structure in that it alters the way business is conducted and therefore necessitates a change in organisational structures.

The research found that traditional structures are not responsive in terms of innovation and agility required from the exponential and rapid changes caused by and required for effective digital transformation implementation. The drive for digital transformation is a leadership agenda and must form part of the wider strategic imperative of companies with an intentional strategic placing at board level. Leadership must have a digital mindset and acumen to  be able to drive digital transformation.

### 7.3 Research contribution

The research explored how digita transformation impacts organisation structure in the Namibian electricity industry. The research contributes widely to an academic gap that is currently observed in terms of the limitation or lack of findings in how digital transformation impacts organisational structures (Hanelt et al., 2021; Verhoef et al., 2021).

The research explored this scholarly gap, as identified by academics and practitioners, in order to determine the impact of digital transformation on organisational structure (Verhoef et al., 2021) and add to the understanding of how digital transformation impacts organisation structure, with findings supported by theory and factors at play in how DT transformation impacts organisation structures.

Academics agree that no extensive empirical studies have been done on this concept which helps to create empirical evidence of organisational structures that are most effective for digital transformation (Singh et al., 2020; Vial, 2019).

The research contributes to this in showing digital transformation impacts organisation structure as necessitated by: the role of technology as a driver of DT, the finding outcomes in how structures are changed in shape and form, necessitating workflow and business process optimisation and ultimately creating strategies in upskilling and reskilling employees (empowering employee), and creating structures that are fit for digital transformation.

### 7.4 Business recommendation

Digital transformation is a disruptive phenomenon, and it impacts organisational structures in that it requires an organisation-wide integration of the business in the way business is run to deliver customer value and to remain competitive (Vu & Hartley, 2022

Therefore, the below recommendations are made to the business.

Firstly, business must ensure that they do not introduce digital technologies in isolation, or as islands but must ensure that they push an organisational integrated drive for digital transformation (Vial, 2019).

Secondly, business must review and update the ICT structure to be responsive to the digital transformation goals within the respective organisations. This also includes considering reviewing and improving the role of ICT and digitalisation at executive level because digital transformation impact on the electricity industry is for real. DT has shown that the roles and skills required for the digital world are changing due to the need to be agile, responsive, and innovative, which shows how DT impacts organisational structure and must be able to provide ownership to employees (Panico & Cennamo, 2022). So, organisations must relook their reporting structures and team compositions, emerging roles. Business must also review their workflow and business processes which requires more collaboration. Therefore, the creation of cross-functional teams to drive the

strategies of digital transformation is important especially from different teams and different skills backgrounds. Investment in upskilling and reskilling must be prioritised for employees in order to prepare them for digital knowledge. This will help with employee empowerment given to employees Hanelt et al., 2021; Kraus et al., 2022, Singh et al., 2020).

Another critical recommendation to put in place is change management for the journey of digital transformation is critical and this must be done from the beginning to provide employees with ownership (AlNuaimi et al., 2022; Feliciano-Cestero et al., 2023). This will also help with the resistance from employees and allow employees to accept change and thus also provide best customer service.

Lastly, leadership is the driver of digital transformation and must foster a digital mindset coupled with dynamic capabilities and create the right culture that will embrace not just new organisational structures but also adapt to the disruptive changes that are brought about by digital transformation (Dattée et al., 2022; Carton et al., 2023; Samimi et al., 2022; Westerman et al., 2014).

### 7.5 Limitation of study

Although a pilot interview was done, the researcher was a novice in undertaking this research and observing a key issue especially in terms of the responses provided during the interviews, which required having to repeat some of the questions considerably. This provides a situation of either the participants not understanding the digital transformation in principle due to lack digital mindset, or the research questionnaire format being complex. The questions were subsequently elaborated and simplified with key sub-questions and additional questions during the interviews. These additional questions were semi-structured.

Secondly, the industry and participants were selected purposefully which might have created a bias in terms of applying the study fully to the industry. Also, there is a vast difference between the types of organisations in which the participants operate (especially in terms of revenues), and this had an impact on the level of adoption as some organisations geographically had a better economic advantage than in other regions. This means that cost and revenue were marginally different and may have a substantive impact in the adoption of technology. This was also seen in terms of the structural changes observed where those organisations with a better asset base had significant or notable digital transformation strategies.

## 7.6 Future research

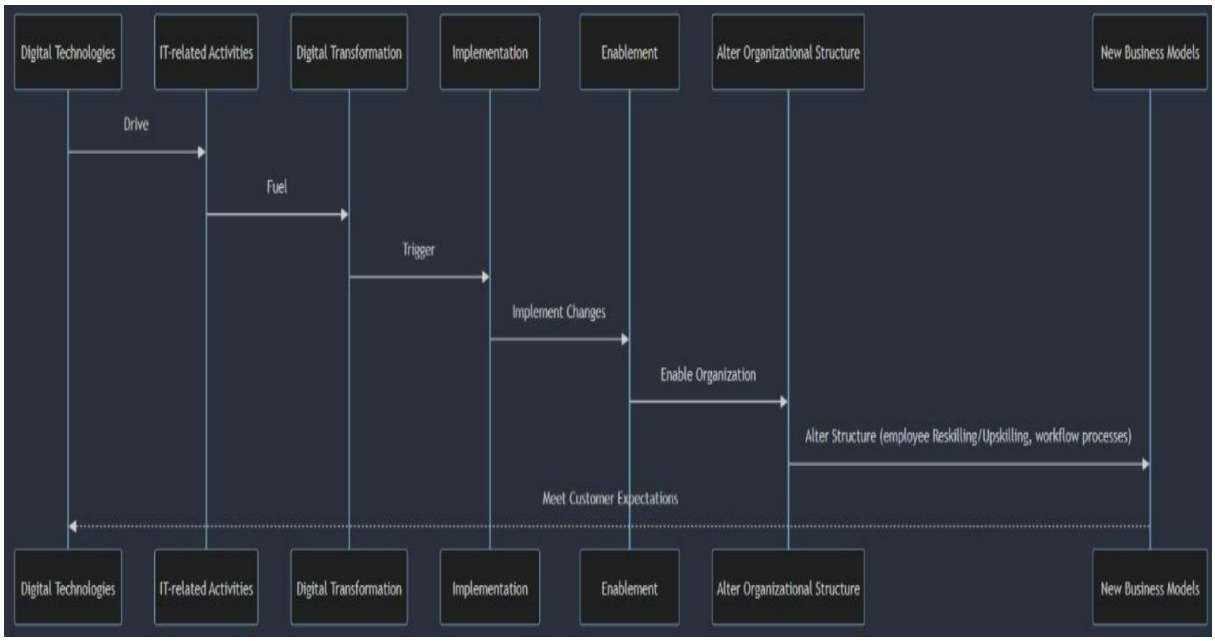
Future research that could be conducted is terms of leadership capabilities that are fit to drive digital transformation and the impact of culture in driving digital transformation is critical and must be a future area of interest.

For the electricity industry, the position of the industry and competitiveness of the distributor, given the regulatory space in terms of its sustainability, must be a key interest of study and how digital transformation impacts change in a business model. Therefore, this study proposes that future research conducts an empirical study to see how the introduction of DT has changed structures and how it also changes business models or how this has improved competitiveness of the Nambian electricity industry vs other industries such as the mobile industry that is now becoming an ecosystem and starting to compete against the electricity industry due to platforms and blockchains that are coming through.

Figure 4 is an example of the proposed loop for future business model research with the arrow returning and starting from the new business model.

**Figure 4**

*Suggested future research area for BM*




*Note*. The suggested future research is the return loop from the right to the left. Sequence diagram populated from research data

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## APPENDICES

### Appendix 1: Consistency Matrix

**APPENDIX 2: CONSISTENCY MATRIX**

| NO | RESEARCH QUESTIONS and/or | Literature review | LITERATURE REVIEW (Please include specific paragraph | DATA COLLECTION TOOL | DATA ANALYSIS |
|---|---|---|---|---|---|
| 1 | How do organisations align their structure for a digital transformation journey? | Digital transformation as a response to digital technologies | 2.1 to 2.3/2.7/2.11 | Semi structured interview questionner. Will form part of the questions on questioner | 4.8/4.9/5/6 |
| | | Definition of digital transformation | 2.7/2.9 - 2.9.2/2.9.3 | Semi structured interview questionner. Will form part of the questions on questione | 4.8/4.9/5/6 |
| 2 | How does the business create and enable self-organizing teams that are important for the realization of digital transformation | Organisational structure and alignment, Evolution of organisational structures,Creation of technology workflows across the organisation, Elements of organisational structures, Academic gaps in DT and organisational structure | 2.5/2.7/.2.8/2.9.10 | Semi structured interview questionner. Will form part of the questions on questione | |
| 3 | What is the impact on organisational structure post/during the digital implementation journey? | Organisational structure – a conceptual definition, Creation of new roles and job functions – Digital transformation, Creation of technology workflows across the organisation | 2.3/2.6/2.7/2.8/2.9/2..10/2.11 | Semi structured interview questionner. Will form part of the questions on questione | 4.8/4.9/5.9 |
| 4 | How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey | Value networks effect organisational structures , Creation of technology workflows across the organisation, Digital transformation in the electricity industry | 2.8/2.9/2.10/2.11 | Semi structured interview questionner. Will form part of the questions on questione | |

## Appendix 2: Draft Questionnaire expanded on the Primary research question and sub-questions

| | | |
|---|---|---|
| **PART A** | **Thank you for your participation in this interview. I have purposefully choosen you to participate in this interview due to your experience and knowledge in the subject matter and drawing rich and meaning insights from you. This section will take time to find out about your demographics. And as consent in letter this data will not disclose your identity and will be anonymised.** | |
| DMG1 | What is your Level of Work | |
| DMG2 | How many year of experience do you have overral career | |
| DMG4 | What is your current role | |
| DMG5 | How many years experiecne do you have in your current role indicated | |
| **PART B** | **The next questions are based on your perception and work experience to enable me to get understanding** | **Subquestion to find answers and or explore** |
| **Que1** | How do organisations align their structure for a digital transformation journey? | **Subquestion to - Who is/was/will be in charge of the driving digital transformation and why?** |
| | | How is the role of IT is fusioned with the overral organisation for digital transformation to be successful |
| | | How slow is the electricity industry in adopting digital transformation |
| | | How do digital technologies trigger organisations to adopt digital transfomation |
| | | Do Executive need to have a digital mindset and dynamic capabilities to impact digital transformation |
| | | What different roles of coordination is at play during the introduction of DT |
| **Que2** | What is the impact on organisational structure post the digital implementation journey? | **Subquestion to - Do you plan to integrate new operations into existing structures or create separate entities or new hierarchy levels?** |
| | | How did/does the hierarchical levels of organizational structure change with digital transformation? |
| | | How have the roles and skills in the organisation changes with the introduction of DT, |
| | | What dimension are at play during digital transformation and how do they impact organisational structures? |
| | | how does digital technologies adopted in the Electricity Industry creates shift in the organisational structures |
| **Que3** | How do businesses balance controls and efficiencies within existing structures to realise value from the digital transformation journey? | **Subquestion to - How will the introduction of technologies influence existing business interactions? What type of operational changes do you expect? Have you experienced?** |
| | | How important to balance agility with the need for control and efficiency during digital transformation |
| | | How do business Process and workflows change and are recreated during digital transfomation |
| | | What dimension are at play during digital transformation and how do they impact organisational structures? |
| | | How do transforming firms benefit from new organizational structures and management styles |
| | | Digital technologies create value paths and therefore require digital transformation focus through the organisation |
| **Que4** | How does the business create and enable self-organizing teams that are important for the realization of digital transformation? | **Subquestion to - Do you need to acquire new competencies? If so, how do you plan to acquire them and how will they influence the traditional structures?** |
| | | What do you think what organizational structures are most effective for digital transformation |
| | | How have the introduction of digital technologies reduced impact on manpower |
| | | How does digital transforming benefit from new organizational structures and management styles |
| | | **Subquestion to - What networks are created in the implementation of digital transformation?** |
| | | What network effects (informal/formal) created during digital transformation |
| | | How did your oganisations construct self-organizing teams to attain digital transformation |

## Appendix 3: Participant Informed Consent

**Informed Consent by Interview Participant**

I am conducting research on ***Digital Transformation in the Energy Industry***.

Our interview is expected to last *no longer than an hour*, and will help us understand, ***How do digital transformation impact organizational structures***. Our interview is confidential and no personal information or organisational information will be disclosed.

**Your participation is voluntary, and you can withdraw at any time without penalty**.

By signing this letter, you are indicating that you have given permission for:

a) The interview to be recorded.

b) The recording to be transcribed by myself.

c) Verbatim quotations from the interview may be used in the report, provided they are not identified with your name or that of your organisation to keep confidentiality.

d) You can withdraw at any time without penalty and no financial benefit is provided in partaking in this research.

e) Your participation is anonymous and only aggregated data will be reported.

f) The data to be used as part of a report that will be publicly available once the examination process has been completed; and

g) All data to be reported and stored without identifiers.

If you have any concerns, please contact my supervisor or me. Our details are provided below.

Researcher name
Email: 22029657@mygibs.co.za
Phone: 0812011994

Research Supervisor name
Email: tondemadziva@gmail.com
Phone: +27 65 991 0498

Signature of participant: _____

Date: _____

Signature of researcher: _____
Date: _____