An analysis of the execution of digital transformation strategy in a large petrochemical organisation in South Africa

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Abstract

This research paper explored the implementation of digital transformation strategies in a South African petrochemical organization, focusing on the challenges, facilitators, and best practices for successful execution. The study sought to identify common pitfalls in digital transformation success, and solutions to overcome such. The methodology used in this study, which involved qualitative interviews with relevant stakeholders, was deemed appropriate for exploring the subjective experiences and perspectives of the interviewees on strategy execution. A sample population of 12 interview candidates were identified for their expertise and experience in digital transformation and digitisation implementations. The specific population of senior management and digital consultants responsible for interpreting digital transformation strategies was considered relevant and provides a targeted focus for the research objectives. A qualitative analysis tool *Atlas. ti* (Version 22) was used to analyse the data and derive codes and themes, which formed the basis of the findings and recommendations made in the research paper. The study revealed the importance of strategy execution in the petrochemical industry and identified key barriers and facilitative factors, which included end-user buy-in, resource allocation and executive support factors. The findings of this study reiterated the need for tailored strategies and approaches to implementation, as well as the importance of end-user buy-in and change management. Building on the insights gathered from the research, this paper proposed a framework for successful digital transformation execution, consisting of six interrelated factors: organisational approach, end-user buy-in, tailormade solutions, innovation, experimentation, and change management. The framework could guide organisations in executing their digital transformation goals more efficiently and effectively, taking into account the unique context and challenges faced by the petrochemical industry in South Africa. Overall, this paper highlights the importance of effective strategy execution in digital transformation initiatives, particularly in the petrochemical industry in South Africa. The proposed framework offers a practical guide for organizations seeking to achieve their digital transformation goals while contributing to the broader conversation around digital transformation strategy and execution.

Keywords: Execution; digital transformation; strategy; petrochemical organisation

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements of the degree Master of Business Administration at the Wits Business School, University of the Witwatersrand. It has not been submitted before for any degree or examination in any other university. I further declare that I have obtained the authorisation and necessary consent to conduct this research.

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Dedication

I would like to thank God for giving me the strength and perseverance to complete this research paper. I would like to thank and show gratitude to my supervisor Dr. Fanny Saruchera for his support and guidance during this research process. I appreciate his time and feedback to enable me to complete this research paper. I would also like to thank my loving parents (Godfriedt and Ruth Billett) and my brothers (Gershwin and Bradley Billett) for their unwavering belief and their support throughout my MBA. Lastly, I would like to thank my partner and soon-to-be wife (Ashton Prinsloo), for being my pillar of strength and providing the motivation to continuously push myself.

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CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

According to Wei, Alias and Noche (2019) technology innovation greatly disrupted industries world-wide, pushing industries to transition to a more sustainable way of conducting business activities. In addition, the disruptive potential of digital innovation results in substantive industry change with socio-economic consequences (Sandkuhl, Shilov & Smirnov, 2020). Thus, in its simplest formula, digital transformation transforms information, processes, products and services into a form that is enhanced by technology (Zimmermann, et al., 2016). According to Jonasson and Siwert (2019), digital transformation strategy became important to grow and adapt to the current digital innovation landscape. Therefore, leaders need to adopt the right strategy to ensure the survival of an organisation (Bell, Dean & Gottschalk, 2010). Strategy execution is critical, as a failed attempt to execute a strategy can lead to opportunities lost. Furthermore, the lack of execution creates further difficulties in maintaining priorities and reaching strategic goals (Ranjbar, Shirazi & Blooki 2014). Therefore, to ensure the organisation's goals and success in achieving their audacious strategies, they need to carefully manage the activities and tasks around the implementation of a strategy (Getz & Lee, 2011).

This paper explored the implementation of digital transformation strategies in a South African petrochemical organization, focusing on the challenges, facilitators, and best practices for successful execution. This chapter presents the background to the study, problem statement and lays out the study's objectives, among other key issues.

1.2 Background to the study

The organisation used for this study is a global chemicals and energy company that specialises in manufacturing fuels and chemical products. The organisation, whose name cannot be disclosed ethically, manages the marketing and sales of oil, gas and electricity products in Southern Africa. While also having joint ventures in manufacturing plants in Qatar, United States of America, Germany and China. This case study organisation is in 18 countries specialising in producing alumina, catalyst, polymers, and fertilisers. This company was examined to view the strategy decisions taken to help improve their customer service, improve relationships with their services

providers and suppliers, increase sales, improve marketing and provide customers with a personalised experience. This allowed the company to be in a more competitive position against its competition. This research paper highlights the importance of strategy execution in the petrochemical environment, highlighting barriers and facilitative factors identified in the data analysis section. Strategy execution is a blueprint for strategy formulation, ensuring viability and determining the success of digitisation projects. According to de Oliveira, Carneiro and Esteves (2018), strategy execution is the activities and the decisions made for the execution of a strategic plan.

The literature consulted addressed the topic of strategy execution within a petrochemical company on a global front, as well as local and region research done. This study could contribute to the body of knowledge on digital transformation strategy and allow for a greater understanding of strategy execution in a South African context. In addition, the thematic approach used was a qualitative study which included interviews with top management and other individuals in the company. Their views on strategy execution and its impacts on strategy implementation were studied. The findings from these interviews have been analysed against past research, which has been conducted internationally, regionally and from a local perspective. The views and insights gained from this study allow for a better understanding of digital transformation strategy. The results formed the recommendations and framework to enhance the execution of digital projects.

1.3 Context of the study

The South African organisation was analysed, and various strategy implementation methodology approaches were used. Executing digital transformation strategies requires an organisation to design an approach to implementation. Li, Guohui and Eppler (2008) highlighted three key system approaches to strategy implementation. A centralised approach to creating tactical level capability through managerial philosophy, coordination and organisation structure configuration. Furthermore, the approach emphasised the inner locus of control, focusing on the interdepartmental relationships and managerial and operational levels. The second key system approach is the decentralised approach which incorporates external partners that provide knowledge and build competency within the organisations to achieve strategic projects. Lastly, the budget evaluation approach is where organisations pursue low-

cost implementations to maximise competitiveness and short-term earnings (Li, Guohui & Eppler, 2008).

As an organisation moves into a more turbulent and fast-moving environment, some approaches and frameworks provide managers with useful techniques and recommendations for strategy implementation (Heracleous, 2000). In addition, these tactical approaches can ensure an effective implementation depending on the particular context of a strategic initiative. As Li, Guohui and Eppler (2008) indicated, different strategies must be implemented differently. Hrebiniak (2013) indicates strategy execution is a disciplined process of logical sets of joined activities that allows an organisation to make a strategy work. In its simplest form, strategy execution is placing strategy into action (Katoma & Ungerer, 2011). Strategy execution is interpreted in various ways, but researchers tend to reference actions and activities related to strategy.

The purpose of this study is to contribute meaningfully to the research on strategy execution in digital transformation, specifically within the petrochemicals industry in the Southern African context. The study aims to fill the existing gap in literature by exploring the details and challenges of executing digital transformation strategies in this industry, providing valuable insights and understanding of the importance of strategy execution in achieving successful digital transformation outcomes. By focusing on the petrochemicals industry in the Southern African context, the study seeks to generate region-specific knowledge and practical recommendations that can aid organizations in effectively implementing and navigating the complexities of digital transformation initiatives.

1.4 Problem Statement

Digital transformation has become the leading focus of organisations around the globe (Jonasson & Siwert (2019). The accelerated advancement in technologies and systems has provided a unique disruption to ways of working that provides opportunities to greatly optimise, innovate and become more efficient in how a business operates (Sandkuhl, Shilov & Smirnov, 2020). A digital transformation strategy is implemented to coordinate, implement and prioritise an organisation’s effort to create long-term objectives that direct its journey to become digitally transformed (Matt, Hess & Benlian, 2015). Adopting digital technologies impacts various areas in

an organisation by influencing products, processes, sales channels and supply chains (Matt, Hess & Benlian (2015). However, Chanias, Myers and Hess (2018) state that it remains an open argument on how a digital transformation strategy can be developed. The digital transformation strategy approach can be interpreted and institutionalised differently as top management significantly influences the direction taken as a business unit division within a petrochemical company chooses to implement a strategy.

As open as the definitions are of strategy execution, the details of what it entails are vast as the actions taken and descriptions of the activities taking place often differ from organisation to organisation. Previous research indicated a limited sense of how exactly strategy is executed for digital transformation (Chetty & Sutherland, 2010; Jonasson & Siwert, 2019; de Oliveira, Carneiro & Esteves, 2018). The findings are highly subjective as discrepancies can be found due to research papers mainly coming across differentiating factors in finance, banking and IT telecommunications. This study aims to meaningfully contribute to the research of strategy execution in digital transformation in the petrochemicals industry.

There are expansive studies done on strategy execution around the globe. The scope drastically decreases when focusing on Africa and even more so when narrowing it down to the Southern African context. de Oliveira, Carneiro and Esteves (2018) argue that while much has been published on strategy formulation, less study has been dedicated to strategy execution. When incorporating digital transformation into the fray the research becomes limited. Various authors examined South Africa's corporate organisations focusing on strategic management challenges in relation to digital transformation (Dubru, 2017; Gaffley & Pelser, 2021; Manda & Blackhouse, 2017; Modiba & Kekwaletswe, 2020; Tiekam, 2019). Most of these studies focused on leadership insights, the importance of leadership's role in digital transformation strategies and a formulation approach to strategy formulation. However, there is limited information on digital transformation strategy execution and the importance thereof. Therefore, the existing research on digital transformation lacks a clear understanding on how to develop and execute a digital transformation strategy especially in the petrochemical industry.

1.5 Research Objectives

The following objectives guided this study:

- To establish the digital transformation execution strategy adopted by a petrochemical company.
- To examine the factors influencing digital transformation strategy execution.
- To assess the effectiveness of different strategy execution compared to other value chain players.
- To propose a framework to enhance the execution of a digital transformation strategy.

1.6 Research Questions

Table 1.1 Research Questions

Objective	Research question
To establish the digital transformation execution strategy adopted by a petrochemical company.	1. What are the digital transformation execution strategies adopted by a petrochemical company?(RQ1)
To examine the factors influencing digital transformation strategy execution.	2. What factors influence digital transformation execution strategy for petrochemical companies?(RQ2)
To assess the effectiveness of different strategy execution compared to other value chain players.	3. What is the effectiveness of using different strategies in the execution perspectives of different value chains?(RQ3)
To propose a framework to enhance the execution of a digital transformation strategy.	4. What is the possible framework to enhance the execution of a digital transformation strategy?(RQ4)

1.7 Delimitations of the research study

This study was limited to the petrochemical manufacturing industry, specifically manufacturing chemicals and oil refineries. The research findings and recommendations from the sample group were based on their tenure working in this industry.

1.8 Assumptions of the research study

In conducting this study, the following assumptions were made. The research methodology instrument used would elicit reliable and truthful responses. The respondents fully understood the questions they were asked. The respondents

provided open and honest expressions of their knowledge. The researcher consistently presented interview findings. The respondents based their views and insights on the importance of strategy execution objectively.

1.9 The Significance of the Study

The study provided management with key summaries of the findings of this study. The recommendations from this study were derived from experts from the fields of digital transformation and provided insight into the experiences of implementing a digital strategy. This study was undertaken when digital transformation efforts have increased in the last decade. As the accounts of strategy implementation relating to digital transformation strategies remain limited, this study aims to aid further research into this area. The significance of the research paper is in its contribution to the literature on the execution of digital transformation strategies, particularly in the context of Southern Africa. The paper's findings provided insights into the implementation of digital transformation strategies and how they are tailored to meet the needs of a petrochemical organisation. The findings of this study provide deeper insight into the key processes and decisions followed in executing a digital transformation strategy. The frameworks provided bolster the current procedures that exist on how to execute the digital strategy. For the petrochemical industry concerned, the findings and recommendations provide a tailored framework that is fit for purpose and relevant to petrochemical organisations. This was beneficial in the region, and the research paper could serve as a reference point for future studies on digital transformation strategy execution.

1.10 Research Outline

This study consists of five chapters:

Chapter One: Covers the introduction, study background, objectives and research questions. To begin, the purpose of the study is shared, given an account of digital transformation and strategy execution. Secondly, the landscape of research regarding strategy execution is discussed.

Chapter Two: Covers the literature review based on the objectives generated in chapter one. It discusses the empirical literature available on digital transformation strategies and strategy execution. Furthermore, it highlights the challenges and benefits of strategy execution, how organisations navigated digital transformation and

the accounts of the actions taken to execute a strategy. In addition, the chapter addresses the frameworks used by various organisations.

Chapter Three: Discusses the methodological approach this study used, namely a qualitative method. Furthermore, chapter three uncovers the data collection methods and procedures, ethical considerations, data analysis and interpretation. In addition, transferability, trustworthiness, reliability and objectivity are broken down. This chapter highlights the challenges and limitations experienced by the researcher while conducting fieldwork.

Chapter Four: Presents and discusses the results of the research conducted. This chapter analyses the results in relation to the literature in Chapter Two.

Chapter Five: Presents the findings of the study.

Chapter Six: Provides recommendations and conclusions for management and a framework for future research.

1.11 Chapter Summary

This chapter introduced the research report, the background of the study and the problem statement. The research question and objectives were also laid out, highlighting the study's significance and the chapters' research outline. The next chapter explores the literature review for this study and discusses existing literature that sheds light based on the study's objectives.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter was to review the literature aided by the research objectives above in Chapter One. The objective is to investigate the processes, steps and barriers of strategy execution in the context of digital transformation. While also referencing literature to obtain differing perspectives from different related industries. To achieve this, the chapter provided an overview of key concepts related to strategy execution and evaluated existing literature on the ideas, methodologies and approaches adopted. The chapter discussed key frameworks that can positively impact the transition to digital transformation.

2.2 Digital Transformation

Over the past few decades, the world has seen the exponential growth of technology. This growth has increasingly entrenched itself into daily lives, more importantly, an organisation's life. According to Agrawal, Narain and Ullah (2020), digital transformation is important to increase an organisation’s ability to survive as the world's pace of innovation increases. Furthermore, digital transformation, as defined by Ellis, Knickle, Veronesi and Brown (2017), are “the approach by which enterprise brings changes in their business models and ecosystem by leveraging digital competencies and includes areas like big data analytics, mobility, the internet of things, machine learning and B2B networks.” Therefore, as the world adopts new technologies, organisations must adopt the same thinking to survive.

The rate at which innovation occurs in digital transformation needs to be an organisation's strategic decision to achieve success in its value chain (Agrawal et al., 2020). In addition, the exploitation of technological innovation affects large parts of organisations and impacts far beyond an organisation’s borders, impacting areas such as supply chains, sales channels and business processes (Matt, Hess & Benlian, 2015). The statements mentioned above are further supported by Chanias, Myers and Hess (2018), indicating digital technologies can transform an organisation's business model.

Digital transformation is a continuous journey that can greatly alter the shape of a company and its operations. It is, therefore, important to consider clear responsibilities

for implementing a strategy (Chanias, Myers & Hess, 2018). To enable digital transformation, an organisation needs to be agile in its approach, innovative and open to change, as described by Wanasinghe et al. (2021). In addition, digital transformation is a process of continuos innovation and improvement, which needs a culture of shared learning and experimentation Wanasinghe et al. (2021). Furthermore, Peppard, Galliers and Thorogood (2014) argue that the supply chain strategies, in more cases, often do not have a digital component. Thus, digital transformation strategies impact the entire organisation. The execution of the strategy could result in resistance from different areas of the organisation, according to Matt, Hess and Benlian (2015). In addition, not even the success of aligning key stakeholders can ensure the strategic intent materialises (Robey, Ross & Boudreau, 2002). Therefore, a greater understanding of digital transformation strategies' critical and complex role is a key process for successful implementation (Arvidsson, Holmström & Lyytinen, 2014).

2.2.1 Digital Transformation in South Africa

In a study conducted by Manda and Blackhouse (2017), the authors summarise digital transformation has the potential to cause issues for South Africa, with an already high unemployment rate of close to 30%. Furthermore, while South Africa is focused on solving their triple objective of poverty, inequality, and unemployment – digital transformation efforts are hindered. The underperformance of digital transformation, especially in the Southern Africa Development Community (SADC) regions, is driven by an outdated and inflexible business model not designed for the technological disruptions caused by technology innovations (Mokgohloa, Kanakana-Katumba & Maladzhi 2020). South African organisations deal with legacy systems and find navigating their own digital paths difficult. Though some resource-rich and innovative organisations successfully adapt to disruptions, many areas are becoming digitally transformed (Wright, 2019).

Contrary to these authors, the South African government's initiatives and policies promote a successful digital transition. Through collaborations between the government, business society, and institutions of learning, the goal of a digital society is achieved, according to More and Ickson (2021). Businesses in South Africa must transition to digital to remain competitive, as it facilitates growth in key sectors by achieving its digital transformation goals. Achieving this growth could create

employment and economic empowerment, which is essential for the South African economy, according to Gaffley and Pelser (2021). In addition, the South African government is responding to opportunities brought by digital transformation by making inclusive policy and legislative decisions for digital transformation to enable inclusive growth. This is outlined in the National Development Plan 2012 (NDP) (Manda & Blackhouse, 2017).

2.3 Factors that contribute to the success and failure of digital transformation

2.3.1 Success Drivers of digital transformation

For an organisation to succeed in the global market, it is important to take advantage of new technologies and management practices, as cited by Agrawal et al. (2020). Kohnke (2017) identifies three primary requirements for a successful digital transformation: new skills and competencies, different forms of leadership and organisational capabilities. Research conducted by Westerman, Bonnet and Mcafee (2014) concurs that firms who covey a higher digital preparation have superior corporate performance. Furthermore, the signs of a digitally mature organisation have the following characteristics: 1. Digital capabilities and 2. Transformation management capabilities (Agrawal et al., 2020).

In a study conducted by Cichosz, Wallenburg and Knemeyer (2020), the authors studied the success factors associated with leading practices for digital transformation. Their studies are found in Table 2.1:

Table 2.1 - Digital transformation success factors

No	Success Factor	Adopted leading practice
1.	Leadership	Have leaders that execute digital transformation visions and goals.
2.	Supportive organisational culture	Have leaders that support managers by visibly conveying support and physical representation.
3.	Process standardisation	Apply lean management principles and techniques
4.	Employee training and skills development	Developing their digital capabilities by empowering employees and encouraging a collaborative environment.
5.	Agile transformation management	Allow for fast adaption to changing working environments.

Source: Cichosz, Wallenburg & Knemeyer, (2020)

Scholars have produced studies which have studied the important work of success factors and address the issue of how to improve digital transformation and what factors to consider when choosing a strategy (Sandkuhl, Shilov & Smirnov, 2020).

2.3.2 Barriers to digital transformation

Fitzgerald (2014) conducted a study and found several barriers to implementing digital transformation, such as a lack of leadership, digital skills and training. Further remarking that several businesses globally recognise the value of digital transformation, yet five percent of businesses are satisfied with their approaches. Another factor researchers summarise was that no sense of urgency, lack of strategic orientation and inappropriate organisational structures hinder digital transformation (Cichosz, Wallenburg & Knemeyer, 2020). From the points mentioned above, it has been conceptualised that organisations need to realise the importance of solving these inhibitors to strategy execution. Thus, organisations must improve their capabilities to benefit from digital transformation (Agrawal et al., 2020).

2.4 Digital outsourcing

When an organisation transforms itself, it must consider various business activities to reconfigure its business processes, value chains and customer engagement (Westerman, Bonnet & Mcafee, 2014). Before this reconfiguration, however, resource availability plays a key role in the success of implementations (Obeidat, Al-Hadidi &

Masa'deh, 2017). Furthermore, resource availability regarding personnel, finance and time are key factors in determining the success of implementing strategies. Focusing on personnel and time, Balakrishnan and Das (2020) highlight one of the largest impediments to successful strategy implementation is a shortage of organisational resources in the form of the availability of management and personnel. In addition, time is an important resource element; enough time must be devoted to implementation. To remedy the resource availability is digital outsourcing, as described by Hirschheim, Heinzl and Dibbern (2020). Digital outsourcing provides the added capability for achieving innovation. This approach makes use of external providers in a cooperative and competitive setting to achieve a desired digital project (Hirschheim, Heinzl & Dibbern, 2020).

2.5 The relevance of strategy execution

To many organisations, finding the right strategy in this uncertain and rapidly changing environment is paramount for survival. Yet, a more vital and critical issue is that of strategy execution, according to Ranjbar, Shirazi and Blooki (2014). The literature published on strategy management focuses on strategy formulation phases without emphasising the importance of strategy execution, argues Iheanachor (2021). Furthermore, when examining strategic management literature, guidance on strategy implementation has been scarce, unlike the guidance provided for strategy formulation (Katoma & Ungerer, 2011). Thus, as many organisations fail to execute their strategies, it questions the wisdom behind the perfectly formulated strategy. Therefore, the higher failure rate of organisations' strategies is mostly due to poor execution and a lack of experimentation (Srivastava & Sushil, 2013; Chetty & Sutherland, 2010). Oliviera and de Souza (2021) argue that experimentation increases efficiency in delivering strategy execution objectives. Furthermore, experimentation leads to a more personalised and adaptive personal learning experience (Oliviera & de Souza, 2021).

Srivastava and Sushil (2013) mention that the implementation of a strategy is a variable that can vary in its execution; this generally follows different variables and circumstances that affect different organisations. Organisations that vary in size and for-profit and non-profit business models have a similar approach to strategy principles, tools and concepts. However, strategy execution varies regarding size and business models (Ranjbar, Shirazi & Blooki, 2014).

2.5.1 Frameworks essential for successful strategy execution

There are frameworks developed to execute strategy, and a few have been accepted by researchers and practitioners (Chetty & Sutherland, 2010). However, according to Bumann and Peter (2019), many business leaders across the industry struggle to implement digital strategies because they find the process difficult to set up. Hess, Matt, Benlian and Wiesböck (2016) argues that managers are aware of the need to place actionable steps to implement a strategy, but these managers have little guidance and direction to determine the correct course of action. There are a few generally accepted frameworks that have been used for strategy execution that is put into action by organisations (Minarro-Viseras, Baines & Sweeney, 2005).

Over the past decade, there have been several execution frameworks that have become generally accepted as courses of action to execute strategy (Leibbrandt & Botha, 2014). A key framework developed by McKinsey (1982) demonstrates the interconnectedness of the seven elements of an organisation's ability to change and perform. This theory assists managers in navigating how strategy implementation can be improved (Leibbrandt & Botha, 2014). The Mckinsey 7-S framework combines the essential elements by providing an approachable set of actionable links. These include Strategy; structure; shared values; staffing; systems; skills, and style (McKinsey, 1982). This framework draws attention to the organisation's interconnections and how they affect change (Leibbrandt & Botha, 2014).

Another framework developed by Pryor, Anderson, Toombs and Humphreys (2007), which closely ties to the Mckinsey 7-S framework, is the “P” framework for strategy execution. This framework shows the connection between strategy and structure and the influence on employee behaviour while also managing results, according to Leibbrandt and Botha (2014). The framework indicates that strategy provides the structure for strategy execution; the structure provides the behaviour of the employees, and behaviour ensures the success of the results, as indicated by Pryor et al. (2007). The authors state that the connection between strategy and purpose provides the structure, which is the principles relaying internal structures and processes, which are the external structures. The fourth P is the people, which consists of the employees who work in line with the principles and processes. This lays the foundation for the fifth P – performance, the performance indicators used as a criterion for the strategy's success (Pryor et al., 2007).

A framework to consider is the agile methodology for strategy execution. Originally developed from the IT perspective, the agile methodology was later adopted by non-profits, manufacturing and government (Peppard, Galliers & Thorogood, 2014). The authors considered four perspectives for the execution process: flexibility – focusing on the perspective of the stakeholders and team members to ensure adaption to changing requirements and environments; adhering to the principles of collaboration to ensure value creation; internal business processes that support the projects leading to greater satisfaction and success; and learning and development consider using the correct resources and infrastructure to facilitate the first three perspectives and create an environment supporting innovation, according to Wei et al. (2019). The agile methodology is not a fully comprehensive framework compared to the seven-P framework; however, it provides a guide for the strategy execution network (Leibbrandt & Botha, 2014).

The waterfall model is a methodology which approaches implementation in a linear and sequential sequence (Adetokunbo & Basirat, 2013). Petersen, Wohlin and Baca (2009) affirm that the waterfall approach splits projects into activities in a linear order: analysis, design, implementation, testing and maintenance. The approach is structured and process-orientated; the project proceeds from one phase to the next. Once a phase is completed and the next stage begins, there is no opportunity to return to the previous phase (Adetokunbo & Basirat, 2013). The waterfall approach has been well entrenched in the organisation and governance processes. Most digital transformation projects in the past 20 years were implemented following the waterfall approach.

2.6 Digital transformation execution strategy

Strategy execution involves the creation of a portfolio of activities that deliver on a strategy. It involves allocating and managing all relevant resources to deliver on activities, according to de Oliveira, Carneiro and Esteves (2018). Academics and consultants have extensively researched the advent of strategy execution in the past decades. Consequently, there are several suggested approaches and methodologies to ensure a successful strategy implementation (Franken, Edwards & Lambert, 2016).

A business culture open to transformation is a key aspect that comes before the convenience of digital technologies (Guinan, Parise & Langowitz, 2019). Türk and

Salamzadeh (2022) indicate a complex issue: finding or applying the right solution for digital transformation is difficult. Furthermore, despite the potential of digital transformation, not all organisations achieve the desired solutions. As a result, organisations need to apply the necessary stages in developing solutions for digital transformation – by making evaluations, drawing a roadmap, instituting operational transformation, designing digital transformation and ensuring the integration of digital technologies. Once an organisation has established these steps, it can arrive at a better solution (Kane et al., 2019).

In a study by Franken et al. (2016), they highlight ten elements of strategy execution in Table 3.1.

Table 3.1 – Ten Elements of strategy execution

Element	Description
1. Ensuring an organisational culture of continuous change	• Understanding the existing culture of the organisation and state of readiness for change.
	• Highlighting and communicating the organisation's vision of change
	• Communicating any possible implications of the change
2. Understanding the drivers and content of the strategy at the early stage of the lifecycle	• Understand the strategic goals, its drivers and the urgency to instate the strategy
	• Understanding the benefits and the resources needed
3. Aligning implementation activities in relation to the strategic goals	• Understanding the funds, staff, availability and culture required for implementation
	• Prioritising strategy initiatives in relation to strategic goals
1. Support from top management to support the strategy implementation	• Motivating strategic leadership to support and communicate strategic changes

2. Developing and approving each strategic initiative and obtaining approval or rejection	• Understanding the specific requirements of resources, benefits, costs, and process changes for each strategy initiative
	• Defining the strategic initiatives that deliver the business changes required
	• Obtain approval for allocating responsibilities and resources
3. Ensure accountability and governance structures for each strategic initiative	• Clarify accountabilities and institute governing bodies for each strategic initiative
4. Execute strategic initiatives and realise benefits	• Deliver each initiative and understand the benefits realisation
5. Manage strategic initiatives	• Ensure conflict resolution and interdependencies
6. Coordinate the elements of capability	• Ensure the effectiveness of information sharing between each strategic initiative
7. Review and improve capability	• Ongoing assessments and review of learning opportunities for improvements

Source: Franken et al. (2016)

2.6.1 Organisational Structure and Change Management

The organisational structure allows management to organise and coordinate strategy implementation activities. It facilitates decision-making and enables organisations to respond to technological changes (Balakrishnan & Das, 2020). Organisations should facilitate innovation by coordinating strategy, structures, people and processes. A strategy and structure alignment are necessary to successfully implement a new business strategy (Li, Guohui & Eppler, 2008). Furthermore, an organisation may see poor performance results, resulting in a competitive disadvantage.

The size of the organisation's structure dictates the decision-making approach (Haque, Paul, Sarker & Essam, 2019). Furthermore, an overall decision-maker decides for different divisions in a centralised organisation at various stages. In addition, in a decentralised organisation, each division makes its own decisions based on its objectives and goals (Haque et al., 2019). Decentralised decision-making is a very common approach within an organisation structure. Each decision-making

outcome is considered separately and often in isolation (Larbi, Bekrar, Trentesaux & Beldjilali, 2012). However, Haque et al. (2019) noted that even though centralised decision-making is more effective and easier for planning purposes, it is rare to come across organisations with a centralised decision-making structure. This is because achieving integration amongst role players is much more difficult.

Digital transformation requires structural changes to enable new operations. In addition, structural changes refer to levels of variation in an organisation's structure relating to introducing new activities within an organisation's corporate structure (Matt, Hess & Benlian, 2015). These activities are customer-focused to offer the right value proposition and enhance customer engagement. As well as the focus towards identifying new ways of value creation and optimising procedures (Balakrishnan & Das, 2020). Organisations implementing digital transformation align their implementation processes with their business activities. Organisations then integrate their new digital activities with existing operations or run their digital operations via a separate functional department (Hess et al., 2016). Considering either direction, integrating digital activities into existing structures requires less structural change, whilst moving digital operations into a separate structure provides more flexibility (Balakrishnan & Das, 2020).

Wanasinghe et al. (2021) state that while digital transformation impacts the ability to automate physical and cognitive components in the workplace, organisations often fail to consider other impacts, such as corporate culture and labour relations environment. Furthermore, as a result, a lack of buy-in and resistance to change is caused, which in part slows down the adoption rate of new technologies. Challenges in employee onboarding stem from complexities in employee training as leaders and training managers need to scope the correct training method to employees, whether it is on-the-job training, outsourcing to external training services and finding the correct trainer with the right field experience to onboard employees in the petrochemical industry (Spelman et al., 2017).

2.7 Theoretical framework

Upon examining the frameworks obtained in the review of strategy execution, commonalties and themes emerged across the models and frameworks. The competencies were classified into seven categories and used to create the “Digital

transformation execution framework", as illustrated in Figure 2.1. Identifying the essential categories and underlying area competencies that facilitate effective digital transformation in the petrochemical industry is important.

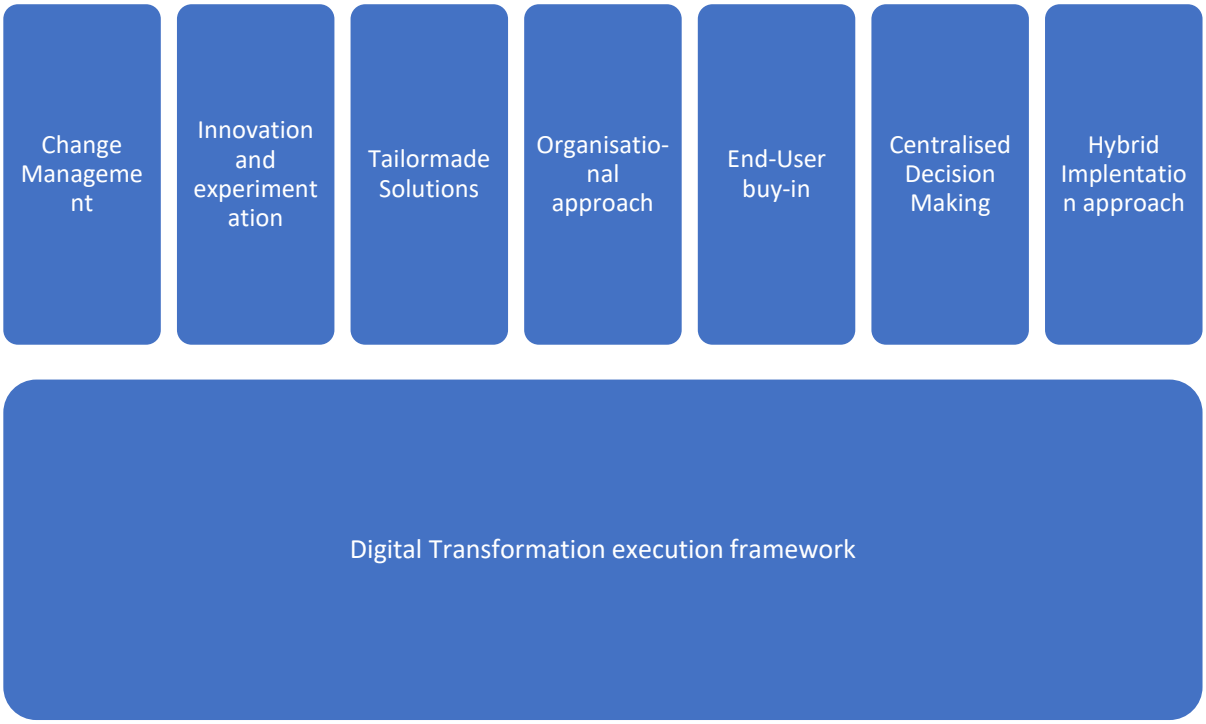

Figure 2.1 - Digital transformation execution framework

The development of this framework was based on a comprehensive review of existing models and frameworks related to strategy execution. During this review process, commonalities and themes were identified among these models and frameworks. These commonalities were then classified into seven categories, which served as the basis for the "Digital transformation execution framework."

The framework, as depicted in Figure 2.1, provides a visual representation of the essential categories and underlying competencies that are crucial for effectively executing digital transformation in the petrochemical industry. It serves as a guide for identifying and understanding the key areas that play a significant role in leading digital transformation initiatives within the petrochemical industry.

To evaluate the candidates during the interview process, the theoretical framework was utilized. The framework provided a structured approach to assess the competencies and areas of focus that are essential for leading digital transformation in the petrochemical industry. By aligning the interview evaluation with the framework,

the research aimed to gather insights and data regarding the application and effectiveness of the framework in a real-world context.

2.8 Chapter Summary

This chapter summarises the literature on digital transformation in a South African context and the factors contributing to its successes and failures. While digital transformation is a continuous journey, it is crucial for an organisation's survivability. This chapter shows that outdated and legacy systems in South Africa pose a challenge to digital transformation. However, government initiatives are promoting a transition. Organisations must adopt new technologies, leadership styles and organisational abilities to succeed locally. This chapter also included digital outsourcing, which emphasised resource availability as a potential solution for organisations facing a shortage of personnel and time. The chapter highlighted the importance of strategy execution and how it is overlooked in favour of strategy formulation. Many organisations struggle to execute their strategies effectively. The chapter covers and describes several key frameworks for strategy execution, including Mckinsey 7-S framework, The P framework and the balanced scorecard framework.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology and the steps to gather and analyse data. Due to the limited research on strategy execution in the digital transformation strategy filed, a qualitative approach was adopted in this chapter. Qualitative research methods were deemed appropriate as they explain the social phenomena and provide understanding. The research population comprised senior management levels and digital consultants responsible for interpreting digital transformation strategies. A purposive sampling method was used to collect data via semi-structured interviews to meet the research objectives. Thematic analysis was chosen as the method of analysis. The chapter also highlighted the steps to ensure the research's credibility, dependability and trustworthiness.

3.2 Research philosophy

The viewpoints of Digital leads, digital consultants, design and optimisation specialists and senior management relating to their experiences with strategy execution have been retrieved. Their subjective opinions, feelings and experiences when interpreting digital transformation strategy into actionable tasks have been sourced. Therefore, a qualitative approach was undertaken for this study. A qualitative approach is appropriate where limited research information exists for a particular topic and population (Leedy & Ormrod, 2010). Ritchie and Lewis (2014) indicate qualitative research methods are used to explain social phenomena while also providing an understanding of social influences and, therefore was deemed appropriate for studying the complex area of strategy execution.

The assessment of the different digital strategy execution perspectives and the inhibitors and drivers thereof, as identified in Chapter Two, was done. With differing views on how to best approach strategy implementation, the perspectives and subjective views on how to implement strategy were captured. As organisations compete to remain competitive and survive in the digital world, the strategy implementation role players need to have the necessary resources and structures to transition their organisations. The qualitative interview method assisted in unpacking the various perspectives on the management of strategy implementation where little research has been conducted (Ritchie & Lewis, 2014). Guided by Leedy and Ormrod

(2010), this approach allowed different perspectives to create a stronger research foundation and allowed the researcher to interview various role players with diverse experiences.

3.3 Research approach

To ensure survivability and remain competitive, the key strategy execution role players need to ensure the success of the implementation of the strategy (Wanasinghe et al., 2021). Considering this, a descriptive approach was adopted to understand the area of strategy execution that needs further research.

3.4 Data collection methods

The most practical data collection method considering the limited research in strategy execution, is face-to-face/zoom interviews. This method provided an opportunity for the interviewees to express their viewpoints. In addition, interviews provided a two-way interaction which offers the researcher to probe if a response is brief or unclear. The interview candidates were contacted via email and telephone to check their willingness to participate in the study and availability to conduct interviews. The interview method provides an opportunity for following-up on unstructured information (Ritchie & Lewis, 2014).

3.5 Population and sample

3.5.1 Population

A population is a set of group members (Saunders & Lewis, 2018). The population set for this study was comprised of senior management levels and digital consultants. These were candidates responsible for interpreting the digital transformation strategies. Furthermore, these candidates were considered part of the population group as key decision-makers in the actionable steps to implement a strategy. As limited research is available from a South African perspective, the population of 12 individuals originated from the towns of Secunda, Vereeniging and Johannesburg.

3.5.2 Sample and sampling method

A purposive sampling method was used. When a specific population is unavailable for selection, non-probability sampling is used (Saunders & Lewis, 2018). The purposive sampling technique allows the researcher to collect data specific to their purpose and research purposes (Robinson, 2014). In addition, purposive sampling is a common

technique to address the research proposition by allowing the active selection of the most productive sample, according to Acharya, Prakash, Saxena and Nigam (2013). With the range of non-probability sampling techniques, this study adopted a two-layered approach, adopting purposive sampling and snowball sampling techniques. The purposive technique was used to apply judgement in selecting the interview candidates who are viewed as being experienced and knowledgeable due to their positions in their organisation. The associated sample size consisted of 12 candidates.

The 12 candidates, 8 males and 4 females respectively, comprised senior managers, digital consultants and middle managers for the perceptions and experience of those who have executed a digital transformation strategy. The sample size was limited to these levels of management for convenience and accessibility – as the organisation had approximately 300 personnel at this level. Another consideration was consistency – as a common set of digital transformation goals was defined throughout the organisation.

3.6 The research instrument

The research instrument adopted for this study was a semi-structured interview schedule. Questions and an interview guide were used for in-depth Zoom/ face-to-face interviews. The interview candidates were asked the same questions, ensuring the content's trustworthiness, credibility and dependability for this study (Saunders & Lewis, 2018). This study aimed to assess the competencies of the key role players who are critical in driving strategy execution within the organisation. Hence, several interview questions were derived from the research objectives in chapter 1, the literature in chapter 2 and the research techniques proposed in chapter 3. The interview guide is available as appendices 1. The development informs the qualitative research methodology of the research propositions, and the process through which the interview questions are derived is critical to the research (Acharya, Prakash, Saxena & Nigam, 2013).

The interview guide (Appendices 1) consisted of the following measures to meet the research objectives:

- Open-ended questions – to allow for open concepts and ideas

- Ratio-scale questions – to collect years of experience, educational and experience questions

3.7 Data analysis

Researchers who have chosen the path of qualitative research face challenges with the data analysis process (Nowell, Norris, White & Moules, 2017). Therefore, thematic analysis is considered for this study. Thematic analysis is the process of identifying patterns in the data collected and interpreting the meaning of the data in relation to the research objectives (Braun & Clarke, 2006). Thematic analysis can be used across various research objectives and is often used in qualitative research methodologies and uses a 6-phase approach formulated by Braun and Clarke (2006). The qualitative tool *Atlas.ti* (Version 22) was the software used to analyse the data captured. The codes and themes derived were result outputs from *Atlas.ti*.

3.8 Limitations of the study

The possible limitations of this study were that the results might not be generalised to digital transformation initiatives found in large manufacturing organisations in South Africa as the findings are derived from one organisation. However, the insights from this study could be used in future studies. The researcher was prone to be subjected to biases due to his relationship with the organisation. However, this was safeguarded through following the ethical principles of research. Due to time and convenience, reaching out to large-scale organisations proved difficult, especially considering the limitations around the digital maturity of other large-scale manufacturing organisations.

3.9 Trustworthiness of the Study

For this qualitative study, trustworthiness was extremely important to this research. Bless, Higson-Smith and Sithole (2018) indicate three key attributes that speak to the type of qualitative study findings the research should produce, and the same was ensured in this study:

- *Credibility*

  Refers to how accurately the data reflects the interviewee's opinions (Bless, Higson-Smith & Sithole, 2018). The researcher ensured the accurate capturing of data from interview candidates.

- *Conformability*

Refers to the extent future researchers could conduct similar studies and produce similar results. Similar questions were asked during interviews with different participants to ensure this in the study.

- *Dependability*

  It was ensured that each step of the research process was described to the interview candidates. The researcher followed an interview guide with specific instructions on how to conduct interviews.

3.10 Ethical considerations

Research ethics assist in preventing research abuses and assists researchers in understanding their responsibilities as ethical researchers. In addition, research ethics ensures the human and sensitive treatment of research participants, who may be placed at risk by research procedures (Bless et al., 2018). The interviews were

conducted on the organisation's premises if face-to-face interviews are conducted. Zoom interviews were conducted in space and time deemed the most comfortable for the interviewee. The approval to conduct this research was requested and obtained from the organisation if approval is made regarding company name usage and employee identity confidentially – Pseudo names were provided to the company and interview candidates. The researcher applied for ethics clearance from the university to be granted permission to conduct this research (appendix 5).

Research ethics principles were followed by providing candidates with an informed consent form. This document provided the interview candidates with a breakdown of the research, including their voluntary participation and the opportunity to withdraw from the study at any point. The document outlined the request for permission for the interviews to be recorded and stated that the interviews were recorded for transcription. All user and personal data were considered in accordance with the Protection of Personal Information Act (POPIA).

3.11 Chapter Summary

This chapter discussed the research approach that was adopted for this study. A qualitative study was chosen with interviews to collect data. The candidates for this research are going to be purposively sampled. For the data analysis, the thematic

analysis was considered for this study and used to code the data into themes. These themes emerged from the findings and the literature. The chapter also addresses the limitations and ethical considerations of the study.

Chapter 4: Analysis of results

4.1 Introduction

This chapter analyses the results from the interviews and research questions formulated in chapter two. The results are based on data analysis from the semi-structured, face-to-face interviews. The interview questions were designed to align them with the research questions derived in Chapter Two. This was done to ensure consistency between the research objectives and questions. A consistency matrix provided in appendix 3 ensured consistency between the literature reviewed, the data collected and the analyses methods.

4.2 Description of the Sample

Twelve interviews were carried out for this research, comprising eight male and four female participants. The list of respondents is provided in Table 4.1. Purposive and snowball sampling techniques were used to select 12 interview candidates. Table 3 indicates their gender, division in the organisation, department and designation. The anonymity of their names was maintained as agreed with the respondents. The researcher approached individuals experienced in the execution of digital transformation implementations. The candidates selected consisted of eight males and four females. All of the twelve interviews were conducted via Zoom face-to-face sessions due to the geographic location and preference of the interviewees.

Table 4.1 - List of interview respondents

Interviewee	Gender	Division	Department	Position
P1	Male	Chemicals	Supply Chain Support Services	Senior Business Analyst
P2	Male	Chemicals	Supply Chain Support Services	Senior Manager: Supply Chain Support Services
P3	Male	Chemicals	Supply Chain Support Services	Specialist Design and optimisation
P4	Female	Performance Solutions	Digital Catalyst Studio	Digital Product Owner
P5	Male	Performance Solutions	Digital Catalyst Studio	Lead: Digital Chemicals
P6	Male	Energy	Supply Chain Operations Services	Senior Manager: Supply Chain Support Services
P7	Female	IM – Information Management	IM – Chemicals	Product Owner

P8	Male	Energy	Supply Chain Support Services	Specialist Design and optimisation
P9	Male	IM – Information Management	IM – Energy	Solutions Architect
P10	Female	IM – Information Management	Group IM – Business Enablement	Process Lead – Business Enablement Management
P11	Male	Energy	IM – Business Portfolio Management	Senior Manager Energy business portfolio management
P12	Female	Chemicals	Supply Chain Support Services	Technology Enablement Manager

4.3 Presentation of Results

The results are presented in conjunction with the research objectives and questions in Chapter 1. In addition to the interview guide questions presented in Appendix 1.

4.4 Results for Research Question 1

RQ 1: What are the digital transformation execution strategies adopted by a petrochemical company?

To frame the discussion, the two interview questions obtained a view of the interviewees' understanding of digital transformation whilst also providing context to achieving digital transformation goals in a petrochemicals organisation.

The advent of digital transformation garners various definitions and ideologies, which vary from individual to organisation. The interview candidates expressed their views and gave unique insights into their understanding. The insights shown in Table 4.2 were consistent among interview candidates, with some providing their experience and understanding of digital transformation.

Table 4.2: Codes derived from research question 1

Theme
Business culture Transformation
Innovation
Change management
Organisational Approach

The candidates describe digital transformation as a journey the organisation goes through in a constantly changing environment. In the petrochemical industry, there is a clear emphasis on prepping to transform, as indicated by the Digital Lead;

> *"There's a strategy in terms of how do you transform our business culturally, you know, and that speaks to ways of working."* (A5,4:1).

A certain level of business transformation occurs when organisations adopt a digital transformation strategy. A senior manager indicated:

> *"If you look at where we are now, I think the world over is that everyone is digitizing. If you move fast, you'll have a clearer way of where you're going. You need to be in the detail space because it's more efficient."* (A6,5:1).

Digital transformation is understood to be a constantly moving target that requires action by organisations to implement and develop new ways of working. This statement justifies this:

> *"We kind of try to fix this aeroplane in flight because you can't stop anything to start something afresh. So our strategy is to build on what we have and make sure it's digitized without really stopping"* (A6,5:17).

Achieving digital transformation goals is a relentless pursuit of implementing new digital ways of working in an organisation culturally accepting this change.

In terms of strategies adopted, great emphasis is placed on benchmarking. The organisation constantly assesses its position by viewing what competitors are doing. Thus one interviewee had this to say:

> *"What am I trying to solve for, and you develop a strategy, so it's more problem-driven, it is not so much because the other alternative could be to say, OK: let's look at benchmark, right? Look at what the players like us are doing and go on a total wholesale change"* (A6,5:5).

A solutions architect further supports this by stating:

> "*What we normally do, obviously, we go out to the market. We understand what our competition is doing and do some research. We also speak to our customers. That's when now we go back and align to you to say that's what my customers want, but that's the approach. That we've been doing. First, look at your competition and then your customers' requirements."* (A9,9:3).

The interview candidates shared various approaches. From the analysis, there is a strong emphasis on experimentation and the ability of the organisation to allow for innovation and a digital lead shared:

> *"Digital transformation stuff is centred around very complex problems that can be solved in a normal way, so you need a very specific set of processes that can help you to turn quickly. First, ensure that you experiment, you innovate. If things fail, you can come back quickly."* (A5,4:8).

This petrochemical organisation encourages individuals to experiment with new concepts to achieve a digital transformation goal. This participant indicated this:

> *"These problems iterate, engage, get it wrong, get it right, try again, rinse cleans, try again, rinse cleans, try again and until it's resolved, and that's the way of going about this strategy."* (A5,4:9).

An aspect mentioned by the interview candidates is change management. Change management proves important in environments where there is difficulty in transitioning. Resistance to change was a theme deriving from the interviews. Change management is an immediate remedy to this challenge. An interview candidate shares their perspective on how change is difficult for some employees:

> *"There are many examples of tools or solutions or whatever have been implemented. Which don't really solve a business problem, or it's too difficult, or it breaks, and then people revert back to old ways of working."* (A4,3:10).

Another candidate shares the same sentiment about change management and old working methods, indicating:

> *"It's the same old factors. I think one is, obviously, having spoken about various communities that are affected by what you want to put in place. Is that resistance to change? You know people, we are certain ways, we're comfortable with the with our little piece of work because as you know, I might find it efficient in my little space in terms of time and cost - but when you when you combined with the rest of the guys, we find that you are actually very, very inefficient. But because you're just looking at your space, you don't see the need to change or the difficulty. Maybe the challenge for people like us is to communicate well and correctly message the future state, right?"* (A6:5:10)

The interview candidates shared that the organisation's approach to implementing is important. Several considerations need to be considered. For instance, one participant stated:

> *"So as the need arises from a business perspective, you know, even as a support service, people get involved. There's a table for an outlet, say implementers. You know what we need to do to make it. So as you know, social processes. Suppose I have a business case. Uh, you get signed off, you do a scope of work, and if you need external resources, they need to go follow that process as well."* (A1,7:6).

Another candidate shares how their value chain approaches business needs:

> *"From an IM perspective, obviously. It's very much around enablement. OK, the key is our ability to respond fairly rapidly to changes that might come from a business perspective, especially regarding our ability to integrate." (A7,6:2).*

The key factors surrounding the organisation's approach are to respond to the business needs and identify the best ways to provide a solution to the problem the business needs solving are

4.5 Results for Research Question 2

RQ2: What are the factors influencing digital transformation execution strategy for petrochemical company?

This research question aims to comprehend the essential factors that impact the achievement of a digital transformation objective. The interview questions covering the objective of research question 2 indicate the typical facilitative factors needed to execute. As well as what are the key successes and failures an organisation needs to focus on to ensure a successful digital transformation strategy.

In embarking on a digital transformation goal, an organisation needs to include several factors before beginning a project. These factors ensure the success of a digital transformation goal and often form the building blueprint for more digital transformation initiatives. An overwhelming facilitative factor is an end-user buy-in; many interviewees strongly shared their views; a respondent stated:

> *"If the users are not on board. You can forget it. You might have the best and the right digital systems, automation, or systems in general. It won't work if the people that need to use that system or digital strategy are not on board. It's useless. It would help if you got them on board. It's difficult."* (A2,1:10).

Buy-in by end-users is critical as the users ultimately prove that implementing a strategic goal will succeed. This interview candidate indicated:

> "*The main thing for me is just being able to build that community, right, build it, and ensure everyone has the same version of the truth. You know, from where we are currently to where we want to get to, and everyone buys in it."* (A6,5:9).

A large focus needs to be on the users who use the new systems, technology and digital processes implemented. Ensuring a tailor-made solution is a key factor in determining a successful implementation. An interview candidate stated,

> *"I think starting point is understanding the objective. I think it sounds very simplistic, but it's it can be a bit tricky. It's just to understand our definition, the problem we are trying to solve and your definition of victory. It could be a one-*

liner, but that one-liner could cause quite a lot of infighting or displeasure within your stakeholders, so I think that's why I'm saying that it must be very clear what our objectives are." (A3,2:6).

Implementation teams need to ensure they involve end users by scripting a clear definition of goals. Another common thread in the facilitative factors is the business's ability to find solutions that work for them. An interview candidate indicated,

"People must be empowered to make decisions if people are not empowered to make decisions. That's also not good. You need to allow teams to self-regulate, so people must be able to direct themselves if the company is in such a way that people cannot direct themselves. You won't make progress simply because this must be a high-paced environment." (A11,4:22).

End-user involvement in the solution development phase can contribute to the ease of following the right steps to implementing a digital transformation strategy. A senior manager shared:

"Super users or subject matter experts that we can basically partner with and that will also ensure the success of what we're implementing and then yeah, you know, setting realistic expectations, we typically we have an idea of sequence when it comes to the road map," (A12,3:6).

4.6 Results for Research Question 3

RQ3: What is the effectiveness of using different strategies in the execution perspectives of different value chains?

Determining a strategy to execute digital transformation can take different approaches. This is more prevalent in a large organisation. In the case of this petrochemical organisation, different business users opt for different execution methodologies. As shared by the interview candidates, decentralised decision-making causes business units to go in different directions, with each role player indicating preferences for

different approaches based on prior experience and the complexity of projects. To indicate this, a candidate shared:

> *"There's a reason why that works in chemicals. The reason why that works is there's a very strong sense of all the people are proud. It's this culture that I'm proud of what I'm doing, so if you remove that from them, you may not necessarily get support. In chemicals, it's different. The ownership does not sit with the chemical function. The ownership lies with the digital team. So, we are applying a pull execution in whatever business pool we do. Energy is the opposite. You need to push it because if you don't, there's no pull."* (A12,4:30)

The differing philosophy from leadership causes varying execution methodologies. The digital lead shares their account and indicates a centralised decision maker on an agreed strategy should be considered:

> *"We have to have a steering committee that manages the entire programme because it affects many people in that space. You require that overarching leadership function. Suppose I may put it that way. You know who's responsible. Do you have a single point of accountability from an execution standpoint? Who is that person? "* (A5,4:27).

Ultimately, due to the nature of the large petrochemical organisation, the business has both local and international operations, making it difficult for a centralised decision-making body, as mentioned here:

> *"if you look at chemicals, it's a global function, and energy is a broken function. So, it would help to be locally responsive when you digitalise energy. It would help if you were quite concerned with what is happening locally. If you enter the chemical space, your thinking is slightly different. It would help if you looked at global integration. How do I bring all these small pieces of businesses that exist everywhere together so you have global integration?"* (A5,4:29).

The business units follow their status quo and what is fit for their business, as a senior manager indicates:

> *"That is a result of an organisation that has consciously decided to digitalize, and if it's not like that, then there's not going to be any special language because you'll do your own thing. I do my own, whatever system you want, and that's it."* (A2,1:15).

The organisation's decentralized decision-making gives light to varying approaches to strategy execution, with numerous examples of candidates indicating a blended/hybrid approach or a set methodology. A product owner shared:

> *"Again, there's merit in both sets of project management methodologies, and so you know when you're looking at digital transformation, it's, I mean, it's a big It's typically big. It's a big concept. So, you might find your business stakeholders all comfortable with a blended approach, so you know you take the positives of certain target milestones after the waterfall, but then reach those milestones you implement and execute according to the nature of joint work."* (A4,3:14).

Certain business units and departments weigh out the options for an execution approach, as shared by this interviewee:

> *"So there, the approach again is hybrid, you're not going to introduce this across all sites, but you choose specific sites. To say, you know, push the new way until it's established. You dig the trenches. You set it in. You're comfortable. You pilot and then start to up, you know, to scale it up. It's more hybrid. At least, it's what I've seen across the other department."* (A6,5:13).

While the blended approach proved popular, certain business units preferred a specific strategy. Respondents referred to agile methodology and the waterfall approach as their implementation strategy. Respondents also commented on their experience with what other business units used as an implementation strategy. An interviewee shared,

> *"So I think with within the IM space digital space, in particular, they very much want an agile way of working for all the initiatives, and I find that on our side, we still, pretty much on the on the older way of working and the waterfall, in terms of approach to our projects."* (A3,2:11).

On the other side of the spectrum, the candidate shares how their division prefers the agile methodology and mentions in their experience how other divisions still use the waterfall approach, as mentioned here:

> *"You know, we tend to follow an agile framework, and a lot of other teams do kind of a waterfall methodology. I think there are pros and cons to both, and I think they are, I guess, motivations either way. (A10,*3:12).

An interview candidate provides another execution in methodology in the BDI model:

> *"Our business has kind of been built around the waterfall approach to project implementation. So, our governance steps are aligned with the various tools we use. As an organisation is aligned to waterfall approach, the BDI model, those are things that are both again around kind of a waterfall approach to project execution."* (A4,3:15).

4.7 Results for Research Question 4

RQ4: What is the possible framework to enhance the execution of a digital transformation strategy?

From the various incites and views captured, this research question aimed to collect the common threads in an organisation's approach to executing a digital transformation strategy. Table 4.3 defines what should be considered when executing the gathered responses.

Table4.3: Codes derived from research question 4

Code	Sub-code
Implementation approach	Agile Methodology
Resources	Dedicated budget The right skilled people
Sandbox environment	Training and development Allow for experimentation and innovation Learnings
Purpose	Clear goals and objectives Clear problem statement Integrated solution

4.7.1 Purpose

There was a consensus about the approach to strategy execution amongst the interview candidates. From the execution strategy, clarity is needed to better inform the problem statement, goals and objectives. Below are responses to suggested a framework should incorporate a couple of components as suggested by various participants;

> *"The main thing is absolute clarity on what does digital transformation mean? OK, so at least clarity on the one or two things we need to take when you know when we are looking for when we're doing an implementation."* (A7,6:15)

> *"The problem statement. What is it that you're trying to resolve? Sort out? (A11,*1:20)

> *"I Think starting point is understanding the objective. I think it's it sounds very simplistic, but it's it can be a bit tricky. It's just to understand what is our definition of it. What is the problem that we are trying to solve? (A3,*2:6)

> *"I think a well-integrated solution that needs to be quite clear as well. We've got the times the silo mentality. Whereby it's about what I want in my particular part of the process"* (A12,2:13)

4.7.2 Resources

The allocation of resources plays a critical role in the success of digital transformation initiatives. A product owner shared:

"And when I speak of capacity. Obviously, that also talks to what is the budget? What is the funding? What is thinking of digital transformation." (A7,6:17).

Complementing the financial resources and having the right people and resources is an important consideration in an implementation framework. A candidate indicated:

"And I think having the right people. In having the right people in those positions and goes without saying. I think it needs to be managed from the top down." (A3,2:14).

4.7.3 Sand-box environment

The act of experimentation needs to be adopted according to some interview candidates. One interview candidate explained:

“If you don't reward failure, it means you are not rewarding people or people trying new things, for you need to have a separate dedicated budget for digital and experimentation." (A5,4:32).

Other interview candidates mention the same willingness to experiment by indicating,

"I think some of the real constraints that we're also, you know, needing to stretch thinking, needing to also think, different and innovate. Innovate in the space and the time when we're at and then understand what we have available not to necessarily constrain the thinking." (A7,6:18).

In addition to allowing for experimentation, the right people require training in new areas that the project implementation will bring. The idea shared is to take core individuals and make them subject matter experts, allowing these superusers to train the rest of the business. A digital product owner shared this:

"Start with the core group, right the core group. That will be like the core users of the system. Train them along the way as they first develop with them. Part of the development, do the training, and once that is done, then train the rest of the users to do the upskilling. " (A4,5:15).

The interviewees emphasized the importance of having appropriately qualified individuals in specific positions to lead successful digital transformation projects, as one candidate indicated:

> *“The right people for the job. So, you need to go beyond the traditions of appointing people through experience. You know somebody's had experience in it can be established for themselves because they would want to do the things always."* (A5,4:31).

4.7.4 Implementation approach

An implementation philosophy was a critical point stressed by several interview candidates. A product owner stated,

> *"Agile is a mindset in terms of getting, let's say, getting some degree of comfort with or, let's say, stepping away or just shifting gears and being able to focus on. Let's look at something small. Let's deliver something incremental. Let's really get really to solve real problems quickly. You know, quick and fast. So that's a very different mindset."* (A7,6:12).

Another candidate echoed,

> *"It's to have the right implementation strategy. Firstly, I think it would be agile, particularly for these digital projects. I think I do agree that agile is sort of the right way to go. The better, better way to go."* (A1,2:12).

Incremental-based implementations allow teams to achieve small victories in the digital transformation strategy goals and implementations.

4.8 Chapter Summary

This chapter aimed to examine the feedback obtained from the conducted interviews. The themes from the interview questions were analysed and presented under the relevant research questions. From the feedback received, the interview respondents

gave their experience and insights into digital transformation execution. Their views surrounding the importance of being able to execute and the several ways of accomplishing an implementation are captured and reviewed. Based on the responses, the interview candidates knew the meaning of digital transformation and its disruptive nature. The respondents understood the key factors to execute a digital transformation goal. Key to the success is end-user buy-in to tailor a solution fit for the users and their environment. Interview candidates shared that for their petrochemical organisation, different business units opt for different execution methodologies. As the respondents indicated, decentralised decision-making has caused business units to go in different directions. These differing viewpoints are a result of prior experiences and project complexity. Based on the responses, business units preferred a blended approach over a set methodology. Though a blended approach proved popular, a set methodology also prevailed, with the respondents preferring agile or waterfall approaches. Based on the gathered insights for research question 4, a framework was identified, including the following key elements: clear goals and objectives, a clear problem statement, an integrated solution, an agile methodology for implementation, a dedicated budget with the right people and a sandbox environment for experimentation and innovation. This framework guides organisations to use when executing their digital transformation initiatives. This framework could prove crucial for the success of these digital transformation strategies.

Chapter 5: Discussion of Results

5.1 introduction

In Chapter Five, the research findings on digital transformation strategy execution, which were derived from the literature reviewed in Chapter Two, are discussed. The research questions indicated in Chapter One, combined with the literature reviewed in Chapter Two and the findings and themes discussed in Chapter Five, were formulated with the research methodology and design outlined in Chapter Three. Chapter Five presents the results from the semi-structured interviews conducted with 12 individuals employed in a petrochemical organisation, using the research methodology and design outlined in chapter three. In addition, based on the insights gained from the experienced individuals from a strategy execution aspect, the analysis aimed to confirm the research objectives outlined in Chapter One. The research findings contribute to both theory and practice. The insights gained from experienced individuals provide the critical proficiencies required to execute a digital transformation strategy.

5.2 Discussion of Results for Research Question 1

What are the digital transformation execution strategies adopted by a petrochemical company?

The analysis of research question 1 aimed to identify the digital transformation strategies adopted by a petrochemical organisation. Interview guide questions aimed to identify the candidates' understanding of digital transformation and ascertain their level of experience with digital transformation goals by executing a strategic goal. As well as to highlight the strategies adopted whilst executing a strategic goal.

5.2.1 Description of interview candidates' understanding of digital transformation

The interview candidates' understanding of digital transformation varies based on the analysis of research question 1. The respondents concur that digital transformation is a journey that requires an organisation to adapt to changing external environment. Culturally, the business needs to transform in the same breadth. The respondents

understand that the world is shifting to a digital landscape, and organisations must change and build new digital channels while carrying on daily operations. Chanias, Myers and Hess (2018) and Peppard, Galliers and Thorogood (2014) confirm that it is important for organisations to make the responsibilities and goals clear when implementing a digital transformation strategy. The organisation needs to be focused on its approach and be open to experimenting and learning. Wanasinghe et al. (2021) affirm that digital transformation is a journey towards continuous improvement, and organisations need to transform culturally to ensure the success of an implementation.

5.2.2 Change Management

Based on the interview candidates' responses, changement was highlighted by several candidates, first indicating that resistance to change is a common theme when executing a digital transformation initiative. The candidates shared accounts of employees not liking change, finding it difficult to adopt new changes, and reverting to the old ways of working. Wanasinghe et al. (2021) highlight that organisations often overlook the impacts on the labour force. At the same time, Spelman et al. (2017) concur by indicating that the complexities in employee onboarding often slow the adoption rates of new technology implementations.

5.2.3 Innovation

Innovation appeared to be a recurring theme among the interview candidates. The candidates shared that with the execution of digital transformation strategies, their organisation encourages a culture of experimentation and innovation to reach their goals. The respondents emphasised the need to experiment and innovate to solve complex problems. Experimentation allows for a more personalised and adaptive learning experience, confirms Oliviera and de Souza (2021). Experimentation offers increased efficiency in the success and delivery of digital transformation implementation initiatives (Srivastava & Sushil, 2013; Oliviera & de Souza, 2021).

5.2.4 Organisational approach

The analysis indicated that for an organisation to achieve successful digital transformation, its leaders must commit to aligning its goals with digital initiatives. The participants emphasised the importance of the organisation approach to implement digital projects with a clear roadmap, timelines and objectives. This is to help manage expectations and ensure successful outcomes. The organisational approach allows

top management to organise and coordinate the strategy of implementation activities. It better facilitates decision-making for organisations to respond to technological changes (Balakrishnan & Das, 2020; Li, Guohui & Eppler, 2008).

5.3 Discussion of Results for Research Question 2

What are the factors influencing digital transformation execution strategy for petrochemical company?

The objective of the second research question was to determine the factors that impact the implementation of a digital transformation strategy. The interview guide questions aimed to extract the insights and opinions of the interview candidates' views on the factors that influence digital transformation execution strategies. The digital transformation of the business units can impact the organisation's performance; thus, it requires a well-thought-out strategy. This objective is critical as it provides insights into the factors influencing the success and pitfalls of digital transformation projects in a petrochemical organisation.

5.3.1 End-user Buy-in as a facilitative factor for a digital transformation strategy

Based on the data analysis, one key facilitative factor was end-user buy-in. Several interview candidates emphasised this factor and highlighted the importance of ensuring end-users were part of the process when implementing new digital processes, technologies and systems. Adopting new processes can be challenging for end-users, especially if they use traditional methods. Execution of strategies could result in resistance to new implementation highlights (Matt et al., 2015; Robey et al., 2002). Thus, end-users profound comprehension of the crucial and intricate role of digital transformation strategies is a significant driver of success, as propounded by Arvidsson, Holmström and Lyytinen (2014).

5.3.2 Tailormade Solutions for successful implementations

As per the findings, the next factor is to ensure a tailormade solution. To ensure this facilitative factor, the organisation involves the end-user in developing goals and objectives. This ensures a level of involvement that institutes a culture of development and overall acceptance of a strategic goal (Franken et al., 2016; Cichosz, Wallenburg & Knemeyer, 2020). The respondents indicated that not having a clear objective and

goal impacts the implementation process negatively, resulting in the project losing strategic orientation and causing end-users to have no sense of urgency towards the strategic goal, confirming the earlier findings of Agrawal et al. (2020). The interview candidates indicate that involving end-users in the solution development phase contributes to the ease of following the right steps to implement a digital implementation. Once an organisation makes these steps, the project benefits from the tailored solutions that arise (Kane et al., 2019).

5.4 Discussion of Results for Research Question 3

What is the effectiveness of using different strategies in the execution perspectives of different value chains?

The objective of research question 3 is to determine the different approaches to executing digital transformation strategies in a petrochemical organisation. The interview guide questions aimed to gain insight into the factors affecting the decision-making process and adopting these approaches. The insights provided give a greater understanding of best practices identified amongst different value chain players.

5.4.1 Centralised versus decentralised

The interview candidates shared that the organisation follows a decentralised approach to decision-making, which results in entire divisions of the organisation going in different directions. Each division has differing approaches to strategy implementation based on previous experience and the complexities of the projects. Haque et al. (2019) confirm this by stating the size of organisations often leads to differing decision-making approaches. The interview candidates recommend that a centralised decision-making body is the best approach, as this can provide a single overarching body to manage initiatives and a single point of accountability. However, many interview candidates accept and prefer the decentralised approach as it provides autonomy and freedom to apply their strategy implementation methodologies. Larbi et al. (2012) confirm this by indicating that decentralised decision-making benefits decisions made in isolation, as each change request can be considered separately.

5.4.2 The Hybrid Approach

Based on the feedback from the interview candidates, there was a strong response to the agile methodology as an approach to digital transformation implementation. The candidates indicated the flexibility and collaboration amongst key stakeholders and team members enable the implementation team to navigate changes whilst delivering on a project. Peppard, Galliers and Thorogood (2014) agree with this as they indicate that agile methodology provides flexibility and creates more collaboration between team members to adapt to changing requirements.

Even though the respondents completed the agile methodology, the interview candidates indicated that pockets of the organisation still use the waterfall implementation methodology as this traditional approach provides a more stable and less frantic approach to project implementation. The respondents indicated that individuals still prefer to use this approach based on the complexities of projects and the organisation's experience adopting the waterfall approach. The waterfall approach provides a sequential approach to implementation, providing clear goals for the implementation teams. Adetokunbo and Basirat (2013) confirm the waterfall methodology is sequential in its implementation activities. Furthermore, Petersen et al. (2009) confirmed that the waterfall methodology follows a structured process approach.

5.5 Discussion of Results for Research Question 4

What is the possible framework to enhance the execution of a digital transformation strategy?

The fourth research question aimed to identify a potential framework for improving the implementation of a digital transformation strategy. The four primary codes that emerged from the interviewees' responses were captured as follows: purpose, resources, sandbox environment and the implementation approach. The interview guide questions aimed to extract the key success points based on the various experiences of the interview candidates.

5.5.1 Purpose as a critical component of the Framework for digital transformation execution

Many respondents shared that a clear purpose is critical to the success of project execution. According to the interviewees when the purpose is clearly defined to better inform the problem statement, goals and objectives. This aligned with the “P” model framework, where Pryor et al. (2007) indicate the purpose and one of the key principles. Furthermore, purpose involves elements that highlight the intentions of an organisation. The interview candidates indicated that purpose helps overcome a silo mentality and leads to more focused and effective efforts.

5.5.2 Resource Allocation in the execution of the digital transformation

To ensure the success of a digital transformation initiative, the interviewees emphasized the importance of allocating appropriate financial and human resources. The interview candidates placed a key emphasis on having a dedicated budget as well as having the right people with the right skills. McKinsey’s 7S model affirms the importance of resources in the form of budget, staff, and skills is critical to the success of a strategic goal (McKinsey, 1982).

5.5.3 A sandbox environment and the need for experimentation and innovation

Some of the interview candidates shared that the act of experimentation needs to be adopted. They indicate the organisation should have a sandbox environment to allow innovation to grow. Agrawal et al. (2020) confirm this by stating that the organisation's will to innovate is a strategic decision. The interview candidates explain that failure should be rewarded, and people should be able to stretch and innovate. Wanasinghe et al. (2021) affirm this by indicating innovation needs a culture of shared learning and experimentation to achieve digital transformation.

5.5.4 Agile Methodology as a critical implementation approach

The respondent’s interview feedback identified agile methodology as a common approach when implementing digital transformation initiatives. The interview candidates highlighted the ability of teams to solve problems and focus on achieving

small incremental steps and achieve quick wins. The findings were in sync with Wei et al. (2019), who confirmed that agile methodology allows for flexibility for the organisation to focus on the project requirements. The overall view from the insights of the interview candidates was an organisation should consider an agile approach as the clear incremental-based implementation strategy.

5.6 Chapter Summary

This chapter aimed to verify whether the outcomes of the interviews analysed in chapter four aligned with the literature review presented in chapter two and whether the research questions posited in chapter one were answered. The chapter discusses the findings of each research question and compares them with the relevant literature. Research question one aimed to determine the participants' comprehension of digital transformation and their expertise in executing digital transformation goals. As well as to highlight the strategies adopted whilst executing a strategic goal. Regarding research question 2, The questions aimed to extract insights and opinions on the factors influencing digital transformation execution strategies. Regarding research question 3, the aim was to comprehend the factors that affect the adoption of digital transformation strategies and the decision-making process involved. Lastly, for research question 4, The objective was to help identify a possible framework to enhance the execution of a digital transformation strategy.

Chapter 6: Summary, Conclusions and Recommendations

6.1 Introduction

This chapter serves as the conclusion and summarises the key findings and recommendations derived from the study. The research aimed to understand the critical aspects and decisions that a petrochemical organisation in South Africa must consider when actively implementing digital transformation goals. The findings of this research have significant implications for organisations undertaking digital transformation, and a tailored approach to digital execution is recommended. This chapter concludes with the study's limitations and the areas for future research and presents the recommendations based on the framework developed to assist organisations in successfully executing digital transformation goals.

6.2 Summary of the research report

In a South African context, the digitalisation of industries and, more specifically, the digitalisation in the petrochemicals industry is revolutionising. The key impact is it challenges the future sustainability of petrochemical organisations. This leads organisations to digitally transform their processes and structures to keep up with the technological leaps and the threat of remaining obsolete in an ever-changing environment. With the threat of disintermediation, organisations are forced to drive for efficiency while building an aeroplane in flight. This requires bold decisions and an agile organisation to achieve this step.

The research conducted in this research paper aimed to understand the importance of the execution of a digital transformation goal. The experienced individuals tasked with delivering on these digital transformation goals and objectives are critical to this task. The research conducted captured diverse insights and experiences. The results were to understand what key themes are derived to form a framework that could become essential for achieving digital transformation success.

Regarding research question 3, the aim was to comprehend the factors that affect the adoption of digital transformation strategies and the decision-making process involved. To investigate the critical factors and decisions a petrochemical organisation must take to sustain digital implementations actively. To conclude, a framework was developed using the feedback provided by interview candidates and the analysis thereof.

6.3 Conclusions

This research was conducted a thorough review of the literature on the execution of digital transformation strategy; combined with the information included from face-to-face interviews and the analysis thereof, an execution framework for digital transformation was developed based on empirical evidence. The study concludes that executing digital transformation goals is complex enough to warrant a different framework than traditional strategy execution frameworks. As a result, a much more tailored approach to digital execution is advised for organisations undertaking digital transformation. The findings of this research provided a multidimensional approach required for digital transformation execution. The expertise of the 12 interviewees, who held various senior roles, was regarded as a crucial factor in the successful adoption of digital transformation within their organisation. The development of the digital transformation execution framework integrates key facilitative factors that must be considered simultaneously as an approach. This, in part, increases the successful implementation of digital transformation.

6.4 Contribution of the Study to the Body of Knowledge

This study makes a significant contribution to the body of knowledge on the effects of digital transformation on organisations. The study examines the challenges and opportunities that arise when organisations go through digitalisation and the impact of these changes on organisational performance. By conducting a thorough literature review and analysing a petrochemical organisation, this study sheds light on the crucial factors determining the success of implementing digital transformation strategies. This knowledge is relevant to the current business landscape, where digital transformation initiatives become central to organisational strategy and operations. The insights from this study could be of great value to academics, top and senior management, and project teams seeking to understand and manage the impact of digital transformation on organisations.

6.5 Recommendations

A proposal for a framework was unfolded for the duration of this research paper. The framework began by indicating the importance of strategy execution in the digital transformation context. Chapter One identified this reference and the challenges encountered by a South African petrochemical organisation. In chapter two, the

literature review links strategy execution and digital transformation in South Africa, mentioning the key success and failure factors when dealing with strategy execution. The literature in chapter two also provided the groundwork for a theory relating to strategy execution and execution frameworks. The analysis of the results from chapter four and discussions from the results in chapter five were analysed and consolidated into creating a framework to arrive at Figure 6.1, which summarises the recommendations emerging from the study.

Figure 6. 1 - Digital transformation execution framework

Figure 1 indicates six factors that make up the framework.

The underlying premise of this framework is that a digital transformation strategy goal should be approached by considering multiple elements concurrently. To ensure the success of the framework, consistency must be shown across the execution elements for the strategy to be successful. The framework cannot be viable if one or more of the defining elements are not considered and not properly scoped within a digital transformation initiative. The importance of each element and how it should be included is explored below.

6.5.1 Organisational approach

Top management should ensure a clear purpose as it assists in forming the problem statement, goals and objectives. The purpose highlights the organisation's intention and helps overcome the silo mentality, leading to more focused and effective effort. Aligning the purpose is an organisational approach which leads to greater success of a digital transformation initiative. With a clear roadmap outlined by timelines, purpose and objectives. This allows for top management to coordinate the strategy of execution and better facilitates the decision-making when undertaking an implementation which is supported by

Additional to the organisation's approach, senior management need to consider effective execution requires the appropriate allocation of resources, both financial and human. To successfully achieve their digital transformation objectives, organisations must allocate a specific budget and ensure they have the appropriate personnel equipped with the requisite skills. This includes providing resources for training and development whilst also allowing for outsourced vendors to ensure staff has the skills necessary to successfully execute a digital project.

6.5.2 End-user buy-in

Empirical data suggest that organisations' product owners and project managers should prioritise the end user buy-in experience by including them in implementing new digital processes and systems. This is achieved by engaging with end-users early in the digital project. Ensuring they are accompanied on the journey by making them understand the importance of the changes and benefits. As end-users are accustomed to their old ways of working, ensuring this step reduces the risk of resistance to the new changes.

To ensure the success of the transition, organisations' product owners and project managers it is important to train and upskill end-users to gain the knowledge and skills required to adapt to the new processes and systems. In addition, the concerns and fears of the end-users must be addressed. Involving the end users in decision-making ensures they feel heard and valued. By doing so, a higher success rate for the implementation can be achieved as the end-users could be more willing to embrace the new process. This approach is aligned with the principles of

6.5.3 Tailormade solutions

To achieve a successful digital transformation, organisations' product owners and project managers must develop a tailored solution that meets the organisation's and its end-users needs. This can be achieved by involving end-users in developing goals and objectives. By doing so, an organisation can establish a culture of development and overall acceptance of the strategic goal. Having clear objectives and goals in place is crucial, as not having them can negatively impact the implementation process, resulting in the project losing strategic orientation and causing end-users to have no sense of urgency towards the strategic goal.

The involvement of end-users in the solution development phase contributes to the ease of following the right steps to implement a digital solution. Once an organisation has established these steps, the project benefits from the tailored solutions that arise. Therefore, to ensure a successful digital transformation, it is important to involve end-users in the development process to help tailor solutions that meet their needs and facilitate the overall adoption of new technologies and systems.

6.5.4 Innovation and experimentation

One key recommendation for management to consider for digital transformation is to foster a culture of experimentation and innovation within the organisation. Empirical evidence indicates that experimentation is crucial in addressing complex problems and improving efficiency in successfully implementing and delivering digital transformation initiatives. To facilitate this, the organisation should establish a sandbox environment to allow innovation to grow. Perhaps, experimentation needs to be adopted as the organisation's strategic decision, with failure being rewarded and people being allowed to stretch and innovate. Additionally, innovation needs a shared learning and experimentation culture to achieve digital transformation. Therefore, organisations should create an environment encouraging experimentation and innovation, focusing on shared learning and growth.

A key recommendation for successful digital transformation is to foster a culture of innovation and experimentation within the organisation. This involves encouraging employees to experiment and innovate to solve complex problems creatively. According to the empirical data, a culture of experimentation allows for a more

personalized and adaptive learning experience, leading to increased efficiency in the success and delivery of digital transformation initiatives.

To achieve this, organisations should establish a clear framework and process for experimentation and innovation and provide employees with the necessary resources and support to pursue new ideas. Additionally, it is important to celebrate and recognise innovative ideas and successes to reinforce the importance of innovation within the organisation. By fostering a culture of innovation and experimentation, organisations can better adapt to technological changes and stay ahead of the rapidly evolving digital landscape.

6.5.5 Change Management

To ensure the successful execution of digital transformation initiatives, it is recommended that product owners and project managers pay close attention to change management. Empirical data emphasised that resistance to change is often encountered when implementing digital transformation strategies. It is important to note that employee reluctance towards change can cause projects to revert to traditional methods, ultimately hindering the initiative's success. Therefore, organisations must ensure employees are on board with the changes implemented. One way to achieve this is through effective change management strategies that address employee concerns and provide adequate support throughout the implementation process. By proactively addressing resistance to change, organisations can ensure a smooth transition towards digital transformation.

6.5.6 Centralised decision making

Based on the empirical data, it is recommended that senior management should consider adopting a centralised decision-making approach to streamline the digital transformation strategy implementation. The current decentralised approach can result in divisions of the organisation pursuing different strategies and causing inconsistencies in the implementation process. Haque et al. (2019) support this recommendation by stating that a centralised decision-making body can provide a single overarching body aimed at managing initiatives and a single point of accountability, resulting in better coordination and efficient execution of strategies. Although some interview candidates prefer the decentralised approach due to its

autonomy and freedom, a centralised approach can offer more effective decision-making and ensure consistency in strategy implementation.

6.5.7 The hybrid approach for implementation

Based on the feedback from empirical data, it is recommended that top management adopt an agile methodology as the primary approach to digital transformation implementation. The candidates noted the flexibility and collaboration amongst key stakeholders and team members enable the implementation team to navigate changes whilst delivering on a project. This recommendation is supported by Peppard, Galliers and Thorogood (2014), who agree that agile methodology provides flexibility and creates more collaboration between team members to adapt to changing requirements.

However, it is acknowledged that there are still pockets of the organisation that use the waterfall implementation methodology. The respondents indicated that individuals still prefer to use this approach due to the traditional approach providing a more stable and less frantic approach to project implementations, particularly in complex projects where the organisation has experience adopting the waterfall approach. Adetokunbo and Basirat (2013) confirm the sequential nature of the waterfall methodology in its implementation activities, while Petersen, Wohlin and Baca (2009) state that the waterfall methodology follows a structured process approach.

Despite this, it is recommended that an agile approach be considered as the clear incremental-based implementation strategy. The overall view from the insights of the interview candidates was that an agile methodology would allow teams to solve problems and focus on achieving small incremental steps to achieve quick wins. This is confirmed by Wei et al. (2019), who indicate that agile methodology allows for flexibility for the organisation to focus on project requirements. Therefore, it is recommended that the organisation transition towards an agile approach to digital transformation implementation.

6.6 Methodological Implications of the Study

This study indicated that organisations making digital transformation transitions should know the execution strategies to implement their goals. In this disruptive era, organisations need to be agile in their implementation approach as their digitalisation is met with challenges. These challenges require a unique set of processes and

procedures to ensure the success of their implementations. Leaders and project implementers should utilise the following research findings:

- Organisations can use this research as a guideline to implement a successful digital transformation goal. Organisations can be effective in their implementations by using the recommendations stated.
- Organisations can utilise the research findings presented in this study to provide guidance in their change management processes and facilitate appropriate transitions for their respective organisations. The recommendations from a change management perspective could help guide employees to accept changes and ensure success far beyond the implementation.
- The organisation's leader can use this report's contents to focus their efforts on resource allocation and better fund digital transformation initiatives. By focusing on the key aspects of this report, leaders can justify a faster transition into digital transformation.
- Management can adopt a similar approach; based on the contents of this research, management can focus their efforts on understanding the impact on their environments. This can help management identify skills and development needed to institute change in their areas.

6.7 Limitations of the Study

The research identified the following limitations:

- The interviewer did not have adequate interview training, which may have impacted the results of the data collected. The research was limited to a small population group of 12 candidates from one organisation.
- Not all organisations in this industry were covered in South Africa, which could be a focus for future studies.
- This research was conducted in the Gauteng, Mpumalanga and Free State regions. Therefore, geographical bias could apply.
- The scope of the research was limited to senior management, functional specialists and digital consultants involved in digital transformation initiatives in the organisation. The research was restricted to senior management and did

not include lower management and operations levels involved in other aspects of digital transformation.

6.8 Recommendations for future research

Consideration for the following areas for future research in this study:

- The study focused on the views of senior management, middle managers and analysts in a petrochemical organisation. Further research would be required to validate findings for other organisations in the petrochemical industry.
- This research was conducted qualitatively to understand the key elements and facilitative factors to execute a digital transformation strategy. This research can be done quantitatively to cover a larger sample population. As well as cover more organisations in the industry.
- The scope of this study was limited to the execution of a digital transformation strategy in a South African organisation. Future research can expand the scope by comparing the execution of digital transformation strategies in international organisations.

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Appendices

Appendix 1 – Interview Guide

Wits Business School - An analysis of the execution of digital transformation strategy in a large petrochemical organisation in South Africa Interview Guide

Biographical Questions

1. All research participants' identities will be anonymised, so please provide me with a pseudonym you would prefer to use.
2. If you do not mind, How many years of experience do you have?
3. Which Business Unit and Department are you currently in?
4. What is your current level of study?
5. What is your current position in your department?

Section A: To establish the digital transformation execution strategy adopted by a petrochemical company.

1. What is your understanding of digital transformation strategy based on your experience?
2. In your experience, how difficult have you found the execution of digital transformation strategy goal?
3. How has your organisation approached digital transformation strategy?

Section B: To examine the factors influencing digital transformation strategy execution.

1. In your experience, what were the main facilitative factors that determined your undertaking of strategy implementation?
2. What are the driving forces that ensure the success of strategy execution?
3. What are the elements that hinder the success of strategy execution?

Section C: To assess the effectiveness of different strategy execution perspectives from different value chain players.

1. What are the different approaches to digital transformation strategy implementation?
2. To the best of your knowledge, how do different organisational divisions determine the digital transformation strategy implementation approach?
3. In your opinion, what are the common components of the various steps taken to strategy implementation relative to other divisions?

Section D: To propose a framework to enhance the execution of a digital transformation strategy.

1. How should management optimise the execution of a digital transformation strategy
2. How much do you weigh each item mentioned in terms of importance?

Appendix 2 – Consistency Matrix

Objective	Research question	Interview Question
To establish the digital transformation execution strategy adopted by a petrochemical company.	1. What are the digital transformation execution strategies adopted by a petrochemical company?	1. What is your understanding of digital transformation strategy based on your experience? 2. In your experience, how difficult have you found the execution of a digital transformation strategy goal? 3. How has your organisation approached digital transformation strategy?
To examine the factors influencing digital transformation strategy execution.	2. What are the factors influencing digital transformation execution strategy for petrochemical company?	1. In your experience, what were the main facilitative factors that determined your undertaking of strategy implementation? 2. What are the driving forces that ensure the success of strategy execution? 3. What are the elements that hinder the success of strategy execution?
To assess the effectiveness of different strategy execution perspectives from different value chain players.	3. What is the effectiveness of using different strategies in the execution perspectives of different value chains?	1. What are the different approaches to digital transformation strategy implementation? 2. To the best of your knowledge, how do different organisational

		divisions determine the digital transformation strategy implementation approach? 3. What are the common components of the various steps taken to strategy implementation relative to other divisions?
To propose a framework to enhance the execution of a digital transformation strategy.	4. What is the possible framework to enhance the execution of a digital transformation strategy?	1. How should management optimise the execution of a digital transformation strategy 2. How much do you weigh each item mentioned in importance?

Appendix 3 – Organisation permission letter

Date: 01/10/2022

To whom it may concern

Permission letter to conduct research

This letter serves to confirm that **Leelind Billett (01030565)** under supervision of **Dr. Fanny Saruchera from Wits Business School, University of the Witwatersrand**, may conduct research on the premises of Sasol and may make use of company data, as specified below. Furthermore, the data generated during the research may be used to compile a dissertation for the fulfilment of the degree **(MBA) Master's in Business Administration**

Sasol hereby agree to provide the necessary research support in the form of managerial and functional experience through interviews. An interview guide will be used to ask participants questions on their digital transformation experience and insights.

The researcher may make use of the following data:

- Gather information through an empirical study from a selected sample population of managers in Sasol across Business Units, limited to South African operations
- To establish the supply chain digital transformation execution strategy adopted by a petrochemicals company.
- To examine the factors influencing supply chain digital transformation strategy execution.
- To assess the effectiveness of different strategy execution perspectives from different value chains players.
- To propose a framework that will enhance the execution of a digital transformation strategy.

The data may be used on the following conditions:

- Answers from the sample population to be treated as confidential
- Proprietary information will not be disclosed
- Sasol's name will not be published in the research finding, reference can be made to a Petrochemical Company.

The researcher may access applicable areas within the organisation, if deemed necessary to conduct research for a dissertation, while adhering to Sasol policies.

Yours sincerely
Signed by: Chris Klopper
Signed at:2022-10-13 09:07:26 +02:00
Reason:I approve

Chris Klopper

Chris Klopper
Snr Manager – L & D
chris.klopper@sasol.com
082 903 5634

Appendix 4 – Interview Consent Form

Interview Consent Form

An analysis of the execution of digital transformation strategy in a large petrochemical organisation in South Africa

Researcher: Leelind Billett , MBA student at Wits Business School (WBS), University of Witwatersrand

I am conducting research on the analysis of the execution of digital transformation strategy in a large petrochemical organisation in South Africa. I am analysing the influencing and facilitative factors on the execution of digital transformation in the petrochemicals industry.

The interview is expected to last no longer than an hour. Your participation is voluntary and your identity will remain anonymous. The interview will be audio recorded for the benefit of the research paper in order to capture key points. The audio recording is voluntary and can be retracted at any time. All data captured will be kept confidential.

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

Leelind Billett	Dr Fanny Saruchera
389125@students.wits.ac.za	FannySaruchera@wits.ac.za
071 867 1292	067 187 8453

Participant Name: _____

Date: _____

Signature: _____

Researcher Name: _____

Date: _____

Signature: _____

Appendix 5 – Ethics approval

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/BA389125/990
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title	Execution of digital transformation strategy in a large petrochemical organisation in South Africa
Investigator / Researcher	Mr Leelind Billett
Nature of Project	MBA (Research Article)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	2022-09-01
Expiry date	Date of submission of the project / research report
Chairperson	Prof Anthony Stacey ☎ +27 11 717 3587 +27 82 880 4531 anthony.stacey@wits.ac.za

Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

01/09/2022
Date:

Appendix 6 – Language Editing Confirmation

EDITING CONFIRMATION

To whom it may concern:

This memo serves to confirm that the manuscript/research project detailed below has been language-edited and/or proof-read.

Regards,

-SM001-

S. Mpunz *(Cert. Lang. Ed.)*
Language Editor

****

Manuscript Title:

An analysis of the execution of digital transformation strategy in a large petrochemical organisation in South Africa

Author:

Leelind Billett

Issued on:

28/04/2023

Disclaimer:
The editor/proofreader makes no claim as to the accuracy of the manuscript contents nor the objectives of the author. While all possible efforts have been made to ensure the text as edited is readable and grammatically correct, the author(s) have the option to accept or reject suggestions and trackable changes made to the document before submission.

*** Professional Editors ***

sarchcot@gmail.com