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Implementation of digital transformation in a public entity

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

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DECLARATION

I, Kolwani Star Mokhabela, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Kolwani Star Mokhabela

Signed at Johannesburg

On the 28th day of February 2023.

ABSTRACT

Public entities strive to have digital transformation in their organisations; they strategise and organise themselves; however, they face challenges with implementation. This study aims to investigate the progress that one South African public entity (PE) has made towards digital transformation, the processes followed in implementing, unpack the challenges and recommend strategies that any public entity can use for better future implementations. A qualitative methodology was followed using semi-structured interviews conducted on a sample of fifteen participants within the public entity who are role players or have participated in digital transformation processes from executives, management and project team members. A thematic analysis of the data was made. Conclusions and recommendations were made around the capabilities and challenges of the public entity, integration of processes, performance measurement, IT skills and overall motivation for employee engagement and adoption of digital transformation and how all these phenomena have a close interaction with each other to achieve a better chance of success on future DT implementations.

Key Words: Digital, transformation, IT, systems, SCM, implementation, systems, public entity, processes, Finance, PMO

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LIST OF ACRONYMS

CFO	Chief Financial Officer
CIO	Chief Information Officer
DT	Digital Transformation
DTI	Digital Technology and Information Committee
FPMO	Finance Programme Management Office
GMIT	General Manager Information Technology
HR	Human Resources
ICT	Information Communication Technology
IT	Information Technology
KPI	Key Performance Indicator
OT	Operational Technology
PE	the Public Entity
SCM	Supply Chain Management
SLA	Service Level Agreements
BU	Business Unit/s

CHAPTER 1: INTRODUCTION

1.1. Digital Transformation Programmes

Digital transformation (DT) involves integrating digital technology into every area of an organisation, changing how it functions and delivers value to customers. It is still a developing field, especially in the public sector (Gong & Ribiere, 2021). Gruman (2016) defines DT as using digital technologies across business and society. According to Westerman et al. (2014), DT dramatically improves enterprise performance or reach using technology. A culture shift also forces organisations to question existing quo, experiment and accept failure (Kitsios & Kamariotou, 2021; Shreya, 2022).

Meijer (2015) emphasises the role of individuals in public entity transformation, social constructions, behaviours, attitudes, and cognition of individual actors in transformational change, and how their behaviours affect systems they are involved in. This covers how they affect change and how individual interests, attitudes, perspectives, and local and institutional settings affect public administration (Mergel et al., 2019).

1.2. Study Context

Heavin and Power (2018) say most companies need DT to survive. Hence, in 2020, a public entity's finance team reassessed its strategy and decided to create a Finance Programme Management Office (FPMO) to house and see to the delivery of Digital transformation necessary to improve PE's Finance processes. The FPMO was established in consideration of one of PE's values of “spirit of partnership” with key business partners embedded within the FPMO. This approach was also supported by one of the Project Management Body of Knowledge (PMBOK) principles of Project Integration Management, considered as the principle that holds a project together, ensuring proper coordination of various elements and processes across inter-dependant departments.

1.3. Purpose of the Study

This research aims to obtain an in-depth understanding and assessment of the implementation process that a public entity undergoes when implementing its DT programme. This includes assessing the progress and identifying key challenges that PE faces and to present strategies to aid PE's successful implementation of DT. According to Zachari (2022) and Vial (2019), this study answers a call from the body of knowledge on how public administrations define DT in their day-to-day operations, how they approach implementing DT projects, and what can be done to improve the likelihood of success.

1.4. Problem Statement

In 2013, PE's finance BU launched the "Chief Financial Officer (CFO) Programme" alongside PE's IT department (IT) which was a 5 year strategy to implement several digital systems to address various finance process issues and this CFO programme has resulted in years of delays; Company PE, The CFO IT Programme Report, Unpublished confidential document (2013). According to Heavin and Power (2018), many phenomena are responsible. This study examined the issues that caused years of delays and failed implementation rollouts. In 2020, the FPMO was established, creating a space to track progress towards DT with much dedicated focus to fast-track implementation; Company PE, FPMO Maturity Assessment Close out Report, Unpublished confidential document (2021).

Cichosz et al. (2020) found that the complexity of the system and processes, lack of skills and resources, technology adoption, resistance to change and data protection are the five main challenges in implementing DT. Ivančić et al. (2019) established seven dimensions of DT being; strategy, people, organisation, customer, ecosystem, technology, and innovation. Vamvakidis (2018), on the other hand, identified that cross-functional information communication technology (ICT) utilisation, cross-functional re-skilling and the integration of the business and IT strategy as being the main pillars of a successful DT. This research, therefore, expands on the real-life experiences of implementation of DT, specifically within the context of public sector processes, policies and leadership, to systematically unpack what phenomena

contribute to the hindrances and success factors and propose solutions that can contribute towards better implementation.

1.5. Research Questions

1) How does the public entity implement Digital Transformation?
2) What challenges face the public entity during the implementation of Digital Transformation?
3) What changes are required within the public entity to successfully implement Digital Transformation?
4) What strategies can be adopted within the public entity to successfully implement Digital Transformation?

1.6. Assumptions

DT programmes, specifically in public entities, have challenges in implementation, which leads to slower progress against fast-paced technological advancements in the industry; and SCM, Finance environment and IT processes in public entities of South Africa are governed by similar regulatory frameworks and therefore face similar processes.

1.7. Delimitations

Delimitations were made in the selection of the interviewees, limiting to not more than two interviewees representing a particular area of implementation. According to Jahja et al. (2021), qualitative research concerns individuals' perceptions of reality based on the use of purposive sampling. Delimitations have also been made in the choice of topic, limiting the exploration to implementation challenges; deliberately excluding the strategy formation of the DT programs, as strategy development has not proven to be a challenge in PE, but implementation is. The exploration of implementation is delimited to aspects of leadership, people, technology, processes, SCM processes used to source systems and implementation partners and project management processes. Although greater emphasis is placed on implementation, the report does touch on change management and funding aspects as these are key enablers to transformation.

1.8. Significance of study

The expected benefits of DT are known, and entities have shown a willingness to transform by incorporating DT into their strategies, but there is little literature on how these transformations are implemented, especially from a public sector perspective (Ahn & Chen, 2022; Mergel et al., 2019; Papavasiliou, 2020; Vial, 2019). This qualitative study examines PE's transformation journey. It evaluates current implementation methods based on stakeholders' past project implementation experiences. To identify accomplishments, obstacles, gaps, and weaknesses and all phenomenon that has slowed implementation. SCM processes, senior management assistance in execution, personnel skill and capacities, infrastructure, and operational environment and culture enablement are examined.

The research takes a comprehensive approach to major implementation issues to comprehend the numerous phenomena at play in the public realm methodically, unpack them separately, and analyse whether they are interrelated. This helps identify significant themes in the issues faced to be resolved and offers strategic methods that could improve implementation in the context of public sector entities.

The study presents a holistic picture of PE's challenges; the paper proposes recommendations to drive the turnaround. This could provide a better chance of success for PE as it embarks on a DT journey. This contributes to the growing body of knowledge related to implementation and also specific to the public sector. Benefits could be derived by other public entities to perhaps avoid common pitfalls with recommendations to direct their efforts appropriately in their DT journey.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The digital age has presented public entities with new obstacles and opportunities. The public sector is transforming due to digital technologies impact on their cultural and organisational components. Even though many academics have examined DT phenomena, the public sector and the elements that either inhibit or enable DT have received much less attention. This literature review looks at research that exists by other researchers and provides business cases for implementing DT programmes in public entities.

2.2. Digital Transformation Overview

Mergel et al. (2019) observed that DT in its fullest form results in the creation of entirely new business models that replace existing ways of delivering services, such as the taxi services now delivered by any ordinary driver using Uber as a service to connect to clients via a mobile phone app. According to Porter and Heppelmann (2014), advanced digitalisation capabilities can provide scope for “new functionality, higher reliability, greater efficiency, and optimization opportunities” to increase the value delivered to customers (Porter & Heppelmann, 2014:82). According to Heaven and Power (2018), DT is envisaged as a solution to organisational challenges of efficiencies and effectiveness. With this understanding, DT is at the core of the Finance strategy as the finance team in PE is continuously seeking improvement areas, striving for cost-effectiveness and process efficiencies in all finance processes to remain agile and efficient as a key strategic support business unit while driving value for the customer.

2.3. Digital Transformation implementation

2.3.1. Digital Transformation in Public Entities

Kraus et al. (2022) highlight the rise in publications dedicated to DT in business and management publications and demonstrate the infancy of the DT body of knowledge in a developing country context and also from a public sector point of view (Hai et al., 2021; Ries et al., 2018). For decades, public entities have utilised technology to

modernise the public sector (Johansson, 2022). Over the past five years, many developing nations have asked for World Bank assistance to construct more sophisticated DT projects (Cem et al., 2021). These programmes promote public entity efficiency and enhance the accessibility and quality of service delivery, strengthen government-to-citizen and government-to-business communications, improve governance and oversight, and modernise key public entity processes (Curtis, 2019; Danielsen et al., 2022; Sichaanji, 2022; Tangi, 2021).

The pandemic caused public entities to accelerate DT (Agostino et al. 2021) and to combine two distinct DT methodologies (Norling et al. 2022). In 2020, public entities across the world reduced their emphasis on organisational capacities and increased their emphasis on technical capabilities – in response to social distancing requirements (Pittaway & Montazemi, 2020). However, in 2021, those same entities changed to a strategy that placed greater emphasis on organisational capabilities and less on technological capabilities (Norling et al., 2022). This switching demonstrates the dynamic nature of the interplay between organisational and technological capabilities due to changes in the business environment (Gangneux & Joss, 2022).

2.3.2. Reframing Digital Transformation

Jonathan (2020) provides a systematic approach to DT, which provides an understanding of multiple aspects that are interconnected, and need to be managed simultaneously; Strategic objectives, Operational excellence, Operational architecture, Business case development and Solutions selection. All aspects are interconnected initiatives organisations must manage simultaneously (Modiba, 2020).

This is consistent with research analysis done in the logistics industry by Cichosz et al. (2020). Their analysis found that there were five main areas of challenges that the logistics industries face when implementing DT programs; (1) complexity of the logistics system and underlying processes, (2) lack of resources and skill, (3) technology adoption, (4) resistance to change and (5) data protection. Both studies conclude that the critical success factors of DT are not limited to technology, and neither is resistance the top barrier. However, other phenomena are at play simultaneously, which may overtake these and lead to implementation failure.

Ivančić et al. (2019) established seven dimensions of DT, enabling us to identify seven dimensions of DT – strategy, people, organisation, customer, ecosystem, technology, and innovation. Vamvakidis (2018) identified cross-functional ICT utilisation, cross-functional re-skilling and the integration of the business and IT strategy as the main pillars of a successful DT. These findings were confirmed by Pittaway and Montazemi (2020) and Ahn and Chen (2022) in PE's context.

2.4. Challenges of implementing Digital Transformation

Strategy challenges highlighted from literature is when top management is not on the same page. it makes it difficult for lower management to agree on prioritisation and how progress will be measured, however with clearly defined opportunities, the problem it solves and how the organisation will rearrange itself around the envisaged solution upfront (Schneider & Kokshagina, 2021; Zachari, 2022).

On issues of capabilities for scaling up, Sutcliff et al. (2019) explains the divide between the digital capabilities supporting the pilot and the capabilities available to support scaling it. Remedial actions are to seek external capabilities to close this gap, nurture the pilots in-house, and build digital capabilities for ramping up right from the beginning (Sutcliff et al., 2019). Tsolkanakis (2022) called these barriers structural barriers, including lack of managerial and political support, lack of available skills or a shortage of personnel. He also noted the increased organisational complexity and lack of coordination among the different BUs as key structural factors inhibiting the operationalising of a digital pilot.

Most barriers that stand in the way of a transformational attempt in a public entity are typically cultural in origin (Aidanpää & Sjöberg, 2021). More specifically, the majority of the obstacles discovered can fall into two categories: resistance to change and bureaucratic culture (Nwozor et al., 2022). Tsolkanakis (2020) found fear of innovation, a lack of internal leadership, internal dissatisfaction about the status quo and expected benefits for the additional work. Therefore particular attention needs to be given to the change management processes, particularly as it relates to all the people who will need

to adopt, implement and use the requisite digital interventions as well as overcoming bearocracy in implementation processes and decision making,

Organisational restructuring is centred on middle management, however, while upper management regulates the level and rate of change, middle management is responsible for implementation (Paavola, 2020). One may therefore conclude that middle managers constitute the lynchpin of digital change. In a “digitally changed” organisation, middle management's administrative and leadership responsibilities are expected to undergo a radical transformation (Hyvönen, 2018). As they transition from directing and controlling stable processes and people in the middle of the hierarchy to managing resources and connecting people in the middle of networks, middle managers must adopt a new mindset (Zuiderwijk et al., 2021). In the digital era, middle managers must encourage, enable, and coach their employees using digital tools. They are thought to facilitate the organisation’s DT (Paavola, 2020).

However, middle managers are frequently least likely to promote change due to their innate risk aversion, lack of entrepreneurial spirit, and strong adherence to functional routines. In addition, middle managers’ “sandwich” position between senior management and the operational level can make them susceptible to stress. How can middle managers be expected to propel DT forward? Entities must review their middle managers' digital abilities and literacy (Jonathan, 2020). How familiar are they with digital technologies, social media, the cloud, and other such developments? The reality is that middle managers may be unable to perform their coaching and leadership responsibilities if they struggle with technology themselves (Modiba, 2020).

2.5. Opportunities within successful Digital Transformation

In PE study, Ndou (2004) found that developing basic infrastructure is important to capture the advantages of technologies and communications tools to implement eGovernment (Ndou, 2004). ICT infrastructure requires telecommunication and computer equipment; education on *E-readiness* and *ICT literacy* are also necessary to benefit from eGovernment applications (Jonathan, 2020). In the *Gyandoot project,* the poor infrastructure facilities and lack of education on the infrastructure were major problems encountered in developing and implementing the project (Ndou, 2004).

Without the necessary technology, DT efforts will lag expectations (Norling et al., 2022; Tangi, 2021).

Despite the high failure rates and the need for additional research, DT in the public sector, particularly in the context of poor countries, is rarely explored (Mu & Wang, 2022; Syed et al., 2022; Tangi, 2021). While there is research on the effectiveness of DT in the public sector, studies on the causes of failure in the public sector of developing countries are uncommon (Zachari, 2022). Thus, failure studies in this setting might offer a unique perspective and the chance to gain fresh insights as lessons are learnt. Syed et al. (2022) study confirmed the relevance of common failure factors in the context of DTs in developing country's public sectors contexts, such as senior management's involvement, communication, shared vision, technology awareness, staff resistance, employee skillsets, rigid bureaucracy, empowerment, and stakeholder engagement. The findings also explained novel context-specific features (e.g., inter-department conflicts and lack of trust in the Implementation department).

In developing nations, public entities must thus put in place procedures to overcome difficulties with leadership, culture, organisational characteristics, and department-specific issues (Pittaway & Montazemi, 2020). The research conducted by Syed et al. (2022) reveals that the primary focus should be on enhancing leadership competencies since this can either exacerbate or mitigate the issues associated with the other components.

2.6. Strategies for successful Digital Transformation implementation

Public entities have encountered difficulty with DT, but the Covid-19 pandemic has hastened the changeover (Tangi, 2021). While legacy architecture and infrastructure remain difficult, people's mentalities are frequently the greatest obstacle (Pittaway & Montazemi, 2020). Any DT programme must prioritise delivering real, value-creating outcomes for PE and the public. A clear DT plan has proven to be a barrier for the public sector. Due to several variables, such as ineffective risk management; difficulty in attracting, keeping, and developing people; slower governance processes; and less

pressure to provide minimum viable products, public sector ventures are more likely to surpass initial cost and time projections. Through this literature review, many important strategies have become apparent that may assist the public sector in delivering initiatives that benefit the customer while increasing productivity and efficiency. See list in Table G.2.

When designing digital strategy, PE must account for the desires of customers and clients (Kitsios & Kamariotou, 2021; Shreya, 2022), and care must be taken to hire qualified candidates who meet the current skill needs (Davenport & Westerman, 2018; Meyerhoff Nielsen, 2019). Similarly, the budget for research and development of DT systems should be sufficient/increased (Gong & Ribiere, 2021; Manda & Backhouse, 2017). Leaders must also prioritise participating in seminars and conferences concerning DT (Zachari, 2022).

The strategy must be practical by developing corporate policies that support DT (Benjamin & Potts, 2018; Schneider & Kokshagina, 2021). The suggestion is made to consult other businesses that have effectively adopted DT for guidance (Kraus et al., 2021; Jonathan, 2020). While some advocate for the bold abandonment of old technologies and adoption of DT (Agostino et al., 2021; Johansson, 2022), leaders are cautioned to maintain two parallel systems when experimenting with DT (Agostino et al., 2021). As all these changes are happening, it is important to maintain open communication channels between IT and other departments (Papavasiliou, 2020; Syed et al., 2022). Another key factor is creating an R&D team for DT systems (Goh & Arenas, 2020; Nadkarni & Prügl, 2021) with the caveat that providers of DT solutions are selected with care (Cem et al., 2021). PE and technology department must enhance the cybersecurity of e-systems (Mergel et al., 2019) and use data analytics to improve firms' existing digital systems (Goh & Arenas, 2020; Hai et al., 2021). It is also important to develop digital solutions that are interoperable with other digital systems (Ahn & Chen, 2022; Reis et al., 2018).

From a cultural stance, leaders need to convince employees to be receptive to DT (Norling et al., 2022; Zuiderwijk et al., 2021) and develop the capacity to identify and conceive DT methods (Gangneux & Joss, 2022; Press et al., 2021). Leaders must be adaptable to garner employees' support (Kraus et al., 2022). This will also have

positive effects on the people who are expected to adopt digital technologies. Further, leaders are reminded to properly instruct staff on applying DT technologies (Danielsen et al., 2022; Tsolkanakis, 2022) and enhance the capacity to quickly adopt emerging digital business technology (Brown & Brown, 2019; Sichaanji, 2022).

In internal company DT initiatives, the customers are the internal employees, and it is important to secure their buy-in. Two factors include using successful digital technology that practitioners truly desire (Cichosz et al., 2020; Gomez-Trujillo & Gonzalez-Perez, 2021) and developing user-friendly digital systems (Nwozor et al., 2022; Sutcliff et al., 2019).

2.7. Analytical Framework

DT is frequently cited as a key strategic tool for firms seeking to compete, innovate, and expand in the current market. However, as more and more companies in the private sector adopt digital technologies, redefining customer experiences and having a significant impact on people's expectations for instantly accessible information, buffet-style service delivery, and limitless configurability, public entities struggle to keep up. Suppose public entities are willing to develop a robust digital strategy and infrastructure that supports new technologies and high-quality digital services. In that case, they will be well-equipped to undertake DT initiatives.

2.7.1. Conceptual framework

Research on developing well-founded cross-industry DT frameworks/models is still nascent (Brown & Brown, 2019). To add to the body of knowledge around this gap, a literature analysis by Bumann and Peter (2019) considered almost a hundred articles on digital transformation maturity models and frameworks. Only those from publications with peer review and where the dimensions were validated through research were chosen for further study. This produced eighteen articles in total. The relevant authors must present a comprehensive maturity model or framework for a framework to be deemed significant for the comparative analysis. In addition, the framework is required to originate from scholars or reputable organisations, such as multinational consulting firms.

Bumann and Peter (2019) found eighteen validated digital maturity models and frameworks that explain numerous dimensions or action areas to be considered when developing a DT plan to give management an overview of essential problems. The eighteen selected models and frameworks have 115 dimensions (six on average per model/framework). The most frequently cited ones were strategy, the organisation, corporate culture, technology, the client, and people (employees). The six highlighted dimensions/action fields provide an essential framework for the digital transformation success of enterprises, see Figure 2.1. This is the framework that was used in this study.

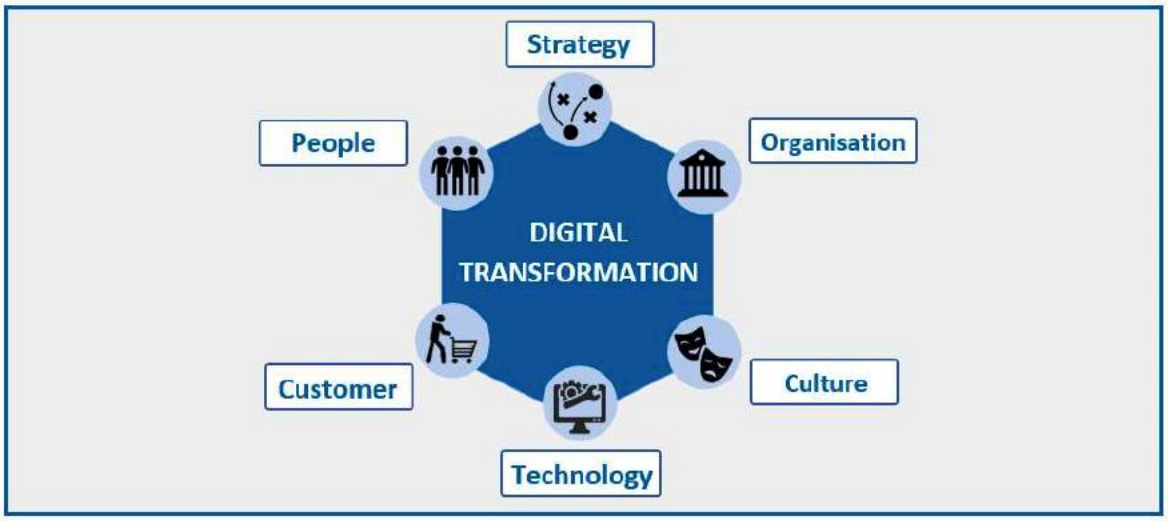


Figure 2.1: Digital Transformation Framework

Source: Bumann & Peter, 2019:25.

2.8. Chapter Conclusion

During COVID-19, numerous public entities expanded their DT initiatives in response to the needs and external drivers that emerged or escalated. They have discovered that they can affect more rapid transformation than they previously believed feasible. Public entities could utilise this knowledge to commit to a more rapid DT. As public sector companies engaged in their DT, the lessons acquired over the past and strategies from literature can help them do so wisely in future, moving well beyond "doing digital" projects to "being digital" in every way.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Research approach

This study used a qualitative mono-method to collect and analyse data (Saunders et al., 2019). This is because the research delves deeper into the challenges within a public entity currently implementing a DT program. Qualitative research answers "how" and "why" questions about complicated phenomena (Shenton, 2004). Qualitative research starts with open-ended questions, data is collected within the participants setting, and data analysis is made from statements made, which are built into general themes upon which the researcher makes interpretations and conclusions (Creswell, 2007).

The study explored the implementation of DT, making qualitative research methodology the most appropriate method for this research. Exploratory investigations allow researchers to comprehend a topic and gather insights in a flexible and adaptive approach by starting with a broad focus and narrowing it down (Leedy & Ormrod, 2018). This study considered the different experiences of senior management across key processes, from SCM policies in the selection of implementation partners, project management, infrastructure compatibility and availability of technical expertise, for DT success.

3.2. Research design

The type of study determines how the research design is planned. The qualitative case study design used is, explorative, descriptive, and contextual (Leedy & Ormrod, 2018). Explorative and descriptive as the intention was to find out about PEs progress towards DT and its implementation processes by exploring the multiple processes as well as across various level of seniority and participants describe the multiple phenomenas that existed based on their experiences. This study was also contextual as the DT experiences described by participants was within the context of a public sector entity but also within the context of their individual experiences and not intended for generalisation (Oates et al., 2022). Data was collected and the observations were used to inductively reveal the challenges and changes required in implementing a DT program.

3.3. Population

This research focused on a public entity. The public entity is currently focused on implementing technological and digital changes across the organisation and continuously attempts to remain agile and efficient. The target population for this research is the employees of the public entity; specifically, the executives, management and project members involved in DT programmes will be interviewed as part of this study. This population share research-relevant traits (Guest et al., 2006).

3.4. Sample and Sampling Method

Sampling is picking a subset to reflect the accessible population (Leedy & Ormrod, 2018). Purposive population sampling was used to answer the study question (Saunders et al., 2019). Purposive sampling involves a deliberate selection of people, selective experts and management and executive participants (Jahja et al., 2021). Experts from different BUs are engaged to share their in-depth DT experiences to unravel the challenges on the ground. The purposive sampling method is more appropriate for qualitative research than random sampling due to the indepth specifics required to understand the challenges; only knowledgeable and experienced individuals will contribute positively towards this.

Qualitative research uses sufficiency and saturation to estimate sample size (Bryman, 2016). The saturation and sample size were determined by data quality, the study scope, issue clarity, and ease of data collection (Guetterman, 2015). A sample size of six to twelve is appropriate for purposive sampling in qualitative research (Guest et al., 2006). This study had a sample size of 15, comprised of participants selected based on their close interaction and expert knowledge of the DT programmes (Jahja et al., 2021). Qualitative research can use a small sample to obtain in-depth information, however 15 was necessary to eliminate bias and increased data wealth. Beyond these identified participants, no further new information will be obtained, this according to Jahja et al (2021) is an indication of the saturation point having been reached, in this case being fifteen.

3.5. The Research Instrument

In order to study the experiences of PE, in-depth interviews were considered the most appropriate research instrument to abstract a wealth of experiences as witnessed by the various stakeholders involved in implementation processes (Mojtahed et al., 2014). An interview guide was followed to ensure the research questions were addressed (McGrath et al., 2019). The questions were open-ended, and in order to provide rich data, further probing to allow the exploration of all phenomena existing and to obtain individual perceptions, opinions and new insights on the various topics of discussion (Bryman, 2016; Kahlke, 2014; Ryan et al., 2007).

3.6. Procedure for data collection

An email with a cover letter inviting participants to participate in this research (Appendix A) was sent out with research information, the organisational approval (Appendix C), and the main study objectives. Once the participants accepted the invitation, a participant consent form was shared (Appendix B). The Interview guide (Appendix D) was provided upfront to ensure participants could prepare for the interview. All interviews were conducted on digital meeting platforms, Teams and Zoom, as PE was operating on a hybrid working model. Permission to record the sessions was requested and obtained from participants at the start of the interview (McGrath et al., 2019; Saarijärvi & Bratt, 2021). Extracts from three sample transcripts are included in Appendix H, I and J.

3.7. Data Analysis and Interpretation

Thematic analysis was used for the data analysis. Thematic analysis is a qualitative foundation used to search and identify themes or patterns in data (Saunders et al., 2019). Each interview recording was transcribed verbatim after data collection. The data was analysed and classified into systematic categories (Kleinheksel et al., 2020). The data was analysed using Creswell's six phases of data analysis (in a bottom-up method), namely organisation (step 1), re-checking (step 2), coding (step 3), creating themes (step 4), describing themes (step 5) and interpreting findings (step 6) (Creswell, 2007).

1. During the first step, qualitative data was generated by transcribing interviews and uploading them into a password-protected computer.
2. Next, the researcher gained a comprehensive understanding of the information and thought on its overall significance, such as the general opinions of the participants, the tone of their ideas, the overall precise meaning, and the information's reliability.
3. Following Creswell's processes for coding, where text is classified with comparable meanings (Creswell, 2007), the researcher internalised knowledge by carefully editing transcripts and noting ideas that arose while reading. After reviewing the perspectives of multiple participants, the researcher grouped comparable topics, categorised them and generated themes and subthemes for each category. Codes were given to the appropriate sections of the text the appearance of new subjects or codes were assessed. A descriptive term for each topic was given and categorised accordingly. Similarities were clustered and interrelationships formed. Next, abbreviations for each group were made and codes were alphabetised. The researcher compiled data related to each category in a single location.
4. Fourth step used coding to generate topics for analysis and description.
5. Themes were depicted and articulated using narrative passages and tables and
6. Finally step 6 analysing the real perception of what transpired and the lessons acquired based on the various answers and experiences.

3.8. Quality

3.8.1. Trustworthiness

Trustworthiness requires a thorough and rigorous description of all study methods (Bryman, 2016). These are credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1986). Multiple stakeholders were interviewed to ensure that the data is dependable as it provides a better representation of the opinions and not solely on individual bias or the researcher’s preconceived ideas.

3.8.2. Credibility

Credibility, like internal validity in quantitative research, shows trustworthiness (Lincoln & Guba, 1986). The findings in this study were corroborated between participant transcripts coming from various aspects of the PE's DT Implementation process, with the right level of seniority and experience to strengthen the results. The researcher engaged the data by analysing interview transcripts to construct a theory about the phenomena (Guest et al., 2006). The researcher accurately documented and analysed participant data to increase reliability (Morse, 2015).

3.8.3. Transferability

Applicability improves transferability (Tracy, 2010). Participants are described and study process undertaken so the reader may decide if the findings apply to them (Ryan et al., 2007). The researcher also describes the research setting, sampling frame, sample size, and strategy (Kahlke, 2014). During data analysis, the researcher used exact coding to ensure descriptive findings that can be applied to similar situations and benefit future research (Morse, 2015).

3.8.4. Dependability

Dependability concerns consistency (Lincoln & Guba, 1986). The researcher documented and followed a questionnaire guide consistently across all participants, documenting all research steps, decisions, analysis, and interpretations to ensure consistency. Transcripts and recordings can be audited via a trail (Tracy, 2010). The Interview guide was applied consistently across varying participants. The Interview guide can easily be repeated in another setting or Public entity.

3.8.5. Confirmability

McGrath et al. (2019) say confirmability involves neutrality. The researcher must ensure intersubjective data, i.e., the data should be interpreted, not the researcher's preferences (Morse, 2015). Interpretation within the analysis is the focus here. As Creswell (2007) noted, the researcher must manage their biases towards the study. This study comprised of participants from varying fields of disciplines, at various levels

of management, the repetition of the same interview guide provided multi-dimensional views for comparison and wealth of data to enhance findings.

3.9. Ethical Considerations

To prevent plagiarism, all authors whose works have been examined and cited have been recognised. Before conducting the research, all ethical requirements were complied with and an ethical approval from the Wits Business School Ethics Committee was acquired (see Annexure E). Written request letters were made and authorisation to conduct research were obtained (Annexure C).

One of the ethical requirements in a research study is for the participant's rights to information and data privacy. When individuals share information with researchers, the researcher must ask permission from the participant before they can share the information with anyone; as such, participants had to give consent before being interviewed (Annexure E).

Participants were informed that their participation was optional and that they could withdraw at any moment, and each interview began with participants' verbal consent to record (Ryan et al., 2007). Participants were told they did not have to disclose any information if it made them uncomfortable (Shenton, 2004). Care was taken that participants' privacy, dignity, and reputation were always respected (Bryman, 2016).

Participant identities were kept confidential, with transcripts and all quotes in the final report anonymised. Recordings, transcripts and field notes were stored on a password-protected computer, and only the researcher had access. The data will be stored for five years and deleted after that.

CHAPTER 4: ANALYSIS OF STUDY RESULTS

4.1. Introduction

The objective of this study is to explore the implementation processes and progress being made in PE's execution of DT, unpacking the systematic challenges and gains made across entire implementation value chain, and establish a framework for any public entity that may result in better future implementations. The findings of the empirical data from the interview transcripts were analysed and presented in a particular order starting with the profile of the respondents, the relevance of empirical data, a discussion of the themes of the study, and finally, answering the research questions.

4.2. Overview of the study sample

The 15 participants interviewed were from different specialities, including IT at different levels, such as IT executive manager, senior manager and other members of IT teams (Table 4.1). Interviewees from finance, included an executive, FPMO and senior finance managers. Members of SCM, change management, operations technology strategy and steering committes were interviwed . The team was diverse, representing multiple functions, and it confirmed an effective purposive sample (Leedy & Ormrod, 2018) and had relevant experience in DT see Table 4.1.

Table 4.1: The speciality and relevant experience of the participants in Digital transformations

Speciality	Relevance of Experience in Digital Transformation
Finance PMO	Head of Finance Programme Management driving digital transformation in Finance
Change Management	User adoption, communication and change management
Strategy and Steerco Chairperson	Creation of enterprise PMO and governance of steering committees
IT Project Team	Day-to-day project management
Finance Senior Manager	Process Owner for Finance systems projects
IT Executive	Sponsor of Finance Digital Transformation Programme
IT Project Team	Day-to-day project management:
IT Senior Manager	Senior Manager Project Execution
Finance Executive	Owner of Finance Digital Transformation Programme
IT Executive	Chief Information Officer (CIO) accountable for IT and Operational Technology (OT)
Finance PMO	Finance Programme Management Office Day-to-day progress of the CFO Program
Finance Manager	Business user and Functional lead for Finance systems projects
SCM Senior Manager	Sourcing of Systems, service providers, infrastructure
Business User	Business users requiring efficiencies and enhancements
OT Senior Manager	Senior Manager Operations Technology

4.2.1. Relevance of the empirical data

The word list from Atlas.ti 22 was used to determine the relevance of data and alignment of data across all interviews with the purpose of the study. The dominant words were training, leadership, leaders, change, technology, mining, skills, future, management, and technologies. These words were prevalent across all interviews and aligned with the study. The relevance of the empirical data and interviews is essential for credibility and rigour of findings (Guetterman, 2015).

4.3. Themes of the study

There were four research questions in the study to inductively investigate the implementation of DT within the company. A total of 243 codes were generated from the transcripts, and 24 sub-themes were generated, divided into nine themes, see Table 4.2.

Table 4.2: The research questions, sub-themes, and themes of the study

Research questions	Sub-themes	Themes
RQ1 How does the public entity implement Digital Transformation	Digital disruption of industries	Theme 1: Overview of digital transformation
	Company's digital transformation	
	Key drivers of digital development	
	Key role players	Theme 2: Implementation of digital transformation in an organisation
	Critical processes within an organisation for digital transformation	
	Organisations' capacity to implement digital transformation	Theme 3: Measuring capacity and implementation of digital transformation
	Organisations progress with digital transformation	
RQ2 What challenges face the public entity during the implementation of Digital Transformation	Employee availability and engagement	Theme 4: Workforce challenges in implementation
	Digital competence management	
	Customer ability to adapt to digital transformation	Theme 5: Organisational IT competency and customer adaptability to digital transformation
	IT competency to implement digital transformation	
	IT skill set and integration of IT processes in leading digital transformation	
	Organisational capacity to measure performance in digital transformation	

Research questions	Sub-themes	Themes
RQ3 What changes are required within the public entity to successfully implement Digital Transformation	Changes in company strategy	Theme 6: Company changes required and implemented for digital transformation
	Changes in internal processes	
	Changes in investments for digital transformation	
	Ensuring adaptation and embedded changes	Theme 7: Managing organisational changes for digital transformation
	Measuring performance and maturity levels towards digital transformation	
	Impact on internal and external processes	Theme 8: Digital transformation outcome impact on the organisation
	Impact on channels and services offerings for customers vs intended customer benefits	
RQ4 What strategies can be adopted within the public entity to successfully implement Digital Transformation?	Sourcing external partnerships for digital organisational transformation	Theme 9: Establishing key external partnerships
	Supporting key stakeholders Using IT	
	Incentivising for active participation	

4.4. Implementation of Digital Transformation by the public entity

The first research question was how does PE implement Digital Transformation? Three themes answered this research question: the Overview of DT, Implementation of DT in an organisation and Measuring the capacity of DT.

4.4.1. Digital disruption of industries and company's digital transformation

4.4.1.1. Industry digital development

Most PE participants are aware of continuous digital growth, some of which has occurred internationally, in their industry, and specific towns. SMART utility concepts, satellite technologies, IT-OT convergence, and eGovernment activities using Estonia as a model were noted. Yet, some participants believed that rules were slowing digital advancement in their public institutions compared to the industry and international digital disruptions. Several participants thought the DT was developing slowly due to South Africa's climate, politics, and economy, which also affected the industry's feasibility. Yet, other participants stated that the pandemic forced industries to speed up and adapt better to DT to sustain corporate operations. Participants also found that digital development varied by industry and company. Several participants saw industrial progress, but not enough to call it DT.

> *However, the regulatory environment is one of the contributing factors that, you know, contribute to the slow pace of digital transformation. But when it comes to digital disruption, I think pre-pandemic, there was a more relaxed approach to digital transformation. PAT2*
>
> *So my perspective on, if you know, moving from an international perspective and now bringing it home to our environment, is that there has been very slow adoption, you know, from an African context point of view. PAT3*
>
> *I don't know all the details because I'm obviously not privy to everything, but with whatever small engagements I've had, I've seen that they are making a move. However, unfortunately, the level of progress is not the same within the industry. PAT4*

4.4.1.2. Digital transformation within the public entity

Most participants said there was an ongoing DT within PE; however, how the DTs manifested within the BUs differed. Some DTs included implementing systems that would automate manual activities and enhance business efficiencies. The automation of these manual activities in some BUs was ahead, mainly focused on the finance BU, leaving other departments to catch up on the DT. The finance BU had dedicated structures to drive innovation and DT within their space, which helped with the progress. At a company level, some participants felt that although there was DT within PE, the implementation of these digital systems took some time. On issues of piloting new technology, progress is seen somewhat at a small scale, and the participants felt that if the innovation hub, operational IT and the BUs communicated better, the transformation and scaling up would take place with better success and impact on service delivery that is effective and efficient.

> *So, from an organisation point of view, there is even a committee that focuses on basically IT (Information technology) and the innovation component is there. So that committee is formed, but also lately there is, in our organisation, an appointment of a CIO. Which has been hired to manage both IT and OT. PAT5*

> *We are running digital transformation in my space with the recent project obviously, that we have been currently doing, where we are implementing a planning tool basically for the organisation. PAT12*

> *So, from that perspective, yes, I do think that there is an intent. However, I'm not too sure as yet how far we are with the implementation. So, as we then move into this disruptive space of digital technology and digital transformation, we cannot do it without also maintaining and improving our mandate. PAT15*

4.4.1.3. Key drivers of Digital transformation

The key drivers of DT from the participants' perspective mainly revolved around the business' need to drive business objectives and goals efficiently; through automation of processes, easier information dissemination, effective cost management with transparent systems that are easily accessible and user-friendly. Other key drivers of DT were understanding the customer experience and expectations. Since finance is at

the centre of business operations support, some participants also felt it was a key driver for much of the DT. The external drivers of DT were politics, the economy and customer needs, which is highly depended on what was happening in society, such as the pandemic. Some of the mentioned drivers of DT were innovative technologies that addressed risk mitigation from PE's strategy and how compliance to regulations could be implemented or automated. The last-mentioned drivers of DT was transparency because it was needed to improve monitoring and assessment or evaluation of the business.

> *We become more time conscious in undertaking certain, you know, activities. As a result, because then you're trying to address mundane problems, and the customer requirements, all you know, is that you need real-time information. PAT9*
>
> *I think the main drivers will be, how can I put it? Automation. People want to automate. People want to bring process improvement or a better way of doing things. PAT10*
>
> *We are always looking for more effective and efficient ways of doing things. So, in terms of looking for Improving effectiveness and efficiency. PAT11*
>
> *But secondly, and most importantly, is lack of efficiency. If I'm putting it in a way that you understand, when a process or a system is inefficient, one has got to now look at ways to optimise and use whatever's available out there to optimise the space and make it more efficient. PAT13*

4.4.2. Implementation of digital transformation in the public entity

4.4.2.1. Key role players & Critical processes

The key role players in the implementation of DT are shown in Figure F.1 in Appendix F, which contains the network diagrams underlying the analysis. Participants emphasised the role of leadership and their visibility in driving DT; however, these key role players were not all available and visible as in other BUs. Key role players perform some of the key and pivotal processes of digital implementation within PE, including the SCM and its governing processes and procedures, contract management, Investment and budget approvals and the role of BUs in setting the requirements. Although IT resonated as being the key role player to lead DT, these are the key

partnerships identified and participants felt a lack of integration in priorities and lack of shared KPIs and lack of joint accountability and measurement throughout all Bus for their contribution to DT as a strategic programme:

- **Information Technology (IT) Department –** Key systems solutions providers for PE, managing the sourcing, implementation and benefits realisation.
- **Supply Chain Management (SCM) Department** – Responsible for sourcing the systems and implementation partners.
- **Legal Department** – Responsible for compiling Service level agreements (SLA) with service providers.
- **Human Resource (HR) Department** – Managing people, change management and training.
- **Business Units (BU)**; Continuously seeking gaps where technology can be leveraged for process efficiency, cost effectiveness and risk and compliance mitigations using technology.

You, as an executive, set the pace, you set the tone, and you set the culture. And I believe that where we are today, digital transformation is definitely needed. PAT1

I think the first one I would highlight is the supply chain. When that runs right through the middle of any project in terms of the contracts that you have to put in place to implement a new solution. PAT6

4.4.3. Measuring capacity and implementation of digital transformation

4.4.3.1. Organisation capacity to implement digital transformation

Very few participants felt that PE had enough capacity to implement DT. For those who felt that they had capacity, the capacity was ongoing and exposure to certain projects gradually increased capacity as new skills was being learnt. However, the majority of the participants did not feel that PE had the capacity for DT due to mainly a lack of skills and limited resources; thus, these participants felt that there should be training, time dedicated to new projects, acquisition of new skills, availability of management and removal of bottleneck processes, see Figure F.2.

In varying degrees? Yes. There has been progression with regard to the implementation of digital transformation. And I'm also going to speak from, based on, the transformation initiatives I have been involved in or supporting, predominantly digital transformation or digital enhancements initiatives. PAT2

4.4.3.2. Organisation progress with digital transformation

The limited capacity to implement according to most participants, was resulting in slow progress, too slow for the required pace of technological developments. Tender cancellations, outdated technology, insufficient integration, lack of inhouse skills to support and lack of pilot roll out to full scale were mentioned as causes to fail implementation. Participants cited extensive and bureaucratic SCM processes as slowing development. In certain cases, systems take years to buy and eventually technology incompatible with existing old infrastructure, causing further delays and limited beneficiation. Employees and management were also divided between DT implementation and daily tasks. DT has both benefited and suffered from Covid-19. Remote working and collaboration technologies created progress, however, limited resources, time, and most importantly lost opportunities for on-the-job skills transfer from external partners to the internal IT on projects rolled out remotely. Participants believed that PE lacked KPIs to measure DT or the KPIs were rather high-level, not specific and not dedicated to progress on DT on all strategic, tactical or operational levels.

No, we don't have any new key performance indicators (KPIs) at the moment. PAT12.

I think there are, but they're limited. Let's look at the high level. The strategic one, you already have it. Some strategic KPIs linked to strategic pillars talk about transformation, whether the innovation hub in terms of technical information or a link to the supply chain. PAT6.

4.5. Challenges faced by the public entity during implementation of Digital Transformation

The second research question was what challenges does PE face during the implementation of Digital Transformation? Two themes answered this research question: workforce challenges and adaptability and Organisational IT competency (see Figure F.3)

4.5.1. Workforce Challenges and Customer Adaptability

4.5.1.1. Employee availability and engagement

According to participants, the general analysis on employee engagement was employees willing to participate; however, the availability of employees due to other work commitments and different priorities was low. Participants felt there was a lack of support for implementation skills. This was also exacerbated by employees being overloaded with work causing low energy and dampened innovations. The lack of availability further negatively impacted implementation milestones, such as delayed blueprint engagements and confirmations, user acceptance training and availability for training, all delaying project timelines. Participants highlighted challenges of not having the prerequisite skills to test systems thoroughly for a complete check of all possible scenarios and eventualities that can be encountered within new technology implementation.

> *Employees definitely get involved. Need champions for each area to sell the solution and encourage engagement. PAT14*
> *People are willing; they do get involved. However, challenges of conflicting priorities dampen the active involvement and negatively impact timelines as availability staggers out implementation. PAT2*

4.5.1.2. Digital competence management

Digital competence management was another workforce challenge. It was evident from the empirical data there was a challenge with digital competence, which included poor digital skills, with functions such as SCM not digitally inclined, and lack of technically savvy leadership, which makes it difficult for them to provide the necessary leadership

required for DT. Middle management's lack of digital skills and complacency also hindered the adoption and ownership of the DT strategy with some participants assuming its due to fear of loss of jobs and relevance. PE also does not have a targeted or preferred technology architectural landscape which can drive desirable competencies. This lack of internal capacity and technology preferences or direction also challenges capacity building to champion the recruitment and retention of relevant skills and the channelling of relevant training programmes required for DT.

4.5.1.3. Customer ability to adapt to digital transformation

The customer's ability to adapt to DT was important as this was central to the success of DT. Employees, adapting is one element for the internal customer, but the project cannot be successful if not implemented upstream and downstream into the value chain of the external customer. What came across was that the internal customers had the potential to adapt to technology changes with minimum resistance, particularly, the younger generation. Despite this, participants also highlighted some challenges with external customers' ability to adapt, understanding the technology and having the infrastructure for integration, such as integration into municipal systems and availability of user interphases for services to ordinary citizens. This mixed view highlighted the need for a focused, customised customer assessment of their ability to adapt to DT, and this can be done in a systematic approach and not have one *size fit* all for the customers.

4.5.2. Organisational IT competency in digital transformation

4.5.2.1. IT competency to implement transformation

The IT department in PE plays a pivotal role in DT; therefore, the need for IT to be well-resourced with equipment, skills, and finances in order to function properly and support other BUs. A lack of these resources meant that IT could not deliver on implementation objectives and could not fully support other BUs or lead the innovation processes. Mostly IT prefers to hire consultants to ease the burden of implementation and to obtain skills that are not housed internally. The IT departments did not deliver and required assistance from external service providers as well as the digital technology and information committee (DTI) to put in more effort in implementing solutions,capacitation or acquisition of new skills into PE for the newer up coming technology in the industry,

see Figure F.4. However, for some participants, the IT department was fully functional, although not optimally, they were able to support other stakeholders.

> *I think when it comes to competencies, PE is filled with a lot of intellectuals. There's high levels of competency when it comes to digital competence. But I do believe that we could do better in the IT space cause I don't believe it's leading, leading from the front, they are leading from behind. And they need to get ahead of this game. Cause ideally in a best case scenario, you want IT to be leading from the front.. PAT1*

4.5.2.2. IT Skill set and integration of IT processes in digital transformation

Some participants could not tell of the level of IT skill set within PE, and for those who could tell, they felt that IT did have some available skills; however, they did need support, additional new skills and training. They also felt that capacitating of new skills were slow, maybe because some were self-taught or taught over very short implemnetation periods when developers could transfer those skills. This also meant that the skills were specific to the organisational tools and that the confidence of the IT personnel in implementation would only grow gradually. A group of participants felt that there were no skills and that the skills available were insufficient to meet business needs, probably for the aforementioned reasons, such as limited resources and skills, especially for new technologies.

> *So as I indicated, there is, you know, the organisation has identified a lack of skill, you know, capability and capacity that is not sufficient to drive or meet our requirements, let alone to drive digital transformation too. PAT9*

PE had integrated processes that allowed for shared burden and increased availability of skills. According to participants, these integrated processes either did not occur across multiple business units, existed but needed to do better, or were good but needed to increase visibility. The reasons why these integrated processes were not rated as excellent by participants were due to a lack of understanding of technology by participants in these integrated processes and a lack of alignment in the processes. However, the additional concerns, such as only having integration occur through collaboration during the project cycle and operating in such a manner as if in different

areas and not as a cohesive team, meant that these integrated processes could not function at their optimum.

> *Yeah, hence the challenge, I think, for us now is a lack of partnership. As we mentioned, the innovation part does innovation to tick the box, you see, not to transform the organisation. PAT10*

4.5.2.3. Organisation capacity to scale up in the digital transformation

Business units could monitor transformation performance and value by piloting projects before expanding them. Compliance to SCM procedures has prevented pilot roll out to full development, making performance measurement difficult. Another problem was that piloting was frequently dependent on one department, such as the Innovation Hub and SCM, excluding other stakeholders such as IT meaning that the BUs might not properly measure performance nor scale up simultaneously once piloting is successful. The pilot is usually smaller than the main scaled-up implementation project and the stakeholders are different; therefore, performance statistics may be misleading when originating from the pilot. Finally, a lack of partnerships and sluggish implementation caused low availability, which prevented BUss from effectively measuring performance.

> *The chances are that because we have to comply with PFMA as we roll out, and also depending on the pilot contract that we have signed, I'm hoping that we are signing pilot contracts that end after the pilot and not tie us into the implementation of the bigger scale of projects we might then end up finding ourselves in the same problem that we've been facing of implementation. PAT15*

4.6. Changes required within the public entity to successfully implement Digital Transformation

The third research question addressed is what changes are required within PE to successfully implement Digital Transformation. Three themes answered this research question: Company changes required and implemented for DT, Managing

organisational changes for DT and outcomes that impact on the business units, see Figure F.5.

4.6.1. Company changes required and implemented for digital transformation

4.6.1.1. Changes in strategy

For most participants, if not all, a change in strategy was observed within PE towards achieving DT. Most participants were aware of the corporate strategy geared towards innovation to achieve compliance and address risks; this strategy drives DT. However, this strategy change has not translated into a change in processes and policies. However, some structural changes have been observed, for example, having the Digital Technology and Information Committee introduced to oversee all digital and innovation-related activities, supported by the creation and appointment of the CIO role at an executive level to strategies and operationalise the IT and OT functions. The innovation hub was established and other BUs, such as finance, have created PMO structures dedicated to driving DT.

> *Well, I know that we have a change to this new strategy, what is termed Innovation Risk-based strategy as this is the company's current strategy. They have identified the need for innovation within our organisation and hence amended the strategy accordingly. PAT11*

4.6.1.2. Change in internal processes

Although there are clear strides in changing the strategy towards DT, the cascading of responsibilities and changes in processes aligned with the strategy were lagging. Participants highlighted key processes and role players that create dependencies between each other for the success of the implementation of DT. However, there is no coordinated effort towards prioritisation, supporting each other, lack of SLAs and lack of accountabilities between the processes. Most BUs have identified a need for automation and streamlining of processes; however, the process to get this done is not streamlined, hence the pockets of excellence in some of the progress being made and not at an organisation-wide scale.

The finance BU, for example, changed its ways of working by creating an FPMO, where one of the pillars is DT. This structure enjoys the benefit of dedicated resources, time and measurement of progress in a concerted manner. In the establishment of the FPMO, however, a change in approach was required to deploy partnerships across SCM, IT, HR and legal; IT has come to the party, but SCM has not. Currently, each BU is at liberty to determine its priorities, which may not coincide with IT's priorities in driving DT or SCM to source the systems and partners needed for implementation.
The innovation hub in PE is also playing a critical role in testing applicability of new technology in PE such as Robotics Processing and Automation (RPA), however the lack of process alignment and prioritisation hinders a smooth transition to full scale.

It is important to note that despite the lack of prioritisation and integration, some benefits were derived from the covid-19 pandemic and changes in ways of working as PE quickly adapted to remote access and more collaborative working.

4.6.1.3. Changes in investments for digital transformation

It is without a doubt that DT requires investment; it is thus important that the way and approach to investment are changed and optimised to improve the success of a DT project. Participants highlighted that there is a need for a dedicated DT budget which will allow for effective implementation without hindrances.

> *Look, I mean, I think we still have, are not really investing sufficiently around digital transformation. You know, I'm not so sure about the quantum of the work in the innovation hub. PAT3*
>
> *In terms of investment levels, we've put quite a significant amount of investment towards digital transformation, that I would say, yeah, I think that it's quite a significant budget and especially this financial year, I think we have even increased their budget, to fund a number of these new initiatives that the organisation has identified but we have not spent. PAT5*

On the other side, when this investment is made available, planning and related competencies are required to ensure that the budget is used and the benefits are derived. This is because there was a consensus that significant budgets are made

available; however, its underutilisation, resulting from inefficient SCM processes, poor integration in project management, and a lack of integrated priorities.

4.6.2. Managing organisational changes for digital transformation

4.6.2.1. Measuring performance and maturity levels towards digital transformation

There were various issues regarding measuring performance, ranging from not having specific, measurable KPIs at a corporate level, lack of systems in place for measuring performance towards DT in any of the Bus, to having some form of measurement tool that did not properly cover the scope of the performance objective, which rendered it insufficient. Some KPIs are specified for certain BUs and only certain levels of management. In some cases, the KPIs of the IT department were at low levels and still needed to be expanded because their pivotal role in PE was linked to various business units' performance, and yet there are no shared KPIs for these integration points. Admittedly most participants felt that their measurement systems did need to be upgraded to measure the small progress being made towards DT, but importantly to measure the attainment of the implementation objective of DT better.

> *The public entity is embarking on an overall organisational Change Initiative, which can significantly increase the maturity levels in relation to change. This will be a process, though. It cannot happen overnight. PAT11*

4.6.2.2. Ensuring adaptation and embedded changes

Participants found that people were generally receptive to change management as they recognised the importance of remaining agile and adaptive to change in the digital era. Some of the reasons why this was possible were because BUs could clearly articulate the value of the service offering and personnel who could revive change champions who played a role in ensuring change, see Figure F.6. There is always hesitancy in some businesses units for change, primarily due to competing daily tasks, which could cause non-effective rollouts. There was also a note for general upskilling for participants, which could increase adaptation to change.

Engage the employees during the start of the project, and explain the plan; there will be few complaints; however, the culture is pro-change. Employees get excited at new plans. PAT14

4.6.3. Digital transformation outcome impact on the public entity

4.6.3.1. Changes/Impact on internal and external processes

The impact of DT on the internal and external processes for some of the BUs was negligible and did not show much impact; however, participants believed that internal systems would be impacted positively for some of the BUs. There was some impact as there was a positive progression within the implementation processes that would yield the desired impact and change, see Figure F.7. The impact of covid-19 also accelerated some of the internal and external processes of PE by favouring DT. The majorly affected processes were internal processes, as they were 70% affected versus 30% of the external processes. The main internal processes affected and enabled by DT were recruitment processes, remote access to information and collaboration within PE.

Increased efficiencies, reduced errors, reduced time to do work. Less time on manual papers and ensure uninterrupted supply. PAT14

4.6.3.2. Impact of channels of services and offering customers vs Intended benefits

The DT end goal is meant to change PE's profitability, and revenue collection, making things easier, transparent and more efficient for the organisation. It will reduce mistakes and give the organisation a competitive advantage. Participants said that the technology must be aimed at changing the customer experience from a service provision, access to information and convenience perspective. However, some BUs felt the money spent on DT had not yet yielded the required returns.

Maybe in terms of internal, it will impact a lot on internal business processes, Definitely. But as we advance, we may also see how it will impact the external business processes, especially with our customers. Imagine when we do automation, and after everything, information is available to everyone, then we just tell them, yeah, you guys owe us, Then it keeps on popping on their side

every single day. They're going to be annoyed and possibly pay us on time. PAT10

4.7. Strategies that can be adopted within the public entity to successfully implement Digital Transformation

The fourth research question was about what strategies can be adopted within PE to successfully implement Digital Transformation. Although the analysis confirms that all aspects of Bunman & Peter (2019) Cross-industry DT Framework need to be worked on, the results highlight four key strategies, see Figure F.8; 1) Establishing key external partnerships, 2) strategies around the sourcing of external partnerships through SCM, 3) incentivising active employee engagement and 4) strengthening the IT competency as a strategic lead and driver of DT.

4.7.1. Establishing key partnerships

The strategies used mostly by PE in implementing DT were external partnerships. However, as mentioned by most IT participants, PE only sources external partnerships when the requirements are unmet from internally available skills. Partnerships are also sought from an academic, research, consultative and benchmarking perspective from reputable IT knowledge hubs. The company's needs for DT highly shaped the external partnerships, and thus this was the main critical strategy for establishing partnerships.

4.7.2. Sourcing external partnerships for digital organisational transformation

Some participants agreed with the external partnership strategy and highlighted that the optimum model should include a hybrid approach that includes external and internal synergies, even proposing a 70:30 for internal to external.

I don’t know; there’s a best practice—a lot. A few years ago, Gartner said that most companies go for a 70-30 split, where they must be able to do 70% of the work internally, and they’ll supplement it with 30% of resources and skills from outside. PAT6

This was important to ensure no overdependency on the external providers, only sourcing for what is not internally available. This is important to increase the internal competency and sustainability of the DT. This is however not yet the case with PE due to a lack of technology skills such as developers internally, however knowledge transfers from external partnerships in current implementations is taking shape.

Most participants, raised the challenges faced with sourcing external partners, which was regulated, time-consuming and bureaucratic. Sourcing of partnerships was also externally led by what markets perceived is the requirement and not internally led by IT pre-determined strategies. External sourcing must include software, infrastructure and support contract and these should be minimum criteria for a holistic implementation, not split apart. Other partners had no interest in PEs DT strategy and ambitions, and resulted in sluggish and weak quality implementation.

> *but I know there's a number of bids that have gone out in an effort to improve our infrastructure as it is outdated. Take the time of bureaucracy of signing off things, so perpetually being behind. By the time implementation, the technology is three years behind. There are alignment and integration issues in the approaches. PAT13*

4.7.3. Incentivising active internal engagements of employees and Change Management

Another strategy for ensuring internal participation and success in DT is incentivising the employees for excellent participation and engagement in DT projects. This was not the case for many BUs represented by the participants. As a result, for some, the reward systems were either unclear or non-existent. There were mainly general awards for the whole public entity, and none dedicated to DT programmes. Recognition of participation would require measurement processes to be implemented to identify exceptional performance.

> *We do have incentives, but that was blanket just for the organisation to reach its target on stuff like that. So, it's not individualised. It's not to say that I performed well on this project. PAT4*

4.7.4. Strengthening IT competencies to lead Digital Transformation

IT played a pivotal role in DT to the point where other departments relies on it for DT. On the one hand IT participants felt that the business units must be available to partner and drive implementation together with IT, leading with requirements and efficiency-seeking processes, availability and prioritisation of the project by employees for engagements, testing and approvals. On the other hand, participants from business units relied on IT. They felt that they needed IT to be more knowledgeable, be at the forefront of introducing new technology and have the skills to improve and support the business on effective implementations and seamless transitions and support to new technologies. Other participants highlighted their desire for IT to take on the lead on research, market scans, feedback from conferences introducing latest trends and being implemented.

Participants also discussed the outdated technology and lack of integrated systems which needed to be established. A more structured and targeted approach to the kind of technology PE has an appetite to charter towards as a defined framework, having considered the future direction and continuously evolving road maps around ERP, architecture and infrastructure for PE. This targeted approach would channel strategies around skills acquisition and capacity-building programmes driven by the requirements of these specific technologies.

4.8. Chapter Conclusion

This chapter began with a review of the relevance of participants and the empirical data collected. This first step contributes to the credibility and rigour of findings. A total of 243 codes were generated from 15 transcripts. Nine themes and 24 sub-themes were explored in line with the four research questions, where relevant/indicative excerpts from the transcripts were used to support the analysis findings. The next chapter will outline the discussion of the study results.

CHAPTER 5: DISCUSSION OF RESULTS

5.1. Introduction

The analysis and findings in Chapter 4 are discussed in detail, and conclusions are made based on the responses' significance. The discussion unpacks the process PE undertakes to implement DT and the challenges and successes observed. These findings are compared to the literature review undertaken, and recommendations of changes and frameworks required are made for future implementation of DT by public entities.

5.2. Implementation of Digital Transformation by the public entity

Bunman & Peter (2019) provides a cross-industry DT Framework which sets as an anchor for the discussion of the multi-faceted phenomina of DT implementation in a public sector. This allows for thorough assessment of DT maturity and recognition of continuous progress being made towards DT.

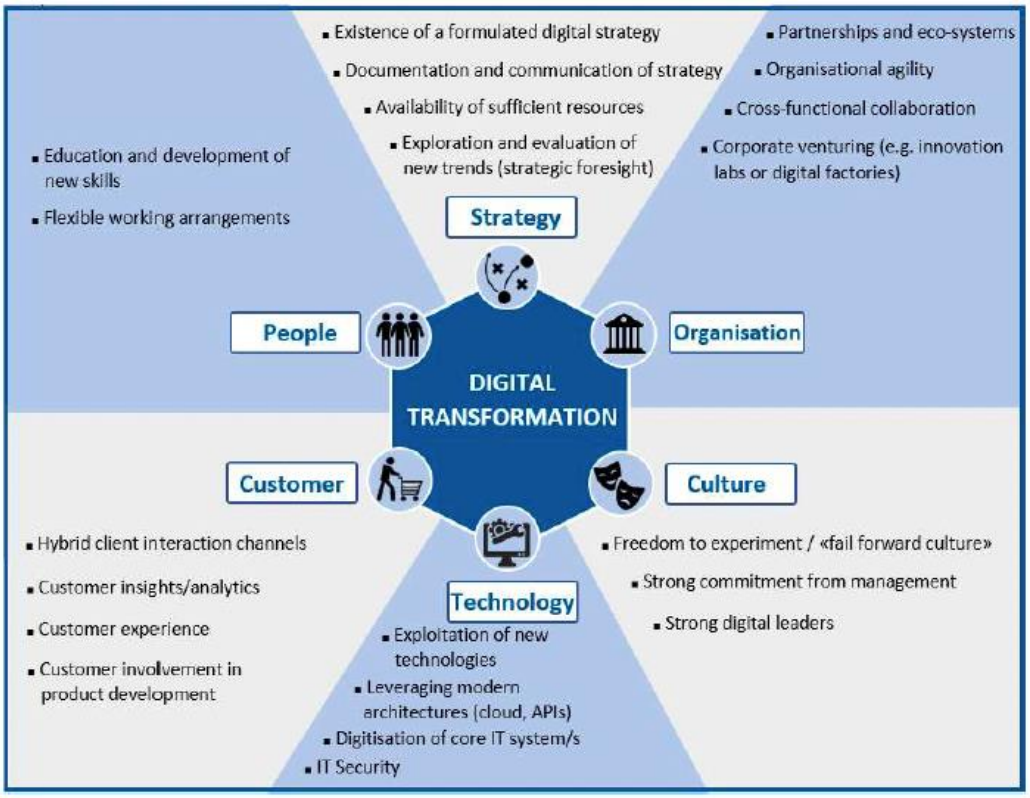


Figure 5.1: Digital Transformation Framework with sub-dimensions

Source: Bumann & Peter, 2019:31.

5.2.1. Digital disruption of industries and company's digital transformation

The data analysis shows that management of PE is aware and acknowledges digital disruptions within the industry; however, it came out strongly that more can be done. It is evident that PE has a strategy in place, and all intentions are aimed at innovation and to digitally transform. Despite differing opinions on where to position the strategy, literature underlines the importance of digital strategy (Brown & Brown, 2019). According to various digital transformation models, effective public entities' digital strategies must be thoroughly documented, disseminated, and internalised by all employees (Benjamin & Potts, 2018; Schneider & Kokshagina, 2021). The approach should be updated and tested, and appropriate resources must be available (Bumann & Peter, 2019). This, however, is seen only in small pockets of excellence at PE, indicating that the approach and progress are, therefore not universally prioritised and replicated in all BUs. PE also recognises it's need for DT primarily driven by key drivers: process improvements, building efficiencies and being cost-effective. Secondary drivers are customer and user needs, risk identification and mitigation, and the use of technology for addressing compliance matters, as PE defines it; "Innovation Driven Risk Based Strategy".

5.2.2. Implementation of digital transformation in the public entity

Leadership, IT, business unit owners and SCM are identified as the key role players in charge of processes that are integral to ensuring that PE can deliver on its DT programme. Kraus et al. (2022) confirmed that PE's attitude to new digital technologies is an important part of the digital transformation strategy. The technological dimension of DT emphasises that PE's adoption of new tech must be collaborative and fluid and incorporate iterative approaches to technology development using modern architectures like the cloud and APIs to enhance flexibility and speed (Reis et al., 2018). Unfortunately, the participants reported that critical processes involved in implementation were not streamlined or integrated. Therefore priorities were not aligned, and no processes existed to enforce alignment, prioritisation and debottlenecking. Participants reported that it was then left to the discretion of middle management whether to prioritise and assist the IT department with its DT Programmes, e.g SCM to prioritise the award of service providers. Also, there was a lack of measures to hold support process owners accountable in case of delays and

lack of support from inter-dependencies. Gangneux and Joss (2022) and Press et al. (2021) emphasise flexibility to change priorities and teams when implementing DT. Legacy IT systems, frequently at the core of the IT infrastructure, limit innovation and agility in many public entities (Agostino et al., 2021; Johansson, 2022).

5.2.3. Measuring capacity and implementation of digital transformation

Most participants explained why they thought PE could not implement DT. Common challenges supporting this observation were;

- a lack of strategy adoption and prioritisation by senior management,
- slow, cumbersome and rigid SCM process,
- lack of integrated priority and approach,
- lack of integrated systems based on a defined architectural landscape,
- lack of latest IT skills,
- lack of project management skills,
- lack of dedicated resources engagement and time,
- lack of incentives and rewards for the workforce, and
- lack of customer impact amongst many others.

With this list not being exhaustive, PE does not have a measurement system to critically evaluate and rank the challenges to measure them progressively as the hurdles are resolved. Literature underlines that corporate rules that support DT must be developed to make strategy practicable (Schneider & Kokshagina, 2021) and that successful DT adoption is couched in consultation with employees and customers (Kraus et al., 2021; Jonathan, 2020). Leaders must persuade company employees to accept DT (Norling et al., 2022; Zuiderwijk et al., 2021), and IT department must lead, support and communicate during DT changes (Papavasiliou, 2020; Syed et al., 2022). A dedicated team for implementation and R&D for DT systems was also suggested (Goh & Arenas, 2020; Nadkarni & Prügl, 2021), which PE houses its pilots within the Innovation department.

5.3. Challenges faced by the public entity during the implementation of Digital Transformation

5.3.1. Workforce Challenges and Customer Adaptability

Motivated employees that are knowledgeable of their processes are required to be released from daily activities of their Bus and to participate in implementation of DT together with IT (Brown & Brown, 2019; Sichaanji, 2022). Although participants reported willingness to participate in partnership with IT, this cannot be with competing interests and without support and recognition. Incentives can resolve soft issues of motivation and low energy that dampen adoption and innovation; however, IT skills, project management, and implementation skills need dedicated attention (Kitsios & Kamariotou, 2021; Shreya, 2022). A more threatening bottleneck in translating strategy to implementation may be the lack of renewed mindsets of middle management as suggested by Zuiderwijk et al., (2021). This may answer to lack of ownersghip and cascading of strategy as the transition required of middle management from directing and controlling stable processes and people to a digital era, may render them redundant or incapable due to lack of digital skills (Modiba, 2020). The fear and anxiety of loss of jobs has been suggested to be the cause of resistance to change and years of delayed implementation. A heightened change management approach at specific areas, enabling environment for managers to explore without a whipping stick on failures, but with timelines and follow-through is necessary.
Collectively these mitigate challenges of delayed timelines in project implementation. A digitally inclined workforce from leadership, management and overall staff is key for successful implementation (Brown & Brown, 2019; Sichaanji, 2022).

The data collected suggest that PE needs to invest in internal capacity for digital management skills, including project management. Prioritisation of digital systems for key processes such as SCM are key and having a tech-savvy leadership to run a dedicated DT strategy for PE is necessary (Danielsen et al., 2022; Tsolkanakis, 2022). A systematic approach to customers' ability to adapt to new technological advancements is required for both employees and customers, with specific attention to the needs of the user base, the customer's digital inclination and technological infrastructure (Ahn & Chen, 2022). Access to the platforms where the digitisation is taking place is also key, e.g., a full procure-to-pay process in a public sector will need

to consider the access to technology platforms for bidders to submit documents as well as the training and infrustructure required for municipalities and user customers to receive real-time data at their figure tips. This is key as the userbase and customers are more likely to embrace digital technology that eases their work (Cichosz et al., 2020; Gomez-Trujillo & Gonzalez-Perez, 2021).

5.3.2. Organisational IT and customer adaptability to digital transformation

The participants reported that PE relies on the IT department to lead in digital technology, competencies and skill set. Therefore, for a successful DT implementation, PE needs to capacitate this department with the right skills, management and technology (Davenport & Westerman, 2018; Meyerhoff Nielsen, 2019). At a strategic level, participants are aware of the employment of a new Chief Information Officer to drive the IT and OT strategy. They are mostly hopeful that anticipated changes towards DT will become visible. Governance through the DTI framework provides structure, support, and funding approval processes. The reported lack of skills, technology and project management at senior and middle levels is an area of concern. It has led to an inability to deliver on implementation objectives meaning IT could not support other departments or lead the DT programs. Adaptive leaders who embrace DT tend to win over staff (Kraus et al., 2022).

Participants say that implementation and the support of DT are currently highly dependent on hiring external consultants and developers, and knowledge transfer processes will take time to embed the newly acquired skills by internal IT. This suggests that more effort is required on a cohesive approach to DT, with a concerted effort towards upskilling on specific predetermined technologies e.g SAP, Oracle, BW within PE's deliberate choice of DT strategy (Danielsen et al., 2022; Tsolkanakis, 2022). Literature suggests the creation of a platform for shared skills and facilitating integrated processes across all value chains, including the innovation department, to ensure that upscaling can be seamless through the DTI, which is also a strategic vehicle of new DT (Benjamin & Potts, 2018; Schneider & Kokshagina, 2021). Opportunity exists for shared skills at a National level across multiple public entities.

5.4. Changes required within the public entity to successfully implement Digital Transformation

5.4.1. Changes required and implemented for digital transformation

Strategic changes have been observed in PE through a documented strategy, namely “innovation-driven, risk-based strategy”, the recently established DTI Committee and the recent employment of the Chief Information Officer; however, participants reported that these are yet to be seen if they will enable effective implementation of DT programmes. It is, therefore, not enough to document strategies and change structures; proper alignment and cascading of the strategy, deliberate follow-through and measurement of progress are required to ensure that strategy translates into tangible, effective implementation and ultimately improve efficiencies in business processes through digitalisation, such as improving the SCM processes through automation (Bumann & Peter, 2019).

Although Covid has provided a leap into collaborative ways of working, integration across the key processes that are impacting implementation of DT has to be driven from a strategic perspective, but more so, operational changes in the current ways of operating in silos are required for a concerted effort and goal congruency across PE with elevated prioritisation of DT programmes. This cannot be left to chance, and prioritisation cannot be at the discretion of management; it has to be driven from the top and enforced through the measurement of KPIs and accountability (Agostino et al., 2021; Johansson, 2022).

PE seems to make funds available for DT sufficiently, however changes are required around planning and project management competencies to ensure spending. Changes are required in the approval of investment approach; optimising the governance structures, enabling policies, and reduced bureaucracy in approval processes (Benjamin & Potts, 2018; Schneider & Kokshagina, 2021). These changes must cut across the entire value chain and structures, from sourcing of external service providers within SCM, process owners, and a balance of synergies between external and internal role players with clear lines of accountability for effective implementation (Cem et al., 2021; Hai et al., 2021). A change in IT & OT processes is emphasised, these being the custodians and main drivers to lead DT with robust technological

forward-looking strategies, thought leadership and clear road maps to drive and lead from the front and not merely tag along behind the requirements of business units (Bumann & Peter, 2019).

5.4.2. Managing organisational changes for digital transformation

Participants emphasised that progress towards DT needs to be measured. What gets measured gets done. Concerted efforts and prioritisation must be driven from the top and cascaded into measurable objectives and KPIs to senior management and middle management (Norling et al., 2022; Zuiderwijk et al., 2021). Without streamlining priorities, every BU seems to be pulling in different directions and without measuring KPIs, managers 'get away' with years of recurring delays and unresolved issues. BUs and managers must be able to hold each other accountable for providing integrated support towards each other on DT programmes (Benjamin & Potts, 2018). From participants, IT must be supported in leading the DT Programmes with an aligned SCM process and Training and Change Management through dedicated Business Partners working together in cross-functional Programme Management Offices (PMOs). Further, PMOs that are in place must monitor and measure progress independently and report to the structures that have been created (such as the DTI) for accountability and to ensure there are consequences for non-performance across dependencies.

Due to previous non-effective rollouts, employees may be hesitant to adopt or participate in new initiatives; therefore, strengthening the change management functionality will be crucial to increase adaptability by employees and users of new technology (Sichaanji, 2022). PE may benefit from change champions who must play an active role within the cross-functional PMOs but, more importantly, effect tangible activities on the ground that will ease employees into adoption (Kraus et al., 2022).

5.4.3. Digital transformation outcome impact on the public entity

Online recruitments, remote working and collaboration were key positive gains highlighted from the covid-19 pandemic regarding progress in DT for PE. Besides these, were minimal outcomes that have impacted PE thus far. This seems to be despite the good strategies, good intentions and a great end-state picture as envisaged

by the executives; to positively impact PE with increased revenue streams, efficient processes and cost-effective methods and a great user experience outcome that will translate to an increased triple bottom line. During the DT, the customer and end user's experience needs to be top in mind, focused on ease of use and access to information at the figure tips (Nwozor et al., 2022; Sutcliff et al., 2019).

5.5. Chapter Summary

In tandem with the introduction of digital technology, digital transformation necessitates organisation-wide transformation, as confirmed by Gong and Ribiere (2021:2), "Transformation in the context of the DT refers to a fundamental change of a whole new form, function, or structure with the adoption of digital technologies that create new value." This need has been elevated by the covid19 global pandemic, seeing PE having to adapt to the working-from-home operating model. This change exacerbated the need for technological advancements, the interconnectivity of data, systems, and real-time automation of processes for efficient processing, analysing, and reporting of financial data.

Participants report that PE is falling short of its DT ambitions as the adopted digital strategy is hamstrung by numerous factors linked to the ineffective translation of strategy into implementation. Additionally, a non-cohesive, non-measurable approach across un-integrated processes, including SCM, leads to slow progress if any. Change management processes are not well-conceived and not visible with tangible impacts on the ground, competing tasks and lack of reward and recognition has led to blockages and bottlenecks left to managers and practitioners to negotiate. The next chapter concludes the study and summarises the recommendations

CHAPTER 6: CONCLUSION

6.1. Introduction

Digitalisation efforts are crucial for public entities to become more effective and efficient in their procedures and outputs. Although public entities must adapt to the digital world, less is known about how they define and approach DT in their daily operations, the implementation process and the anticipated outcomes. DT must be a key strategy for most organisations to compete and survive. This study confirmed the premise that Information technology (IT) alone does not promote change; processes, people, policies, and leadership must be substantially altered to achieve DT in the public sector.

This chapter concludes and makes final recommendations based on the analysis made in Chapter 4 and the discussion in Chapter 5. Limitations of the research are also explained, providing a direction for future studies for fellow researchers.

6.2. Conclusion

PEs strategic direction is cemented in the Innovation Driven Risk Based strategy and good progress has been made in the recently appointed CIO, functioning of the Innovation hub and establishment of DTI committee. However, PE appears to be missing the mark of its DT aspirations because the adopted digital strategy is being hampered by several factors associated with insufficient organisational agility to translate strategy into practice and create enabling cross-functional collaborative implementation environments. In addition, the procedures involved in change management seem poorly conceived, resulting in systemic obstructions and bottlenecks that individual managers and practitioners must overcome. Though there seems to be enough funding available, the cumbersome acquisition and development of new skills – both digital and managerial – seems to lag the financial commitments made. Partnerships, ecosystems, agility and ability to adapt fast to technological or market developments is more crucial now for PE to make headway towards transforming beyond strategy documentation.

Holistically, findings from the study dwelved into each of the 6 sub-dimensions from the cross-industry DT Framework provided by Bumann and Peter (2019) and is recommended for adoption as a DT framework for public entities, for assessing readiness and maturity in aspects of; embedding of strategy, organisational structures and performance management, culture, processes, new technology, skills development and change managemnent of people and customer outcomes and experience. Embedding of strategy should include extensive review on sourcing of partnerships (SCM) as a specific phenomena in the public sector. The framework has proven to be useful as a continuous assessment tool for entities to progressively measure and benchmark themselves as they make strides towards digitally transforming. This can also be revisited at any point of the DT journey as the framework describes a structured approach for progressive improvements in each aspect assisting in beter future implementation outcomes. Small gains towards this are to be celebrated.

6.3. Recommendations

A plethora of systematic interventions is required to make the leap from ‘doing digital’ to ‘being digital’. The recommendations outlined below are those championed by the participants, summarised in Table 6.1 while a more comprehensive list of best practices from the literature is included in Table G.1 in Appendix G. PE is advised to adopt a progressive approach based on current levels of digital readiness and maturity.

Public entities have to make organisational changes that promote flatter, leaner structures that empower workers and enable speedier decision-making. A digital transformation PMO with cross-functional teams of developers, IT experts, designers, and product owners must use agile sprints and design thinking to create, test, improve, and integrate the digital intervention into the business with measurable objectives put in place. Organisations undertaking DT must set SMART (specific, measurable, attainable, realistic and time-bound) objectives and, most importantly, measure the progress of this particular public entity’s DT Programme in all 6 aspects of the cross-industry DT Framework, Bumann and Peter (2019). Deliberate and dedicated means of incentives and reward systems are required to recognise employees who have participated or been seconded into DT programmes to get full engagement from relevant employees amidst their day to day work or through full time secondment.

Active and flexible internal partnerships are required, especially between IT, and business units. Although IT requires BUs to own up to the transformation in their area, continuously identify gaps and process improvements, the thought leadership has to be driven and engineered by IT to deliver on the relevant technological advancements, skills and knowledge.

Although the IT department is tasked with leading DT implementation, it has become clear that an integrated approach to all supporting processes is required. This can be achieved through cross-functional teams that must be constituted and driven cohesively. These teams must have representation from all required support processes and be managed through a dedicated PMO for DT. IT, SCM, requisite business units, Finance, Training and Capacity Building, are key support processes to unbottle implementation challenges. PE has to drive a deliberate technology landscape informed by its future aspirations and operational demands around architecture, software and infrastructure through strenghthened partnerships with OEMs and not merely persuaded by the supply market. This approach of a pre-determined landscape sets the direction for what is to be sourced and also guides capacity building on which programmes to undertake in support of DT; what skills to recruit, retain and develop.

DT also requires a forward-thinking corporate culture that lets employees pursue ideas in a multidisciplinary and decentralised approach. Digitally developing organisations have cultures that emphasise rapid experimentation, risk-taking, talent investment and leadership's soft qualities over technical skills. However, such a culture requires a strong and ongoing commitment from the board and executives to support the digital strategy. Thus, successful digital transformation requires strong digital leaders who are not necessarily high-tech wizards but can manage complexity, inspire and develop distinct digital cultures conducive to success, and promote the development of innovative digital solutions despite investment risks. Middle managers have to develop these new skills and overcome the fear of losing their relevance, only if the environment enables this and this may involve an environment that allows managers to explore, fail and try again.

Establishing and sourcing external partnerships for implementation of DT was a key strategy for PE. The public sector must find avenues to fast-track the SCM processes

within the ambits and acceptable governance norms and standards to improve responsiveness to the speed of technological advancements. Recommendations from participants includes SCM policy amendments to enable strategic sourcing only through original equipment manufacturers (OEM) appointed following a normal tender process with the requirement for OEMs to subcontract to their own preferred suppliers (consultants); Contracts should include infrastructure, and at least 3 years of support seamless with at the conclusion of implementation. More critically, these external partners should be competent with advanced implementation experience to transfer the knowledge internally. National Treasury engagements on acceptable deviation processes specifically addressing the bottlenecks in sourcing for DT implementations has to be explored. These have to be responsive to lengthy procurement delays, which, as reported by participants, can take years. More importantly this ensures quality implementation, accountability of OEM, on-going support, knowledge transfer and alignment to future advancements planned by OEMs.

Partnerships for knowledge sharing and benchmarking on technological advancements will become critical, where OEMs and technology experts can guide, advise and break new ground on proof of concepts addressing public service digitisation.

When it comes to people aspects; human skills and digital technology experiences in addition to various technological resources needs review. A growing skills gap between the workforce and VUCA (volatile, uncertain, complex, and ambiguous) conditions is noted in literature, therefore, organisations must establish and implement appropriate training programmes and educate, train, and develop digital and new management skills to improve employee employability, technology adoption and personal development. Investments in capacitating and strategies around relevant and continuous skills development on IT skills set (both technology and project management) need to be fast-tracked and implemented swiftly. Improvements and robust expectations on knowledge transfer by service providers during project implementation for new technologies within PE need to be clear, transparent and traceable (both functional and technical). This will determine adaptability amongst employees, whilst IT skills set is strengthened to provide in-house support.

6.3.1 Summary Recommendations

Table 6.1: Best practice recommendations for DT

Study Recommendations	
CULTURE	Create measurable, tangible targets for senior and junior management with accountability and lucrative rewards and recognition opportunities. Manage deliverables and not people and hold people accountable for lack of performance through direct engagements. Assess also the nature and requirement of the type of work. (Kraus et al., 2022)
	Establish and Standardise Change Management approaches and ensure ON THE GROUND impact is seen, felt and tangible, not only on paper. Formalise Knowledge Transfer procedures during implementation to build up the internal capacity to support employees. (Danielsen et al., 2022; Tsolkanakis, 2022)
	It is imperative that all business leaders and managers (especially middle managers) be assessed for digital capability and literacy to mitigate the fear of innovation and resistance to change (Aidanpää & Sjöberg, 2021; Paavola, 2020).
CUSTOMER	The importance of developing user-friendly digital systems in relation to end-user/customer take-up cannot be overstated (Nwozor et al., 2022; Sutcliff et al., 2019).
	Maintaining open channels of communication between IT and business units will go a long way to mitigate risk and change aversion (Papavasiliou, 2020; Syed et al., 2022)
ORGANISATION	Appoint and reward skills at the right level. Incentivise employees and create secondment opportunities that can release employees from normal day-to-day and pay dedicated attention to DT. (Davenport & Westerman, 2018; Meyerhoff Nielsen, 2019)
	Source an external strategic partner within the ambits of public regulations with multiple skills and digital competencies to implement DT, transfer skills and provide extended support to ensure sustainability and independence of internal teams. (Cem et al., 2021; Hai et al., 2021)
	Establish clear policies and road map based on where the organisation wants to invest, e.g., driven by ERP future preference, available infrastructure and cyber-crime mitigation capabilities. Data, infrastructure and architecture alignment and roadmap will pre-determine which technological skills to invest in and develop in-house rather than a reactive approach as a result of unknown procurement outcomes. (Benjamin & Potts, 2018; Kraus et al., 2021; Jonathan, 2020; Schneider & Kokshagina, 2021)
	Expand on PMO establishment to cater for corporate-wide DT with cross-functional representation. DT programmes must be prioritised alongside the prioritisation of infrastructure. (Agostino et al., 2021; Johansson, 2022)
	Implement corporate-wide performance monitoring systems that cater for cross-functional dependencies in Programme Management (Norling et al., 2022; Zuiderwijk et al., 2021).
	Formalise IT partnerships with business units (Papavasiliou, 2020; Syed et al., 2022).

Study Recommendations	
PEOPLE	Focussed investment in the IT department to obtain the new digital skills and capabilities required to realise DT (Gong & Ribiere, 2021; Manda & Backhouse, 2017).
	Focused strategies on upskilling current and bringing in new digital competencies (Brown & Brown, 2019; Sichaanji, 2022).
	Employee boot camps, hackathons, huge online courses, and rotation opportunities can be added to the normal suite of training programmes. Leaders can collaborate with universities, incubators, and other organisations to access crucial talent.
	Future workplaces should be pleasant and adaptable. Home offices, mobile working, desk sharing, and digital workspaces motivate employees, reduce infrastructure costs, and attract digital-savvy employees. (Bumann & Peter, 2019)
STRATEGY	Strategically create a pool of specific specialised skills based on the selected strategy/direction of the organisation, e.g., SAP and Oracle intensive skills that can be shared and create longer support contracts to ensure beneficiation and knowledge transfer to internal staff (Gangneux & Joss, 2022; Press et al., 2021).
	Executives to cascade strategy into actionable implementation roadmap. Elevate DT as a strategic programme, creating enabling policies and integrated processes, including an agile SCM. (Kitsios & Kamariotou, 2021; Shreya, 2022)
	Nurture an environment of the sensory business capability to remain abreast of technological developments, e.g., participate in seminars and conferences concerning DT (Manda & Backhouse, 2017; Zachari, 2022). Consult businesses which have effectively adopted DT for guidance (Kraus et al., 2021; Jonathan, 2020).
TECHNOLOGY	Robust post-implementation audits to ensure beneficiation, continuous improvements and support. Focus on user experience and continuously seek ways to improve the adaptability of employees and customers at large. Implement digitisation that drives efficiencies and cost-effectiveness, Real-time information, predictive analytics, and Robotics processing. (Goh & Arenas, 2020; Hai et al., 2021)
	Assess the gains that can be made by technological advancements, and leverage cost savings from remote working. Establish a Hybrid policy and test functionality to assess behavioural issues and accountability aspects. (Cichosz et al., 2020; Gomez-Trujillo & Gonzalez-Perez, 2021)
	Cybersecurity must be at the heart of the development of e-systems or the exploitation of new technologies (Mergel et al., 2019; Mu et al., 2022).
	Care must be exercised in developing digital solutions that are interoperable with other digital systems. Also, while experimenting, maintain two parallel systems so as to not compromise service delivery. (Agostino et al., 2021; Ahn & Chen, 2022; Reis et al., 2018)

6.4. Study Limitations

Qualitative research's subjective approach introduces researcher and participant bias (Saunders et al., 2019), which may affect data and interpretation. The absence of researchers' independence from the data gathering process, the data's reliability, and the researcher's interviewing abilities (without prior training in conducting research) can affect data quality (Shenton, 2004; Tracy, 2010).

This study was cross-sectional, so the data collected is a snapshot in time. This means the data is vulnerable to what was happening in PE during data collection, e.g., results may be different if it was before or after performance appraisals. Also, a different (still relevant) participant pool may have answered study questions differently.

The ability to generalise the outcomes of this study may be limited as the experiences of this public entity may not represent the experiences of another public entity (Simon & Goes, 2013). According to Mergel (2019) the perceptions, usage and the role of technology and what individuals in the organisations make of it, is constrained by and is dependent on institutional arrangements, which differs from organisation to organisation (Mergel et al., 2019)

The limitation of this study is that it is geographically bound as it analysed only one public entity in South Africa. The assumption can be made that other public entities may find themselves within similar circumstances regarding the regulatory environment, processes and competencies around DT or not. The study was also limited by time and cost as the study needed to be completed in a predetermined period and within the researcher’s available resources.

6.5. Areas for Future Study

It is recommended that fellow researchers contribute to validating the cross-industry DT framework used in this study, especially from a public sector stance to test this study's methodology and also to test its findings against other public entities. Another alternative would be to zoom in on one of the DT framework's dimensions for a more detailed look into the culture, customer, organisation, people, strategy or technology effects on DT implementation.

Future studies can also consider a holistic review of SCM processes that will enable fast paced DT within public space, at a regulatory and national level that can enable faster-paced sourcing of systems and implementation partners for public entities to implement robust technology that is fit for purpose. The Inherent nature of DT is speed of technological advancements, therefore speed of SCM processes where external competencies are sought will determine success of public entities in DT. This review can consider agile processes for implementing DT programmes that will enable public entities to move swiftly and not merely play catch up. Shared quality reviews of implementations and open comparatives of best technologies, shared resources and skills set across public entities is an opportunity worth exploring.

Both public service and DT should ultimately result in real benefits to citizens' lives. If public and commercial sectors are committed to this concept in good faith, there is no limit to public service development and constant improvement. This is also an area for further studies to measure real outcomes and social improvements coming from Digital Transformation in public entities.

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LIST OF APPENDICES

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Appendix B – Informed Consent

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Appendix A – Participant Information Letter



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PARTICIPANT INFORMATION SHEET

Dear Sir / Madam,

My name is Star Mokhabela, I am a Master of Business Administration student at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project. I am investigating **Implementation of Digital Transformation in a Public Entity** under the supervision of Ayanda Magida. The purpose of the research is to obtain in depth understanding of the implementation processes, successes and challenges that the public entity experiences in implementation of the Digital Transformation Programme for the finance department within the public entity and propose alternative ways that will aid better implementations in the future and for other public entities.

Due to your role in part of or wholly in the implementation of digital transformation programme, I have purposefully sampled you and would like you to participate in the interviews. To obtain meaningful results, your knowledge and experience are of particular great importance in helping us identify and deeply understand your perception of the implementation process and what improvement processes should look like specifically in the context of a public entity.

The duration of the interviews will be a minimum of 30 minutes to 1 hour maximum. I would also like to audio record the interview on Teams with your permission. This recording will be stored in a secured Onedrive folder, and only I will access this recording.

Participating in this research project will not incur any personal costs. You will not receive any direct benefits from participation, and there are no disadvantages or penalties if you do not choose to participate in the study. You may cancel at any time or not answer any questions if you do not want to. You also have the choice to withdraw from the study at any time. The interview will be confidential and anonymous and the information you give me will be held securely and not disclosed to anyone. I will use a pseudonym (false name) to represent your participation in my final research report.

Kindly note the following:

1. You need to give consent for us to include you in the study.
2. All personal questions and identity will be protected
3. The interview will be dealt with confidentially.
4. The original interview will be stored in the Wits library.
5. The interview will be recorded and transcribed.
6. The research process will be conducted in such a manner that the safety of the participants comes first. Thus, appropriate measures that would ensure that the research poses no harm to research participants will be taken.

If you have any questions about this research, please don't hesitate to contact me at the details listed below. This study will be written as a research report and published online through the university library website.

Thank you for taking time to participate in this study

Yours sincerely,
Star Mokhabela

Researcher: Star Mokhabela
Email: star.mokhabela@gmail.com

Supervisor: Ayanda Magida
Email: Ayanda.magida@wits.ac.za

Appendix B – Informed Consent form



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CONSENT FORM

Research title: IMPLEMENTATION OF DIGITAL TRANSFORMATION IN A PUBLIC ENTITY

Name of researcher: Star Mokhabela

I, ……....., agree to participate in this research project. The research has been explained to me, and I understand what my participation will involve. I agree to the following:

I agree that my participation will remain anonymous.

I agree that the researcher may use anonymous quotes or false names in his research report.

I agree that the interview may be audio recorded.

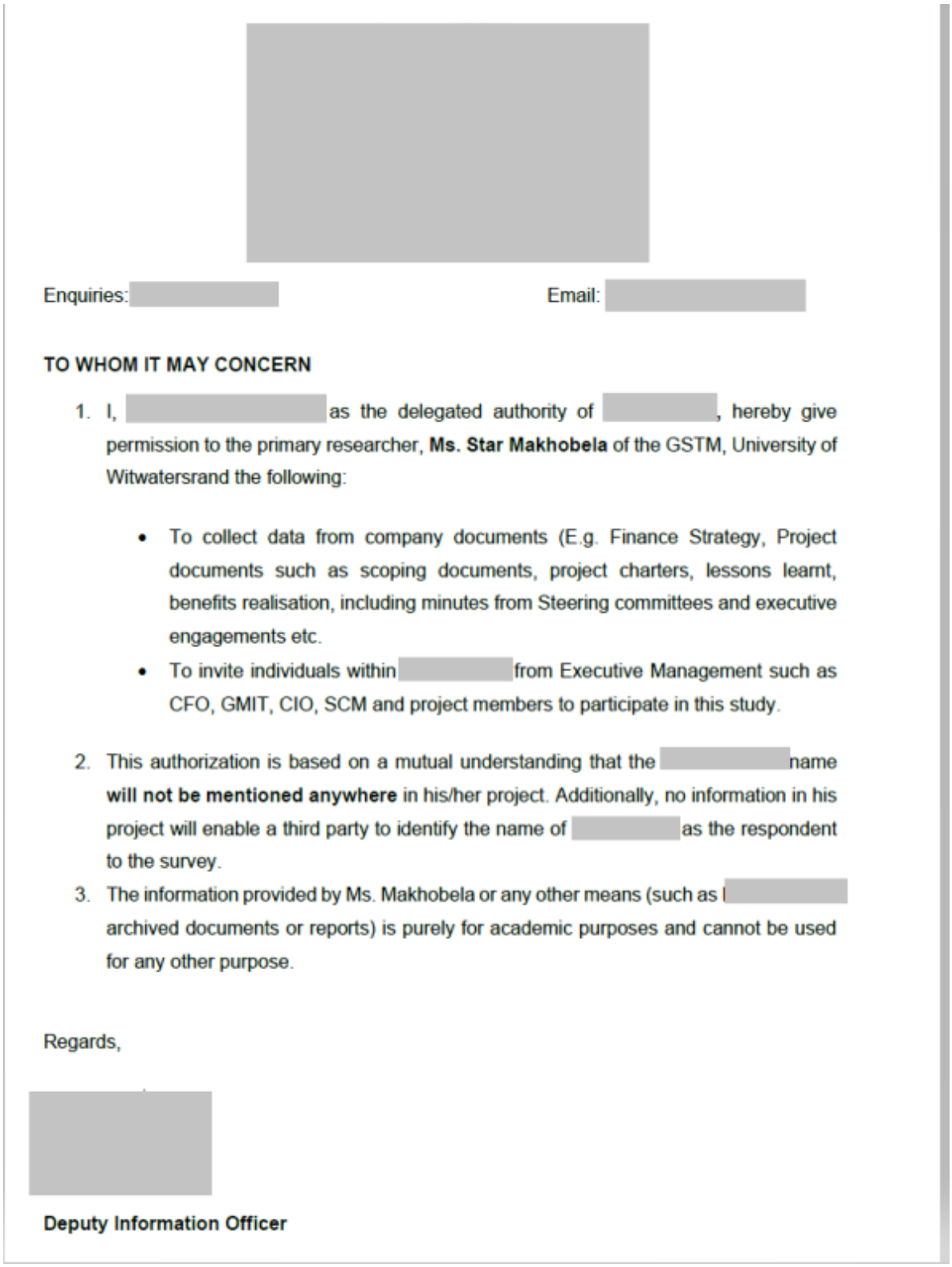
I agree that the information I provide may be used anonymously after this project has ended for academic purposes by other researchers, subject to their own ethics clearance being obtained.

…… (signature)

…… (name of participant)

…… (date)

Appendix C – Permission to Conduct Research in the public entity#



Enquiries: [redacted] Email: [redacted]

TO WHOM IT MAY CONCERN

1. I, [redacted] as the delegated authority of [redacted], hereby give permission to the primary researcher, **Ms. Star Makhobela** of the GSTM, University of Witwatersrand the following:

    - To collect data from company documents (E.g. Finance Strategy, Project documents such as scoping documents, project charters, lessons learnt, benefits realisation, including minutes from Steering committees and executive engagements etc.
    - To invite individuals within [redacted] from Executive Management such as CFO, GMIT, CIO, SCM and project members to participate in this study.

2. This authorization is based on a mutual understanding that the [redacted] name **will not be mentioned anywhere** in his/her project. Additionally, no information in his project will enable a third party to identify the name of [redacted] as the respondent to the survey.
3. The information provided by Ms. Makhobela or any other means (such as [redacted] archived documents or reports) is purely for academic purposes and cannot be used for any other purpose.

Regards,

[redacted]

Deputy Information Officer

Original Document available upon request

Appendix D – Research Instrument: Schedule of interview questions

Research Topic: Implementation of Digital Transformation in a public entity
Interviewer: Star Mokhabela
Interviewee: Participant 11

Aspects	Questions
1.Digital disruption of industries and company's digital transformation (3)	
Overview	1.1 How do you see your industry's digital development? Do you feel that there is an ongoing digital disruption in the industry? If you feel so, how has this unfolded?
	1.2 Is there an ongoing digital transformation in your company? How can it be seen?
	1.3 What are the main drivers of the digital transformation from your perspective?
2. Organisation: Structure, Incentives and Culture (5)	
Executives' role in digital transformation	2.1 How would you describe your **top management team's role** and their **Main Practices** in digital transformation?
	2.2 How about lower-level managers
Strategic Changes	2.3 Has digital transformation **changed the company's strategy**? If it has, how? How has the company been re-organized to advance digital transformation? Has there been any changes; Enabling Processes, Reorganising, Policy, Regulations?
	2.4 Has the organisation **progressed** with implementation of digital transformation? If so, how would you rate the progress?
	2.5 What is company's **investment level** in digital transformation? 3.5 How does the organisation govern investments, Are there **new methods of governance**? (E.g; SCM regulations and processes, project Management, Steerco, Digital committees, Executive escalations, BAC Variation
3. Operations: Processes and IT Capability (12)	
Internal Processes	3.1 Who/which processes are the **key internal implementation Partnerships** that are pivotal to advancing the digital transformation programmes (in priority; department /process) 3.2 and **have they changed** to advance the organisation's digital transformation strategy? SCM, Legal, IT, Training, Finance, Change Management, Top management, other
	3.3 How does the organisation **manage** inter-dependencies across the key processes in integrated delivery of digital transformation ? Are there new internal SLA's?
Measurements/KPIs	3.4 How does the organisation measure digital transformation? Are there new KPIs? 3.5 How does the organisation **measure performance of internal role players** in implementation of digital transformation programmes? Enabling Partners (SCM, legal, infrustructure), Project management, Steering committees, Functional resources
	3.6 How does the organisation **measure the performance of the service provider** implementing the digital systems?
Digital Competence Management	3.7 How would you describe your organisations digital competence management? How does the organisation d**evelop and acquire new competencies**?
	3.8 How would you describe your organisations **capability and Capacity to implement and support** digital programmes? How does the organisation implement and manage implementation? Readiness, enabling processes, Skills, Time, resources

IT Competency	3.9 How would you describe the organisation's **IT Competency** and the role this plays in implementation of digital transformation?
	3.10 How does IT lead, implement and support digital transformation programmes in terms of Project Management (You can drill down aspects of planning scoping, implementation, issue resolution, testing, etc)
	3.11 How does the organisation's **IT infrustructure and architectural landscape support and advance** Digital transformation inrelation to the pace of DT changes in the market 3.12 How would you describe the level **of integration of IT processes in leading** digital transformation; Architecture, Infrustructure and software application?
	3.13 How would you describe the organisations **IT skills** set as compared to the pace of digitilisation in the market.3.14 How does IT **acquire new skills and create new digital roles** and promote continuous learning in digital technologies. 3.15 Describe the **internal capacity/capability to test** new systems requiring new digital competencies?
	3.16 How would you describe the organisations ability and pace of **scaling up pilot projects** or the digital transformation programmes
4. Engagement: Customers, Partnerships and Workforce (10)	
Customers	4.1 What are the intended benefits/enhancements that the organisation **wish** to achieve for its **customers/users** (Describe the ideal end-state of the digital transformation) 4.2 How has the organisation progressed towards achieving this end state. ~~**5.1 How has the outcomes of digital transformation impacted the channels and service offerings to the customers (If none; Opportunities or Intended)**~~
Workforce	4.3 How would you describe the **customers level of readiness to embrace** digital transformation programmes 4.4 How does the organisation ensure adaptation and embed the change 4.12 How would you describe your organisation's cultural change management maturity levels towards digital transformation?
	4.14 Describe to what extent does the digital products offer high levels of usability and posses carefully designed aesthetic properties for maximum user adoption?
	4.15 What is your perception on employee involvement/resource availability and levels of engagement during implementation?
	4.16 How does the organisation support, incentivise or reward outstanding participation for the workforce
External Partnerships	4.2 How does the organisation **source external partnerships**? Describe entire process; scoping to SCM processes, and legal contracts
	4.9 In your opinion, what would be the **best practises** to source service providers; cost structure; fixed pricing
	4.10 What does the organisation consider as critical is sourcing external services, what is included and excluded and how has this played out; Infrustructure, support, licencing, change management, etc
	4.11 Has the organisation's external partnerships in implementation advanced the organisation's digital transformation strategy? Implementation Partners, Systems, OEMs, Support
5. Go to Market: Offerings and Channels (2)	
	5.1 How has the otcomes of digital transformation impacted internal or external business processes? 5.3 How has the organisations ways of working changed with the outcomes of digital transformation?

Appendix E – Ethics Clearance Certificate

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/BA0307464X/477
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

Project title	Implementation of digital transformation in a public entity
Investigator / Researcher	Mrs Kolwani Mokhabela
Nature of Project	MBA (Research Article)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentiality.
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.

Star Mokhabela Digitally signed by Star Mokhabela Date: 2022.09.12 10:35:32 +02'00'

Signature

12 September 2022

Date:

Appendix F – Data Analysis Network Maps

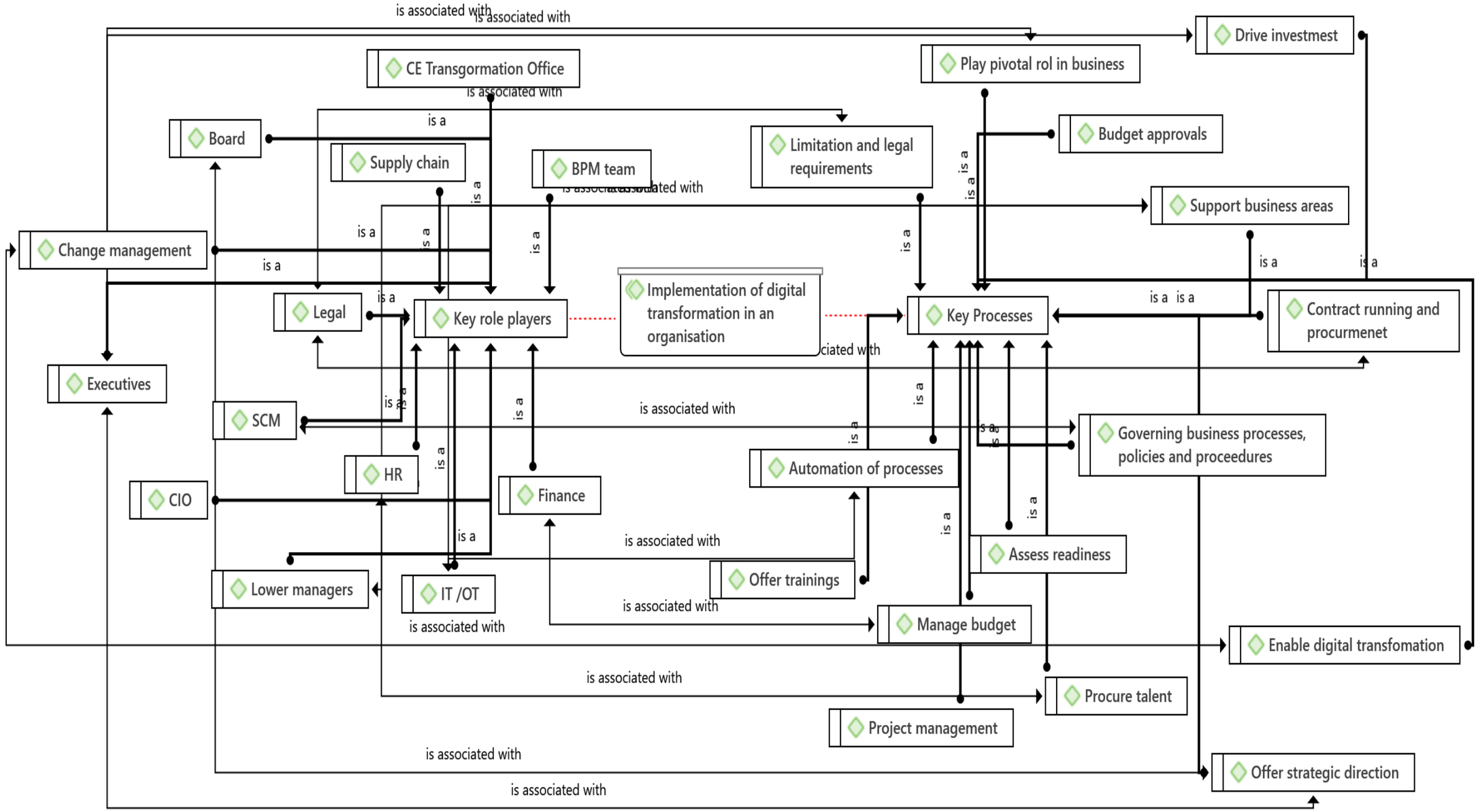


Figure F.1: Implementation of Digital transformation in the public entity

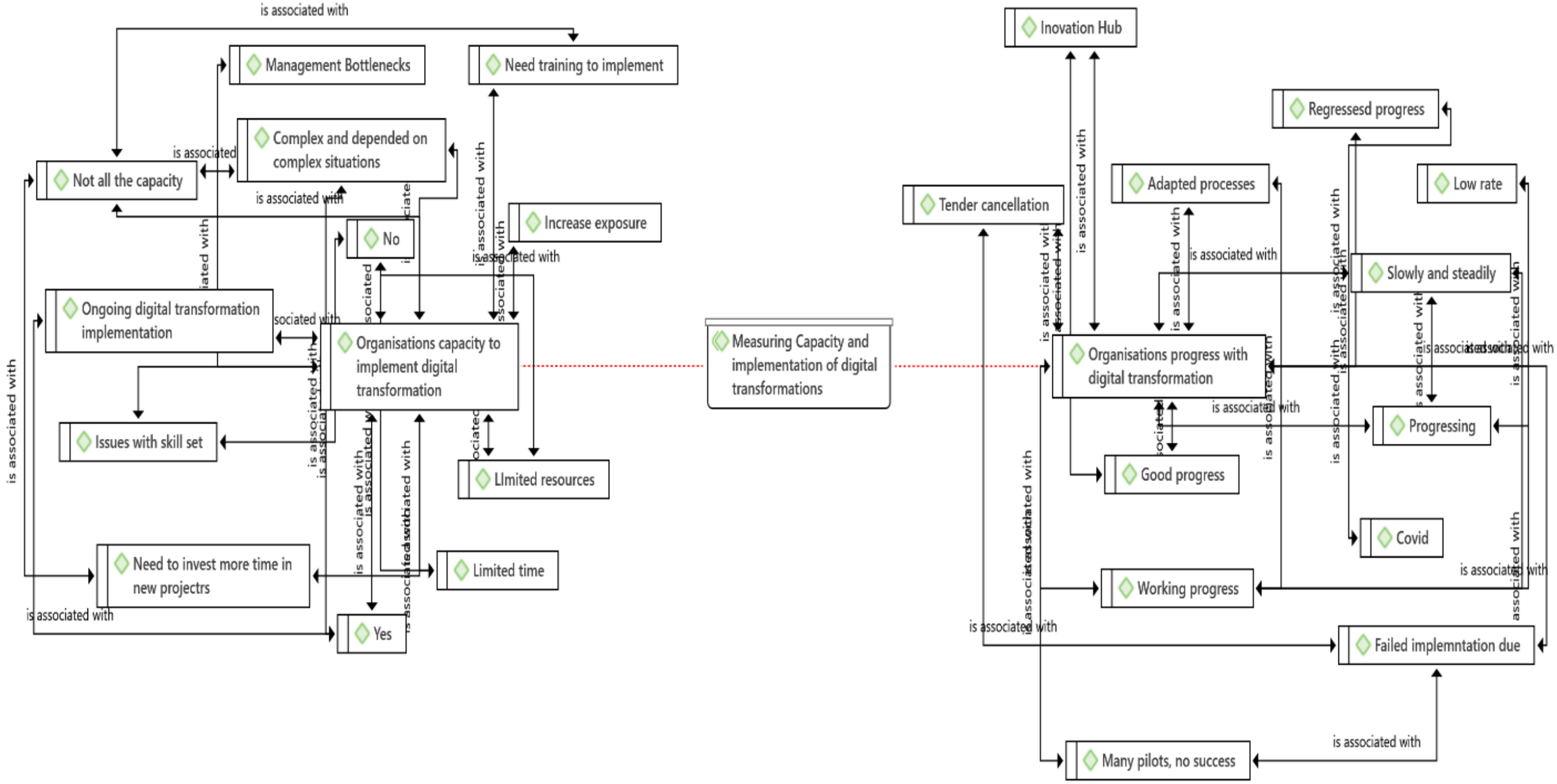


Figure F.2: Measuring the capacity and implementation of digital transformation

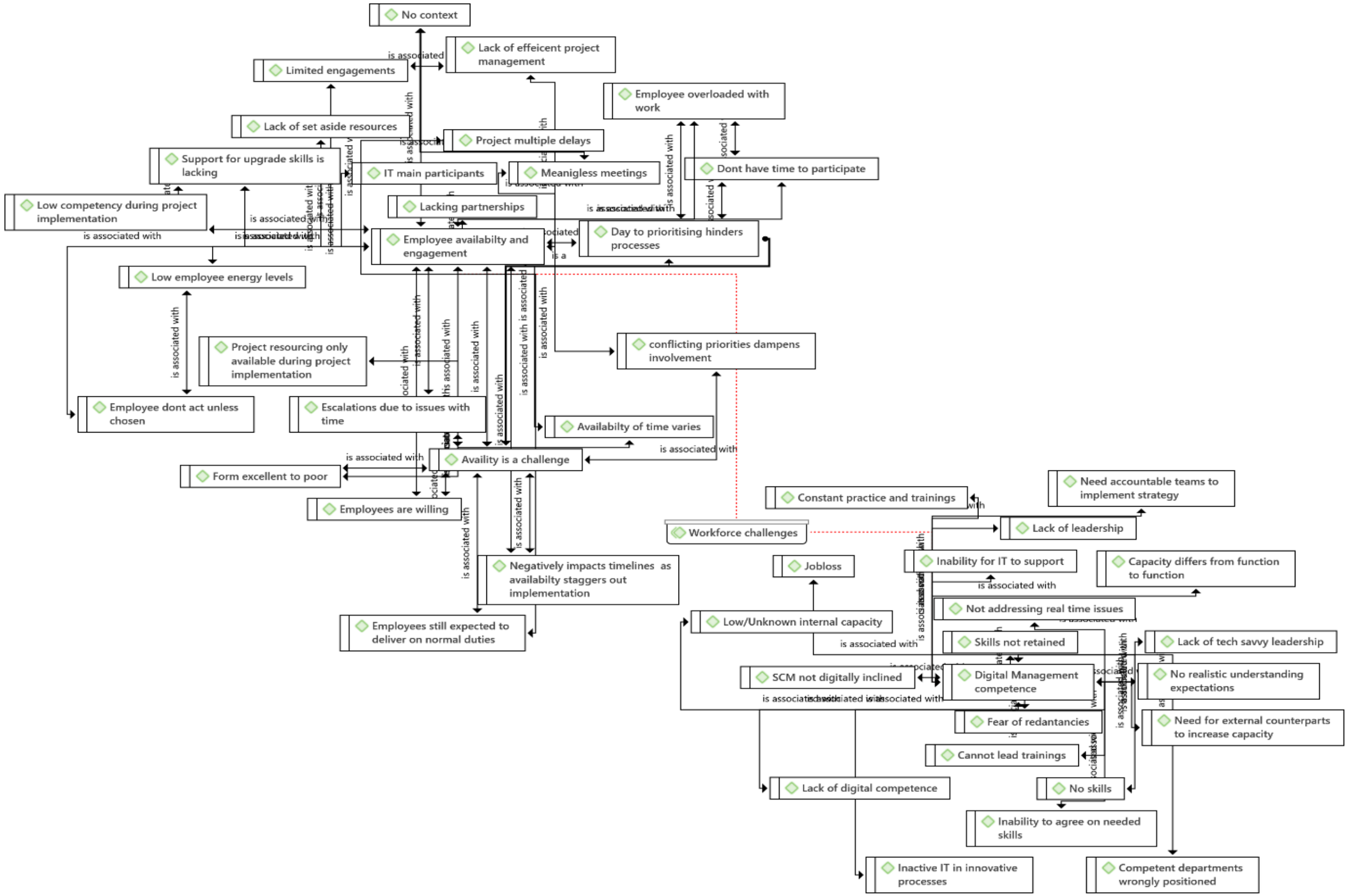


Figure F.3: Workforce challenges

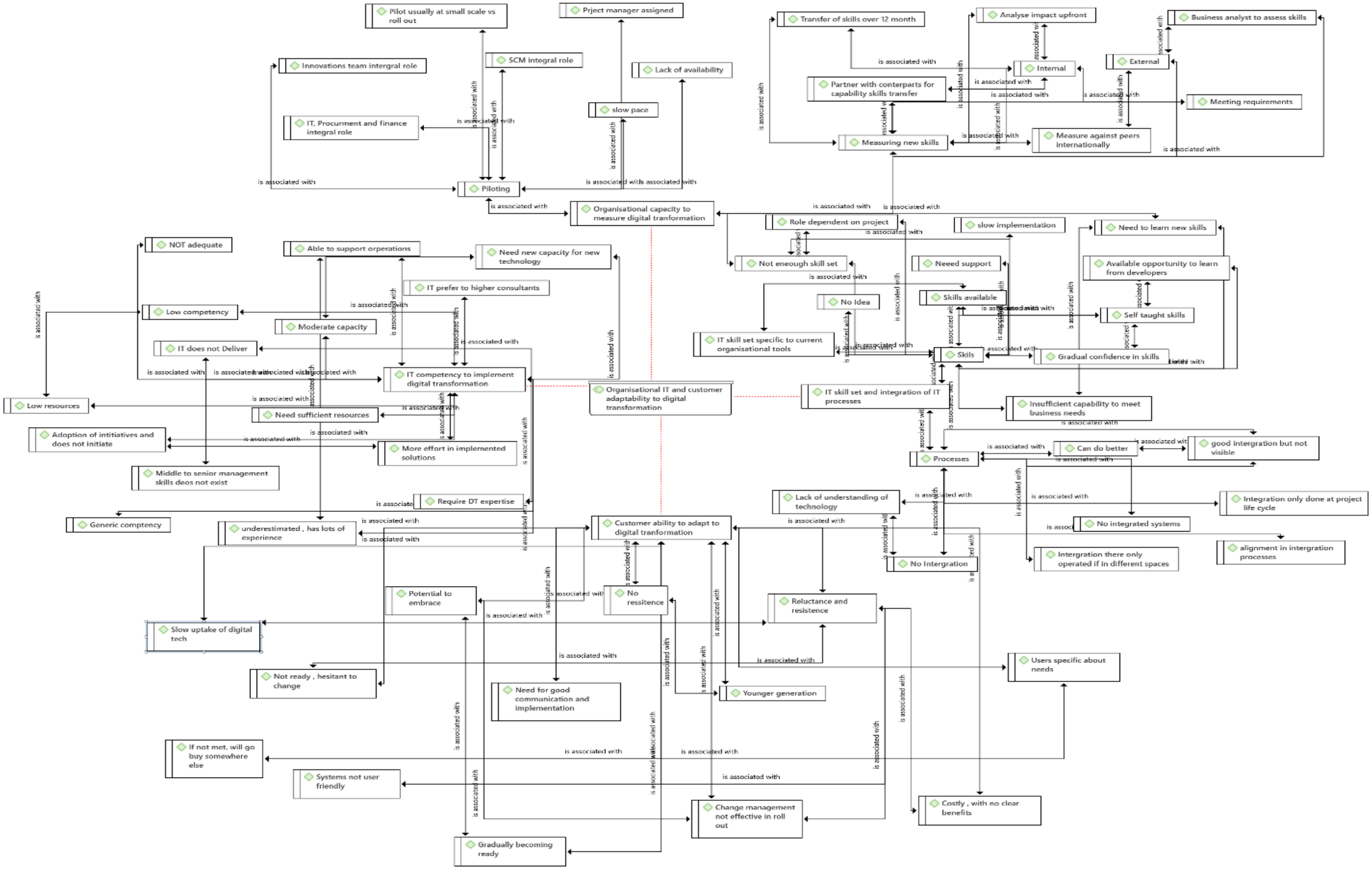


Figure F.4: Public entity's IT and customer adaptability to digital transfer

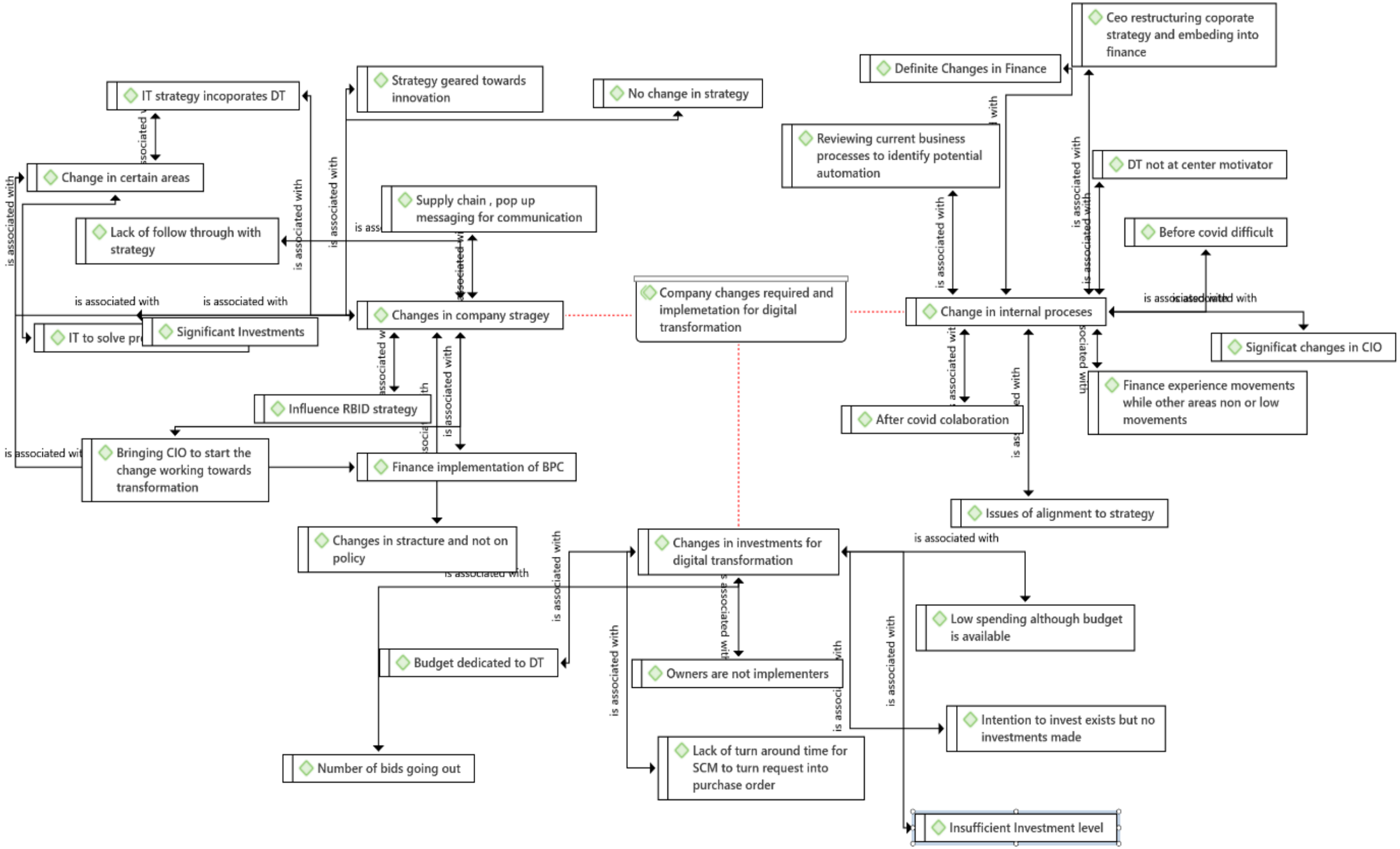


Figure F.5: Public entity changes required for digital transformation

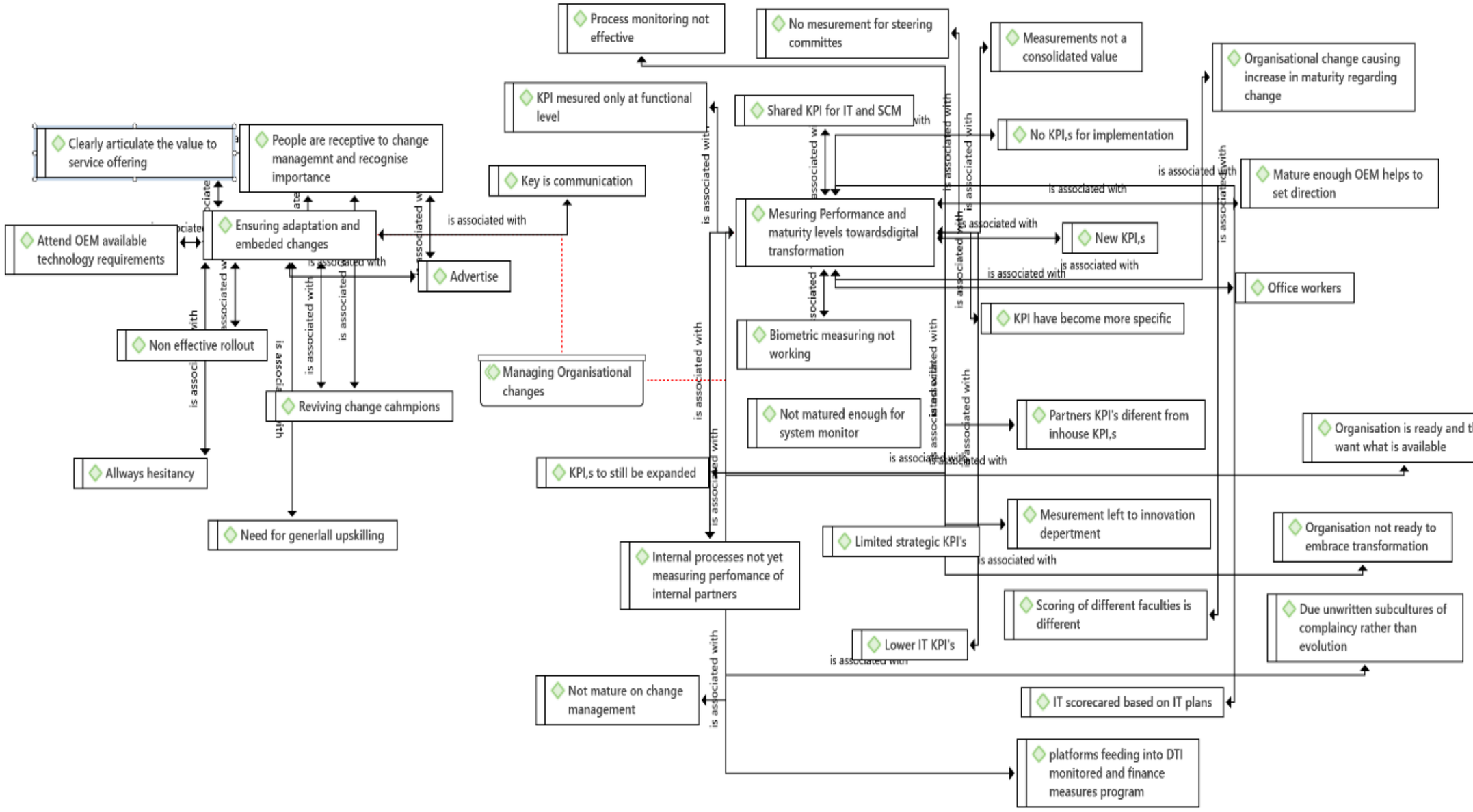


Figure F.6: Managing the public entity's changes for digital transformation

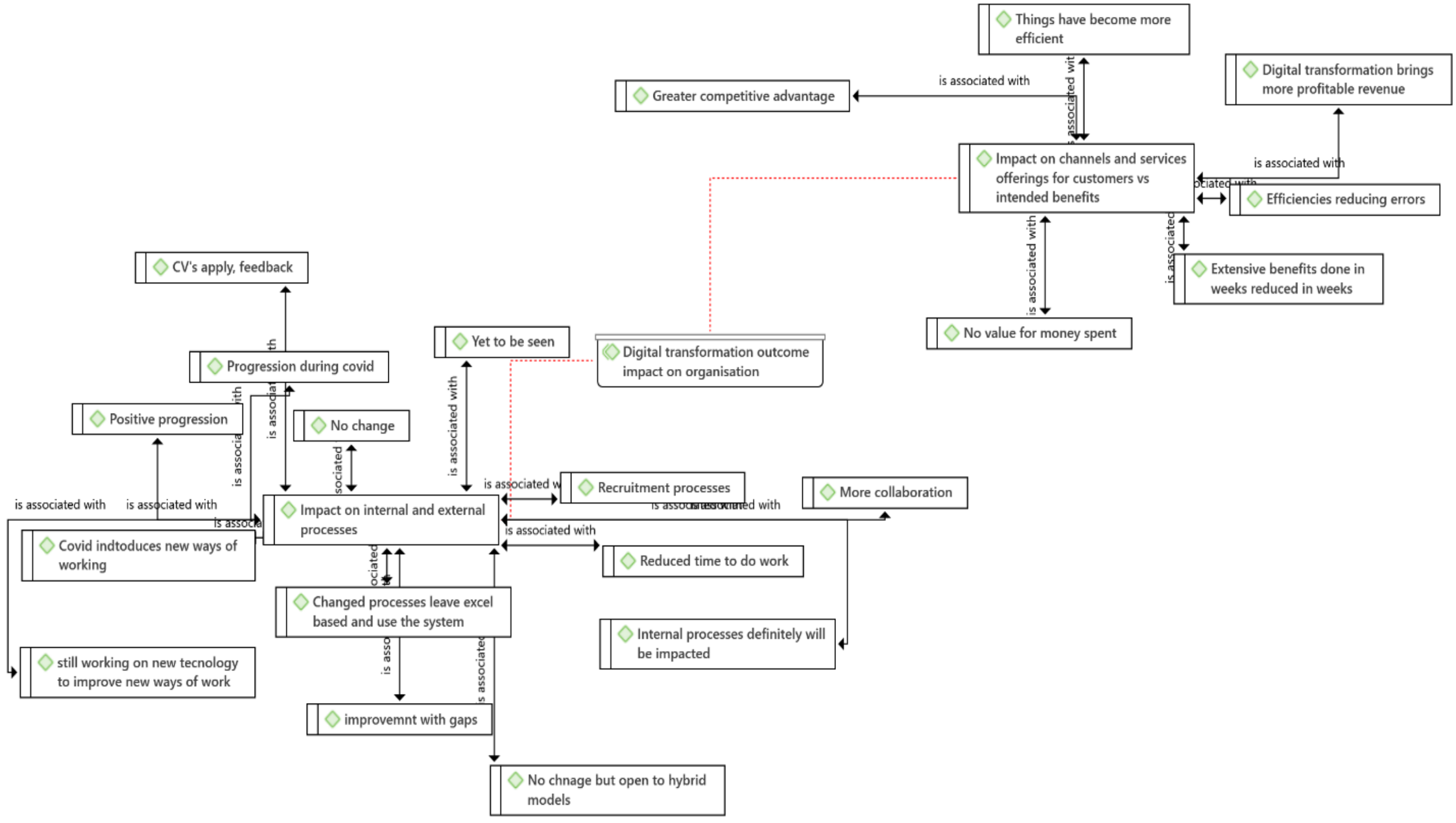


Figure F.7: Digital transformation outcome impact on the public entity

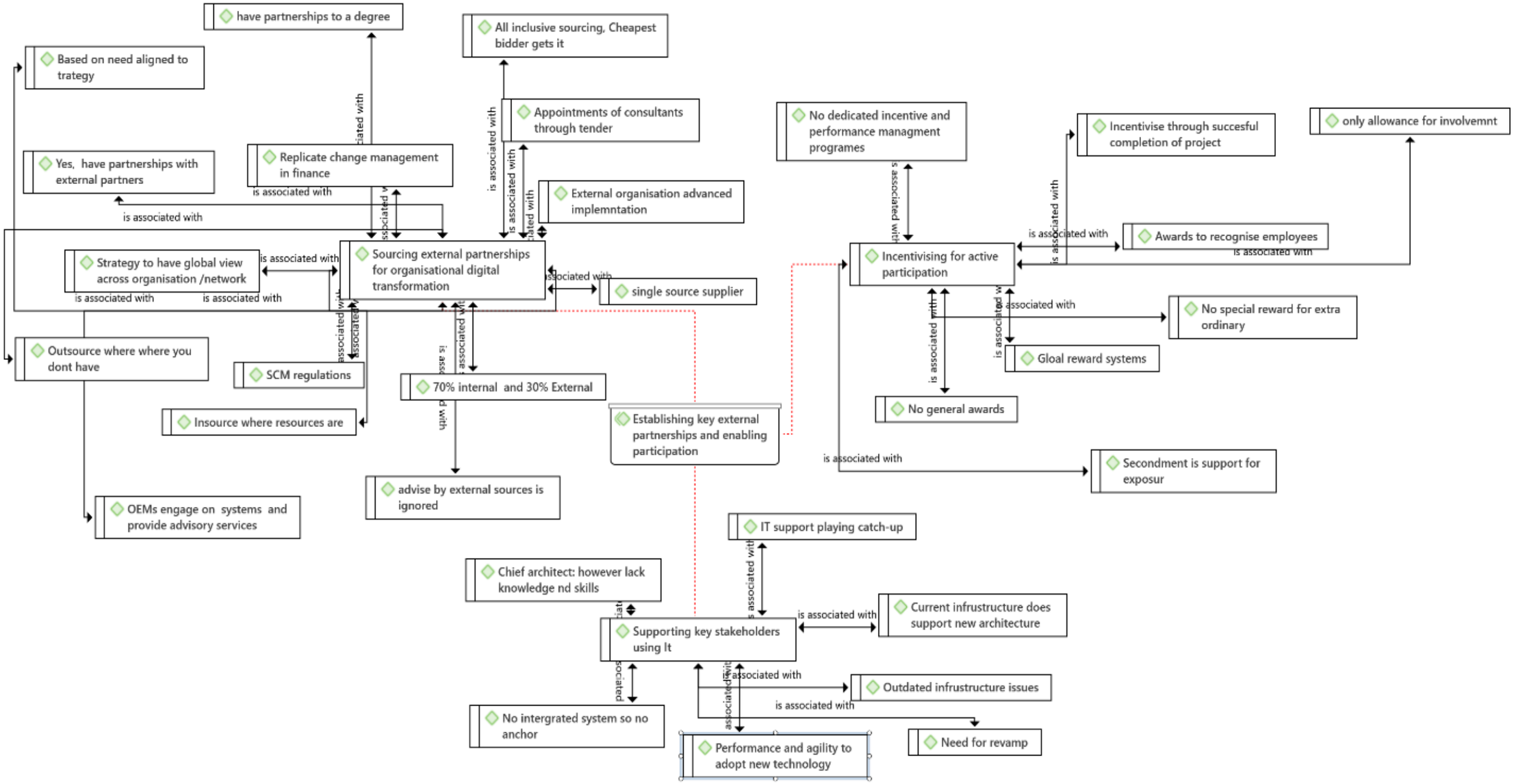


Figure F.8: Strategies that can be adopted within the public entity to successfully implement Digital Transformation

Appendix G – Supporting data to Recommendations

Best practice recommendations for DT:

	Study Recommendations
CULTURE	Create measurable, tangible targets for senior and junior management with accountability and lucrative rewards and recognition opportunities. Manage deliverables and not people and hold people accountable for lack of performance through direct engagements. Assess also the nature and requirement of the type of work. (Kraus et al., 2022)
	Establish and Standardise Change Management approaches and ensure ON THE GROUND impact is seen, felt and tangible, not only on paper. Formalise Knowledge Transfer procedures during implementation to build up the internal capacity to support employees. (Danielsen et al., 2022; Tsolkanakis, 2022)
	It is imperative that all business leaders and managers (especially middle managers) be assessed for digital capability and literacy to mitigate the fear of innovation and resistance to change (Aidanpää & Sjöberg, 2021; Paavola, 2020).
CUSTOMER	The importance of developing user-friendly digital systems in relation to end-user/customer take-up cannot be overstated (Nwozor et al., 2022; Sutcliff et al., 2019).
	Maintaining open channels of communication between IT and BUs will go a long way to mitigate risk and change aversion (Papavasiliou, 2020; Syed et al., 2022)
ORGANISATION	Appoint and reward skills at the right level. Incentivise employees and create secondment opportunities that can release employees from normal day-to-day and pay dedicated attention to DT. (Davenport & Westerman, 2018; Meyerhoff Nielsen, 2019)
	Source an external strategic partner within the ambits of public regulations with multiple skills and digital competencies to implement DT, transfer skills and provide extended support to ensure sustainability and independence of internal teams. (Cem et al., 2021; Hai et al., 2021)
	Establish clear policies and road map based on where the organisation wants to invest, e.g., driven by ERP future preference, available infrastructure and cyber-crime mitigation capabilities. Data, infrastructure and architecture alignment and roadmap will pre-determine which technological skills to invest in and develop in-house rather than a reactive approach as a result of unknown procurement outcomes. (Benjamin & Potts, 2018; Kraus et al., 2021; Jonathan, 2020; Schneider & Kokshagina, 2021)
	Expand on PMO establishment to cater for corporate-wide DT with cross-functional representation. DT programmes must be prioritised alongside the prioritisation of infrastructure. (Agostino et al., 2021; Johansson, 2022)
	Implement corporate-wide performance monitoring systems that cater for cross-functional dependencies in Programme Management (Norling et al., 2022; Zuiderwijk et al., 2021).
	Formalise IT partnerships with BUs (Papavasiliou, 2020; Syed et al., 2022).

Study Recommendations	
PEOPLE	Focussed investment in the IT department to obtain the new digital skills and capabilities required to realise DT (Gong & Ribiere, 2021; Manda & Backhouse, 2017).
	Focused strategies on upskilling current and bringing in new digital competencies (Brown & Brown, 2019; Sichaanji, 2022).
	Employee boot camps, hackathons, huge online courses, and rotation opportunities can be added to the normal suite of training programmes. Leaders can collaborate with universities, incubators, and other organisations to access crucial talent.
	Future workplaces should be pleasant and adaptable. Home offices, mobile working, desk sharing, and digital workspaces motivate employees, reduce infrastructure costs, and attract digital-savvy employees. (Bumann & Peter, 2019)
STRATEGY	Strategically create a pool of specific specialised skills based on the selected strategy/direction of the organisation, e.g., SAP and Oracle intensive skills that can be shared and create longer support contracts to ensure beneficiation and knowledge transfer to internal staff (Gangneux & Joss, 2022; Press et al., 2021).
	Executives to cascade strategy into actionable implementation roadmap. Elevate DT as a strategic programme, creating enabling policies and integrated processes, including an agile SCM. (Kitsios & Kamariotou, 2021; Shreya, 2022)
	Nurture an environment of the sensory business capability to remain abreast of technological developments, e.g., participate in seminars and conferences concerning DT (Manda & Backhouse, 2017; Zachari, 2022). Consult businesses which have effectively adopted DT for guidance (Kraus et al., 2021; Jonathan, 2020).
TECHNOLOGY	Robust post-implementation audits to ensure beneficiation, continuous improvements and support. Focus on user experience and continuously seek ways to improve the adaptability of employees and customers at large. Implement digitisation that drives efficiencies and cost-effectiveness, Real-time information, predictive analytics, and Robotics processing. (Goh & Arenas, 2020; Hai et al., 2021)
	Assess the gains that can be made by technological advancements, and leverage cost savings from remote working. Establish a Hybrid policy and test functionality to assess behavioural issues and accountability aspects. (Cichosz et al., 2020; Gomez-Trujillo & Gonzalez-Perez, 2021)
	Cybersecurity must be at the heart of the development of e-systems or the exploitation of new technologies (Mergel et al., 2019; Mu et al., 2022).
	Care must be exercised in developing digital solutions that are interoperable with other digital systems. Also, while experimenting, maintain two parallel systems so as to not compromise service delivery. (Agostino et al., 2021; Ahn & Chen, 2022; Reis et al., 2018)

Further Strategies from Literature:

1. Use successful digital technology that practitioners truly desire (Cichosz et al., 2020; Gomez-Trujillo & Gonzalez-Perez, 2021)
2. Enhance the cybersecurity of e-systems (Mergel et al., 2019; Mu et al., 2022)
3. The budget for research and development of digital transformation systems should be increased (Gong & Ribiere, 2021; Manda & Backhouse, 2017)
4. Hire qualified candidates who meet the current skill needs (Davenport & Westerman, 2018; Meyerhoff Nielsen, 2019)
5. Develop user-friendly digital systems (Nwozor et al., 2022; Sutcliff et al., 2019)
6. Use data analytics to improve firms' existing digital systems (Goh & Arenas, 2020; Hai et al., 2021)
7. Convince corporate organisation members to be receptive to digital transformation (Norling et al., 2022; Zuiderwijk et al., 2021)
8. Develop digital solutions that are interoperable with other digital systems (Ahn & Chen, 2022; Reis et al., 2018)
9. Develop corporate policies that support digital transformation (Benjamin & Potts, 2018; Schneider & Kokshagina, 2021)
10. Create an R&D team for digital transformation systems (Goh & Arenas, 2020; Nadkarni & Prügl, 2021)
11. Participate in seminars and conferences concerning digital transformation (Manda & Backhouse, 2017; Zachari, 2022)
12. Consult businesses which have effectively adopted digital transformation for guidance (Kraus et al., 2021; Jonathan, 2020)
13. Abandon old technologies and adopt digital transformation (Agostino et al., 2021; Johansson, 2022)
14. Properly instructing staff on how to apply digital transformation technologies (Danielsen et al., 2022; Tsolkanakis, 2022)
15. Enhance the capacity to quickly adopt emerging digital business technology (Brown & Brown, 2019; Sichaanji, 2022)
16. Develop the capacity to identify and conceive digital transformation methods (Gangneux & Joss, 2022; Press et al., 2021)
17. When experimenting with digital transformation, maintain two parallel systems (Agostino et al., 2021)

18. Be adaptable as a leader to garner employees' support (Kraus et al., 2022)
19. Maintain open channels of communication between IT and other departments (Papavasiliou, 2020; Syed et al., 2022)
20. When designing digital strategy, account for the desires of customers and clients (Kitsios & Kamariotou, 2021; Shreya, 2022)
21. Select providers of digital transformation solutions with care (Cem et al., 2021; Hai et al., 2021)