The influence of Covid-19 and remote working on the agile methodology within a South African bank

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ABSTRACT

The advent of the Covid-19 pandemic accelerated the digital transformation of organisations via many initiatives inclusive of remote working. Many organisations that had adopted agile methodologies to execute project delivery were forced to transition from face-to-face interactions to virtual interactions. Given this required change, it was prudent to establish what the influence on the agile methodology would be in the absence of face-to-face interactions which enable adherence to the agile values and principles.

This study explores the influence of Covid-19 and remote working on the agile methodology of a South African bank.

Qualitative research using semi-structured interviews was conducted. The population of the study were employees of the retail division of the bank that worked on agile projects. The sample included management and execution roles within the agile teams.

The study found that Covid-19 had accelerated digital transformation in the bank through remote working. The integration of remote working technology into the daily work activities of employees introduced new ways of work. There were adverse effects on employee wellbeing though. Remote working had improved the productivity of the agile teams in the bank through improved collaboration, team integration and adherence to the agile values and principles. The bank experienced an overall increase in its agile maturity. How Principle 6 of the Agile Manifesto was influenced by remote working was inconclusive because of the disparate views on the effectiveness of virtual interactions compared to face-to-face interactions.

There were several challenges highlighted in the study with respect to the influence of Covid-19 and remote working on the agile methodology. A hybrid working model where employees work from home several days a week was recommended to address these challenges. The study also surfaced several avenues of future research into the continued relevance of the Agile Manifesto in the context of remote working and new delivery approaches.

KEY WORDS

Agile methodology, remote working, digital transformation, Covid-19, Agile Manifesto, virtual interactions, Principle 6

DECLARATION

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

Name: Signature:

Signed at ……

On the …….. day of …… 20…..

DEDICATION

This report is dedicated to those who continually seek to learn.

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LIST OF ACRONYMS

Acronym	Term
AST	Adaptive structuration theory
Covid-19	Coronavirus disease
FDD	Feature driven development
FinTech	Financial technology
IS	Information systems
IT	Information technology
SDLC	Software development life cycle
XP	Extreme programming

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The aim of the study is to explore the influence of Covid-19 and remote working on the agile software development processes in a traditional bank. This research is a case study based on one of the major banks in South Africa that has implemented agile software development practices as part of its digital transformation journey and has subsequently introduced remote working because of Covid-19.

1.2 Context of the study

Innovative digital technologies such as social media and artificial intelligence amongst others are redefining the competitive structures of industries and the preferences of customers within these industries (Teichert, 2019; Verhoef et al, 2021). These digital technologies also include collaborative technologies which are changing workplaces by introducing remote working (Henriette et al, 2016). To remain competitive against this backdrop of innovative digital technologies, companies are compelled to adopt these technologies in pursuit of digital transformation (Riasanow et al, 2018). However, digital technology is not the sole focus of digital transformation (Teichert, 2019) as it also encompasses the reengineering of business processes (Verhoef et al, 2021) and changes to an organisation's structure (Hess et al, 2016) and culture (Štemberger, 2019). A key objective for companies is the suitable utilisation and implementation of digital technology to boost business performance (Diener & Špaček, 2021) which requires implementation of the other elements of digital transformation. This necessitates organisational agility because of the continuous change in the environment and more companies are adopting agile methodologies to manage the challenges posed by digital transformation (Fuchs & Hess, 2018).

In March 2020, the South African government imposed a lockdown on the country in an attempt to restrict the spread of the Covid-19 virus and save the lives of millions of citizens. South Africans had to stay at home and only essential service workers were exempted including banking services (BusinessTech, 2020). When the lockdown was lifted, social distancing became part of everyday life. Covid-19 made it imperative that companies interact with customers digitally as the traditional customer engagement models of most industries had been disrupted by quarantines (Dragan, 2021). Even though social distancing is not as severe as a quarantine, it nevertheless drove the importance of online applications to ensure that companies continued to provide services to their customers (Papagiannidis et al, 2020). This has also been evident in banking where social distancing has emphasised the need for banking services to be digitally transformed (Amrani & Najab, 2020). The threat posed by Covid-19 has disrupted traditional banking models and caused a shift towards internet banking (Naeem & Ozuem, 2021). However, Covid-19 has not only changed how organisations interact with customers, but has also affected the workplace by highlighting the advantages of remote working (Fletcher & Griffiths, 2020) and by driving the digital transformation of the workplace through remote working (Gruia et al, 2020).

In fact, Covid-19 has made digital transformation mandatory for all organisations in all industries, affecting customers and employees alike (Fletcher & Griffiths, 2020).

Traditional banks are undertaking digital transformation to address the challenges of changing customer preferences and intense competition from FinTechs that innovative digital technologies introduce (Metzler & Torno, 2021). Retail banks specifically, have been at the vanguard of digital innovation which require alterations to conventional banking models and are implemented through digital transformation (Diener & Špaček, 2021). Covid-19 did not initiate these digital transformation initiatives in banking, it just introduced additional urgency for these initiatives to be implemented.

Against this backdrop of a pandemic, intensified competition and changing customer behaviour characterised by unpredictability and rapid change, companies more than ever need organisational capabilities to implement digital transformation initiatives successfully. Agile methodologies show promise in enabling companies to respond and adapt quickly to these environmental changes which is critical for companies to remain competitive (Sommer, 2019). Hence the importance of agile methodologies in the implementation of digital transformation in this demanding environment. The fact that companies are increasingly adopting agile methodologies to negotiate digital transformation in the midst of new digital technologies and changing customer preferences (Guinan et al, 2019) corroborates this.

The South African bank that is the subject of the study has also implemented agile software development practices as part of its digital transformation journey.

These agile software development practices have been shaped by the principles advocated in the Agile Manifesto where the fundamental aspect is self-organising teams that are co-located, collaborate with customers and adjust to changing requirements (Dingsør et al, 2012). The Agile Manifesto espoused four values and twelve principles that defined the crux of being agile (Al-Saqqa et al, 2020).

Principle 6 of the Agile Manifesto states that “The most efficient and effective method of conveying information to and within a development team is face-to-face conversation” (Beck et al, 2001, Para. 1). To achieve this effective communication, the agile methodologies advocate for teams that are located in the same physical environment (Green et al, 2010).

The four values and twelve principles will be provided in Chapter 2 as part of the literature review.

There are a range of agile methodologies which include the scrum methodology, extreme programming (XP), feature driven development (FDD) and the crystal methodologies (Al-Saqqa et al, 2020; Crişan et al, 2015; Fustik,

2017; Oyong & Ekong, 2019). Scrum is the agile methodology selected by the bank and was subsequently implemented throughout the information technology (IT) structures in the bank.

The scrum team is made up of the product owner, the scrum master and the development team (Al-Saqqa, 2020; Perkusich et al 2017; Sasmito & Nishom, 2020).

The outputs of the scrum team are achieved via sprints which are iterations that are of a fixed length of time usually up to four weeks in duration (Al-Saqqa et al, 2020; Fustik, 2017; Morandini et al, 2021). During sprints, there are four meetings that are conducted which are the sprint planning, the daily scrum, the sprint review and the sprint retrospective (Al-Saqqa, 2020; Fustik, 2017; Perkusich et al, 2017; Sasmito & Nishom, 2020). Perkusich et al (2017) emphasised the criticality of these meetings.

Each individual IT department in the bank set up scrum teams to deliver on projects. These scrum teams were co-located and there were dedicated workspaces for the teams to collaborate and execute on deliverables daily. The sprints and the four meetings mentioned above were conducted in person in accordance with Principles 4 and 6 of the Agile Manifesto which state “Business people and developers must work together daily throughout the project.” (Haig-Smith & Tanner, 2016, p.123) and “The most efficient and effective method of conveying information to and within a development team is a face-to-face conversation.” (Haig-Smith & Tanner, 2016, p.123) respectively. Thus, due to the teams being co-located and the face-to-face nature of the sprints and meetings, it can be argued that the teams were operating in an analogue fashion.

Although banking services were exempted from the lockdown, the bank made a decision that non-customer facing staff would work from home as part of the bank’s efforts to keep employees safe. The scrum teams developing software for the bank could no longer commute to their place of work prior to Covid-19 and had to digitally transform the incumbent analogue practices. Remote

working was required given the elimination of any face-to-face interactions in order to adhere to the Covid-19 health and safety protocols. In one fell stroke, digital transformation of the workplace through remote working was imposed on the scrum teams where they had to transition from analogue to digital, influencing the agile values and principles and their ways of work.

This enforced transition is not unique to IT project teams in a bank. Agile practices are progressively being adopted in other functional departments in large organisations (Kettunen et al, 2019). Nor is this enforced transition unique to South Africa as the same scenario played out in countless organisations globally which had introduced agile methodologies in software development and other operations where their governments had imposed lockdowns in response to the Covid-19 outbreak.

1.3 Research problem

For many organisations around the world that utilised agile methodologies either in software development or other operations, Covid-19 prescribed a shift from the analogue version of face-to-face communication to the digitally transformed environment of virtual meetings (Mancl & Fraser, 2020). This imposition of remote working was necessary to adhere to the Covid-19 health and safety protocols. The bank was no exception with the agile teams working remotely during the Covid-19 lockdown. In this remote working environment, adherence to Principle 6 of the Agile Manifesto which requires face-to-face interaction between team members was no longer possible.

The problem is establishing how Covid-19 and remote working has influenced the agile methodology and especially the influence on Principle 6 since it is not clear what remote working has lost when compared to face-to-face communication. This perspective is substantiated by Badiale (2020) who posited that the influence of Covid-19 on communication in an agile context needs to be explored. Other studies have further corroborated the existence of this problem. Kadasah and Alabdulmohsin (2021) investigated the effect of

Covid-19 and remote working on the Agile Manifesto. Another study by Karlsson and Skötte (2021) explored the effect of Covid-19 on agile teams in small and medium sized Swedish companies.

In addition, face-to-face communication conveys information not only through words but through body language which displays emotion and infuses the information with credibility and realism (Lampropoulos & Siakas, 2018). When communicating virtually, it is very difficult to pick up on body language and emotion especially if there is no video. Thus, further understanding is required in how this loss translates into changing the communication dynamics of the agile teams and if it introduced any potential degradation in the effectiveness of the teams and their delivery cadence. The work by Karlsson and Skötte (2021) and Badiale (2020) that focussed on the effects of Covid-19 on the communication of agile teams justifies this perspective of the research.

Marek et al (2021) investigated the effect of Covid-19 on the online collaboration tools used by agile teams. Thus, it would also be beneficial to understand which digital tools have been adopted for remote working and how to effectively utilise them to replace face-to-face communication and how virtual communication can compensate for the characteristics it lacks compared to face-to-face communication.

Furthermore, it was intuitive that Covid-19 and remote working would have an influence on Principle 6 of the Agile Manifesto. How this has influenced the four foundational values of agile and the other eleven principles of the Agile Manifesto still needs to be established.

1.4 Research questions

To explore the research problem, the following research questions were posed in the study:

Main question: How has Covid-19 and remote working influenced the agile methodology?

Sub-question 1: How has Covid-19 influenced remote working?

Sub-question 2: How has remote working influenced the agile methodology?

Sub-question 3: How has Principle 6 of the Agile Manifesto been influenced?

1.5 Significance of the study

The significance of the study is that it can provide some insights into how Covid-19 and remote working have influenced the agile methodology. The researcher found a bibliometric study that uncovered articles that explored the effect of digital transformation on agility, innovation and organisational change management utilising a bibliometric review (Gerster, 2017) but the articles analysed did not investigate how digital transformation in the context of remote work and virtual offices would affect the values and principles of the Agile Manifesto.

The study will contribute to the academic knowledge because it will provide insights on how Covid-19 has influenced digital transformation specifically in the context of remote working and virtual offices. Furthermore, this study will contribute to the academic knowledge by investigating how remote working has influenced the agile methodology.

This research may also provide value to the many organisations that adopted the agile methodology, not only to deliver on their digital transformation projects, but other strategic projects and operations as well, and have subsequently been affected by Covid-19.

1.6 Delimitations of the study

The focus of the study was a South African bank that had implemented the agile methodology of scrum to implement projects. Specifically, the study concentrated on the agile teams that operate within the retail banking unit of the

bank. The study excluded the broader ecosystem that the agile teams interact with.

The focal point of the study was the influence of Covid-19 and remote working on the agile methodology of the bank and did not extend to the influence on the IT function or other areas of the bank. It also did not explore the influence that agile methodologies have on digital transformation.

1.7 Definition of terms

Table 1: Definition of terms

Term	Definition
Agile methodology	An agile methodology is "characterized by collaborative social interactions and fast-paced and iterative changes in project requirements" (Zaitsev et al, 2020, para. 1).
Covid-19	Coronavirus disease (Covid-19) is a highly transmissible disease that affects the respiratory system and is caused by a novel coronavirus (Petrosillo et al, 2020).
Digital transformation	Digital transformation is "the process through which companies converge multiple new digital technologies, enhanced with ubiquitous connectivity, with the intention of reaching superior performance and sustained competitive advantage, by transforming multiple business dimensions, including the business model, the customer experience (comprising digitally enabled products and services) and operations (comprising processes and decision-making), and simultaneously impacting people (including skills talent and culture) and networks (including the entire value system)". (Ismail et al, 2017, p. 6)
Remote working	Remote working or working from home refers to work that takes place in places other than the sites or offices supplied by employers. (Aronen, 2017; Murray, 2020).

1.8 Assumptions

The major assumption made was that the bank has adopted and implemented the values and principles of the Agile Manifesto. A further assumption was that the participants would provide honest and comprehensive answers to the

questions that reflect the standard perspectives and experiences of the population.

1.9 Structure of the report

Chapter 1 provides the context of the study in terms of purpose and background. The research problem and the research objectives are presented. Furthermore, the significance of the study, the delimitations and assumptions are outlined.

Chapter 2 provides the literature review of the study expanding on the definitions of digital transformation, remote working, Covid-19 and agile methodology. The theoretical framework is established and prior studies on the topics of digital transformation, Covid-19 and digital transformation in the context of remote working, and the agile methodology in the context of Covid-19 and remote working influences, are reviewed.

Chapter 3 outlines the research methodology and elaborates on the research approach, design, data collection methods, population, sampling and the research instrument. The data collection procedure, data analysis and interpretation are discussed. In addition, the limitations, transferability and dependability of the study and the ethical considerations are reflected upon.

Chapter 4 provides the research findings resulting from the analysis and interpretation of the data collected.

Chapter 5 discusses the research findings in further detail.

Chapter 6 draws conclusions on the research and provides recommendations for future research.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

The objective of the research was to identify how Covid-19 and remote working had influenced the agile methodology of a South African bank. Insights and perspectives on Covid-19, digital transformation in the context of remote working and agile methodologies were necessary to structure and direct the research to meet the stated objectives. A literature review of prior research was undertaken to gain these insights and perspectives. The definitions of the abovementioned concepts will be expanded upon. Furthermore, prior research into these concepts will be discussed.

2.2 Theoretical framework

Adaptive structuration theory (AST) was selected as the theoretical research lens to apply in the study. DeSanctis and Poole (1994) stated that “AST provides a model that describes the interplay between advanced information technologies, social structures, and human interaction” (p. 125). It investigates the organisational change enabled by different structures emanating from advanced technologies, tasks and organisational contexts (Cao et al, 2009).

AST was utilised by Cao et al (2009) as the theoretical basis in a study that sought to understand how agile methodologies could be modified and adopted in different circumstances and made further mention that AST was utilised to investigate the dynamics of a global remote working team.

Naik and Kim (2010) studied the success factors of virtual teams and developed their Extended AST Framework on AST.

Using AST as a theoretical research lens, Fuchs (2019) found that the interaction between agile methodologies and organisational characteristics lays

the foundation for organisational change based on a process of mutual adaptation.

There was significant alignment between the focal points of the research and the elements of the AST model. Digital transformation through remote working had introduced advanced information technologies and Covid-19 and the agile methodology would have influenced social structures and human interaction in organisations. In addition, several studies utilised AST in the context of agile methodologies and organisational change and one study utilised AST when investigating virtual teams which mimics the Covid-19 workplace. For these reasons, AST was chosen.

2.3 Definition of concepts

2.3.1 *Digital transformation*

Digital transformation has piqued the research interest of academics and business practitioners, yet despite the increased levels of research activity, a common perspective of the phenomenon is absent in existing literature (Morakanyane et al, 2017). Osmundsen et al (2018) posited that no clear definition exists of digital transformation. More recent research papers have reflected on the confusion surrounding the concept of digital transformation (Bican & Brem, 2020; Gong & Ribiere, 2021) and thus the absence of a universal definition of digital transformation is still prevalent today.

Hess et al (2016) stated that digital transformation focussed on how digital technologies could transform the business model of a company through altering products and organisational structures or through process automation. Haffke et al (2016) saw digital transformation as the digitisation of a company's products and services which substitute or supplement the physical options available and the digitisation of sales and communication channels enabling innovative approaches to customer experience. In contrast, Henriette et al (2016) positioned digital transformation as a change process that is disruptive or

incremental where initially digital technologies are implemented and “then evolving into an implicit holistic transformation of an organisation, or deliberate to pursue value creation” (p. 2). Morakanyane et al (2017) defined digital transformation as “an evolutionary process that leverages digital capabilities and technologies to enable business models, operational processes and customer experiences to create value” (p. 437). Zaoui and Souissi (2020) viewed digital transformation as a blueprint requiring the reassessing of the interactions between companies, customers and stakeholders and revising the prior perspectives on product and service offerings as “companies undergo multidimensional transformation” (p. 622).

Teichert (2019) viewed the definition of Morakanyane et al (2017) as good but preferred the definition of Henriette et al (2016) as it emphasised the importance of a holistic approach to the transformation of the organisation. Given the researcher’s experience in working in an organisation that is striving to transform digitally, the definitions of Morakanyane et al (2017) and Henriette et al (2016) are adequate but there are critical elements missing that digital transformation needs to focus on such as the people and culture.

Thus, for the purposes of the research, the definition of digital transformation that was adopted is that of Ismail et al (2017) as it combined all the elements of the definitions of Morakanyane et al (2017) and Henriette et al (2016) and specifically included people and culture. The definition is quoted below.

> We define it as the process through which companies converge multiple new digital technologies, enhanced with ubiquitous connectivity, with the intention of reaching superior performance and sustained competitive advantage, by transforming multiple business dimensions, including the business model, the customer experience (comprising digitally enabled products and services) and operations (comprising processes and decision-making), and simultaneously impacting people (including skills

talent and culture) and networks (including the entire value system). (Ismail et al, 2017, p. 6).

2.3.2 *Covid-19*

Covid-19 is an infectious disease that was declared a pandemic by the World Health Organisation on 11 March 2020 (Novelli et al, 2020). Severe acute respiratory distress syndrome coronavirus-2 is the origin of Covid-19 (Mallah et al, 2021) and was first discovered in Wuhan, China in December 2019 (Dey et al, 2020). By 25 February 2021, due to exponential rates of infection, over one hundred and thirteen million cases were reported worldwide with more than two million deaths (Mallah et al, 2021). Many countries enforced lockdowns on their economies restricting activity to essential services to minimise social interaction and thereby restrict the spread of the virus (Caulkins et al, 2021). Social distancing tailored to meet the objectives of individual societal contexts was proposed as a mechanism to allow the easing of lockdowns (Bausch, 2020).

2.3.3 *Remote working*

Remote working enabled by information and communications technology and specifically telecommunications technology was first researched in the 1970's but with technological advances, mobile applications and virtual private networks replaced telecommunications (Davies, 2021). The advent of Covid-19 provided momentum to the adoption of remote working (Anke et al, 2020). Remote working became a strategy for organisations to respond to the requirements of Covid-19 (İlhan, 2021).

A generic definition of work from home is where employees perform their duties in places other than the offices of the company and remote working and telecommuting are used interchangeably to describe work from home (Savić, 2020). There are challenges with conceptualising remote working because the terms used in its definition vary across regions, for example, telecommuting is commonly referred to in the United States and telework is more widely used in

Europe (Aronen, 2017; Klopotek, 2017). These challenges still exist with a recent article by Molino et al (2020) stating that telecommuting and telework are aliases of remote working.

Hardill & Green (2003) defined remote working as any task that transfers and processes information utilising telecommunications and is performed away from the offices of an organisation. Aronen (2017) and Murray (2020) stated that remote working or working from home refers to work that takes place in places other than the sites or offices supplied by employers. This is the definition of remote working that will be adopted by the study as it does not provide any regional bias nor does it link a specific technology to the definition in the manner of the Hardill & Green (2003) definition as it was evident from Davies (2021) that remote working adopts technological innovations over time.

2.3.4 *Agile methodology*

The Agile Manifesto was formulated in 2001 (Cruz et al, 2020) and espouses the following ideals that form the basis of the agile philosophy:

- Individuals and their process of communicating and interfacing with each other are valued more than processes and tools
- Functioning software has a higher worth than extensive documentation
- Working with customers and soliciting customer feedback has more emphasis than questioning and debating contractual obligations
- Implementing a response to change is better than adhering to a plan (Beck et al, 2001).

These ideals or values overarch the principles of agile software development that are defined by the Agile Manifesto (Crişan et al, 2015).

Srivastava et al (2017) stated that “continuous iterations and testing take place during the entire Software Development Life Cycle (SDLC) of a product” (as cited in Garcia et al, 2020, p. 107). Garcia et al (2020) indicated that agile methodologies encompass these activities. Alami (2015) defined agile

methodologies as a set of software development methods where cross functional teams collaborate to find solutions to improvements and changes affecting development.

The above definitions have linked agile methodologies to software development. However, agile methodologies are becoming more popular globally and are migrating into functional departments outside of information technology (Mordi & Schoop, 2020).

Hence defining agile methodologies as being “characterised by adaptive and iterative steps, time for reflection, collaborative decision making and a strong customer focus with frequent feedback loops” (Mordi & Schoop, 2020, p. 2) is more apt as no specific reference is made to software development.

The perspective of Zaitsev et al (2020) that an agile methodology is “characterized by collaborative social interactions and fast-paced and iterative changes in project requirements” (Zaitsev et al, 2020, para. 1) will be adopted for the purposes of the research as it focuses on the social interactions that are at the heart of the main research objective.

There are twelve principles listed in the Agile Manifesto (Haig-Smith & Tanner, 2016) and are presented in Table 2.

Table 2: Agile Manifesto principles (Haig-Smith & Tanner, 2016, p. 123)

Principle #	**Principle**
Principle 1	“Our highest priority is to satisfy the customer through the early and continuous delivery of valuable software.”
Principle 2	“Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.”
Principle 3	“Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.”
Principle 4	“Business people and developers must work together daily

Principle #	Principle
	throughout the project.”
Principle 5	“Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.”
Principle 6	“The most efficient and effective method of conveying information to and within a development team is a face-to-face conversation.”
Principle 7	“Working software is the primary measure of progress.”
Principle 8	“Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.”
Principle 9	“Continuous attention to technical excellence and good design enhances agility.”
Principle 10	“Simplicity — the art of maximizing the amount of work not done — is essential.”
Principle 11	“The best architectures, requirements, and designs emerge from self-organizing teams.”
Principle 12	“At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.”

All previously mentioned agile methodologies generally strive to adhere to the principles of the Agile Manifesto (Dingsør et al, 2012).

2.4 Digital transformation

A systematic literature review was performed by Osmundsen et al (2018) to investigate digital transformation in the organisational context. The goal was to identify the drivers and objectives, success factors and ramifications of digital transformation. It was discovered that organisations face internal and external forces that are the motivation for digital transformation such as changing customer preferences, shifts in the competitive environment and digital trends in the industry. Several success factors were identified inter alia adopting an agile and supportive organisational culture that values change and fosters trust;

collaboration and communication; engaging managers and employees where they are affected by digital transformation; developing information system capabilities that provide a superior transition from analogue to digital offerings; and to align business and information systems. Because of digital transformation, information system functions are becoming a more integral part of the organisation and are expected to be agile to develop digital business solutions to respond to shifting contexts.

Henriette et al (2016) undertook a systematic literature review to understand the concept of digital transformation and to provide clarity on the definition and the dimensions of digital transformation. In addition, an exploratory qualitative study was conducted where semi-structured interviews were held with three senior digital transformation consultants in France to determine what the stakes and implications of digital transformation are. The study highlighted two dimensions of digital transformation i) digital technologies and ii) user experience. The technologies identified were internet, analytics and mobile technologies. User experience was not isolated to customers but included a company's employees as well. For employees, ways of working had changed with collaborative technologies introducing remote working. The themes identified in the exploratory qualitative study were that digital transformation is of strategic importance for companies and it affects the structure and culture of organisations and the information technology function is especially affected.

A study by Ismail et al (2017) was conducted utilising a systematic literature review with the following objectives: i) assess and merge contemporary digital transformation knowledge with a business lens ii) integrate knowledge of the digital transformation strategy process and content iii) place digital transformation in relation to prior technology driven transformations iv) identify the key characteristics that differentiate it. The study found that companies digitally transform because of internal factors such as cost savings, operational efficiency, improved information management and strategic differentiation from market participants and external factors such as cost reductions and improved performance in technology, shifts in industry trends and changing customer

preferences. New technologies play an essential role in initiating digital transformation because they shape markets and disrupt industries. Furthermore, companies are integrating digital technologies in operations processes and decision making and workplaces are more flexible and virtual offices are increasing knowledge sharing.

2.4.1 *Covid-19 and digital transformation in the context of remote working*

The extraordinary effects that the coronavirus pandemic had in introducing the sudden requirement for employees to work from home and the consequent drive to digitally transform the workforce was investigated by Savić (2020). Prior to the outbreak of the pandemic, organisations had intermittently practiced work from home. However, in order to reduce the spread of the virus, governments globally compelled employers to close and allow employees to work from home and thus work from home became mandatory. The study mentioned that telecommuting and remote work were terms used as synonyms when referring to work from home. However, the study made the distinction between the two in that remote work infers that an employee does not reside in the same locale as the organisation's main offices. Despite this distinction, they have the same negative aspects in that employees' sense of isolation poses sociological and psychological challenges and there is a lack of boundaries between work and personal life. The study found that organisations have been forced to shift to work from home practices necessitating an upgrade of their long distance collaboration capabilities such as video conferencing, collaboration platforms and video streaming. This has resulted in the virtual transformation of many IT enabled processes and the replacement of traditional work practices and the digital transformation of the workforce.

Soto-Acosta (2020) investigated the effect of Covid-19 on digital transformation as well as the converse and specifically on how Covid-19 is accelerating the digital transformation of organisations. The findings indicated that social distancing and lockdown are compelling the remote execution of jobs. Despite

the availability of digital technologies that enabled teleworking prior to the pandemic, it was the pandemic that drove the increase in adoption and implementation of these technologies and the proliferation of digital transformation projects in companies willing to embrace remote working. In addition, the growth and improvements in collaborative digital technologies facilitated real time collaboration and knowledge sharing between customers, business partners and suppliers transforming traditional business activities into digital ones.

An opinion paper written by Papagiannidis et al (2020) reflected on what challenges the Covid-19 pandemic posed to IT from the perspective of IT professionals. The response of IT managers had to be swift to respond to the crisis created by the pandemic and ensure business continuity through innovative solutions utilising information and communication technologies. Certain challenges could not be resolved with technology alone as for example teleworking also required human resource management elements to be addressed. Other concerns were providing new digital communication channels, enabling users to work remotely and privacy and security issues.

2.4.2 *Agile methodology in the context of Covid-19 and remote working influences*

A component of the literature review was a search for academic papers discussing the effect of digital transformation on the agile methodology which only yielded a single paper by Gerster (2017) that dealt with the topic.

Gerster (2017) undertook a bibliometric study and analysed 2,833 articles published in the period January 2007 to December 2016 to understand the priority of research on the effect of digital transformation on IT for mainstream information systems (IS) research, as it was deemed rare. The study found that digital transformation has a major effect on IT. Agile is viewed by practitioners as a general concept to increase the responsiveness of IT. Of the 2,833 articles analysed, only five articles were found to be relevant in discussing the effect of digital transformation on IT. The relevant articles discussed agility, innovation

and organisational change management and ambidexterity and the effect of digital transformation on these topics but did not investigate how digital transformation in the context of remote work and virtual offices would affect the values and principles of agile methodologies. The study concluded that future topics of research would be what bearing digital transformation would have on existing IS theories. Because agile methodologies are becoming mainstream in IT departments, the future research would apply to the agile methodologies.

The primary focus of the literature review was to identify research papers that dealt with Covid-19 and agile and with remote work and agile. This focus was confirmed as it was clear from the literature review of digital transformation that remote working and the virtualisation of offices are integral aspects of digital transformation. The research indicated that Covid-19 has definitely had an influence on digital transformation and specifically the digital transformation of the workforce through remote working. Although Covid-19 can be said to have influenced the agile methodology, this influence could only be manifested through digital transformation and its integral feature – remote working.

Zoła (2014) investigated the problems associated when remote working is used together with the scrum methodology in project teams. A case study was completed of a project that was delivered by a scrum team that was geographically dispersed across the United Kingdom, United States, Poland and South Africa. The findings indicated that there were issues with collaboration, alignment of communication was a challenge with questions not being answered quickly, disruptions at home, separation of private and professional life and critically, team integration. In designing the scrum process and workflow, the company addressed as many of the issues as possible utilising tools, policies and procedures. Calendar sharing, project management software, instant messaging applications and video conferencing were tools that were leveraged. Feedback from sprint retrospectives could lead to changes in the company's policies and procedures. Meetings were recorded if participants could not attend. The company also had fixed hours of work for employees and

allowed a modicum of flexibility. To foster integration the employees did meet informally.

Mancl and Fraser (2020) based their paper on a panel that debated how Covid-19 had affected knowledge workers, fast-tracked the digital transformation of the workplace and what the future effects would be on agile practices. The four main conclusions drawn by the panellists were the following: i) there is an assortment of online collaboration tools which enable virtual collaboration and the replacement of face-to-face interaction ii) adhering to the values and principles of agile is more difficult due to meetings and interactions occurring digitally iii) brainstorming and side discussions are not completely catered for by communication tools iv) the creation of new teams and the onboarding of new employees is difficult when done virtually. The panellists also mentioned several other issues such as the friction between team members is amplified when working from home, long term consequences of erosion of trust between team members working from home and attaining work-life balance.

2.5 Conclusion of literature review

Digital transformation is triggered by emerging technologies and is propelled by internal factors such as cost savings, operational efficiency gains, improved information management and strategic differentiation from market participants; and external factors such as technology cost reductions, improved technology performance, shifts in industry trends, changing customer preferences and new technology products and services (Ismail et al, 2017). One dimension of digital transformation is user experience where collaborative technologies are introducing remote work (Henriette et al, 2016) and where the effect on the human elements of a firm's value chain is in the digital transformation of the workplace (Ismail et al, 2017). These aspects of digital transformation will have a major effect on the information system functions of an organisation (Osmundsen et al, 2018) and by extension will have a definite influence on the agile methodologies that IT departments are adopting through the introduction of remote working.

Covid-19 has forced organisations to shift to work from home practices necessitating an upgrade of their long distance collaboration capabilities such as video conferencing, collaboration platforms and video streaming (Savić, 2020). The pandemic has seen an increase in the adoption and implementation of digital technologies enabling teleworking and the proliferation of digital transformation projects in companies to transform the workplace (Soto-Acosta, 2020). This has driven the move from the analogue version of face-to-face communication to the digitally transformed environment of virtual meetings and remote working and the agile methodologies were not immune to this development.

Very little has been investigated in literature regarding the influence of digital transformation on agile methodologies. However, it was evident that remote working is an integral aspect of digital transformation (Henriette et al, 2016; Ismail et al, 2017).

There are issues that remote working poses to agile methodologies including scrum (Zoła, 2014). Although these challenges were experienced by a geographically dispersed team, these challenges would equally be faced by a team working remotely in the same city. Covid-19 also has had an influence on the agile methodologies and long term consequences are yet to be understood (Mancl & Fraser, 2020).

The literature review has provided evidence that Covid-19 has had an influence on remote working and that remote working has had an influence on the agile methodology.

- The primary objective of the research is to identify how Covid-19 and remote working have influenced the agile methodology of a South African bank.
- The secondary objectives are to identify how Covid-19 has influenced remote working, how remote working has influenced the agile methodology and how Principle 6 of the Agile Manifesto has been influenced.

Table 3: Summarised consistency table: Research questions and propositions

RQ #	Research Question	Proposition
1	How has Covid-19 and remote working influenced the agile methodology?	
1.1	How has Covid-19 influenced remote working?	Digital transformation in the bank would be accelerated through remote working and virtualisation of offices. However, employees would feel isolated and be unable to establish boundaries between work and personal life.
1.2	How has remote working influenced the agile methodology?	The productivity of the agile methodology would be challenged by issues with collaboration, team integration and the difficulty to adhere to the agile values and principles.
1.3	How has Principle 6 of the Agile Manifesto been influenced?	Virtual interaction would have a negative influence on Principle 6.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter will discuss the research methodology. It provides an overview of the research approach, the research design, the data collection methods and the population that is addressed by the research and how a sample of that population was sourced. The research instrument that was utilised to collect the research data will be described together with how the data was analysed.

3.2 Research approach

Since Covid-19 is a recent pandemic, and the literature review exposed the paucity of research on the influence of digital transformation on agile methodologies, it was clear that the research topic is quite novel. Qualitative research is suited to scenarios where a research topic is novel and there is no clarity on which variables to investigate (Creswell & Creswell, 2018) and it allows for the discovery of variables that are pertinent and can be tested through future quantitative research (Corbin & Strauss, 2015).

The purpose of the study was to explore the influence that the enforced remote working introduced by Covid-19 had on the agile software development processes of a South African bank. The fact that a study is exploratory is one of the primary motives for undertaking a qualitative study (Creswell & Creswell, 2018).

From the preceding discussions, it is clear that Covid-19, remote working and agile methodologies affect both technological and business facets in an organisation and the influences of Covd-19 and remote working are real world challenges for organisations. To gain a deeper understanding of technology and business issues, in-depth studies in the natural environment are required to analyse and evaluate the phenomena and for this reason qualitative research is

utilised more frequently as the research approach (Basias & Pollalis, 2018). Qualitative research is also focussed on providing deep insights and comprehending challenges influencing the real world (Carminati, 2018; Moser & Korstjens, 2017).

For the abovementioned reasons, a qualitative approach was adopted.

3.3 Research design

Case studies provide a scientific basis for in-depth investigations into real world phenomena within their natural environment and are well suited to assist in understanding how things happen and why they happen (Ridder, 2017).

Because of the novelty of Covid-19 and the low volume of research on the influence of remote working on agile methodologies the inference can be made that the research topic of the study is in its infancy in the context of academic research. Case studies are well suited to instances where research on a particular topic is in its early stages and furthermore, case studies can be based on organisations (Mfinanga et al, 2019).

The objective of the research was to identify how Covid-19 and remote working have influenced the agile methodology of a South African bank. A case study research design is thus appropriate as the focus of the research is a single organisation, the research topic is in its infancy and the research objective is to explore the how of the phenomenon.

The advantages of case studies are the following: i) enabling new hypotheses to be created in the natural environment of the phenomena being studied ii) facilitating comprehension of complex and contemporary real-life scenarios iii) are beneficial when the researcher cannot control events (Krusenvik, 2016). These advantages are applicable to the research as the influence of Covid-19 and remote working on agile methodologies is a recent development and is a lived experience over which the affected parties of the phenomenon have no control over.

The greatest criticisms of case studies are the lack of scientific generalisability due to the high specificity that can only relate to a particular context and the lack of rigor because of the high level of influence the researcher can have on the results due to the researcher's close involvement and bias (Krusenvik, 2016). These concerns are applicable to the research as this is a case study based on a single organisation and may well not apply to other banks, let alone organisations outside the financial services industry. In addition, the researcher does have prior knowledge and experience of digital transformation and agile methodologies and the researcher might subconsciously lead the research in the direction of a preconceived result.

3.4 Population and sample

3.4.1 *Population*

The population for the research was any employee that worked in the retail banking unit of the bank on agile projects. These individuals were all involved with or part of the agile teams that deliver projects according to the scrum methodology in the bank. This population numbered in the hundreds. These individuals would be able to provide insights and perspectives on how Covid-19 and remote working had influenced the agile methodology as they would have been directly affected and would have had to implement any changes necessitated by this influence.

3.4.2 *Sample and sampling method*

The sample method utilised was purposive sampling. This is a non-probability sampling method also known as judgement sampling where the knowledge and comprehension of the researcher is used to select the sample from a population (Etikan & Babatope, 2019). It is a non-random method where the sample selected is from individuals that have first-hand knowledge of the phenomenon (Etikan et al, 2016). This correlates with the view of Ridder (2017) that non-random sampling is typical for a case study.

Data saturation is reached when new incoming data produces superfluous information that has already been identified (Moser & Korstjens, 2018). Twelve interviews are typically required to attain higher degrees of saturation (Guest et al, 2020). Mostly, it is the researcher that will establish when data saturation is reached (Moser & Korstjens, 2018; Guest et al, 2020).

Thus, thirteen individual semi-structured interviews were required to ensure that data saturation was reached.

Of the thirteen interviews, five of these were with executive and senior managers and eight with members of the agile teams in order to secure a spread of perspectives.

The sampling frame focused on the management of the agile teams and the teams responsible for the agile projects. Key individuals that were targeted included a chief information officer (CIO), a development manager, a portfolio manager and the business executive for whom the agile teams delivered.

At least one interview with each role in the agile team i.e. product owner, scrum master and development team was required.

Table 4: Profile of respondents

Respondent Type	Number to be sampled
CIO	1
Portfolio manager	1
Development manager	1
Programme manager	1
Business executive	1
Scrum master	1
Product owner	1

Developer (Development team)	2
Business Analyst (Development team)	1
Solution Analyst (Development team)	1
Tester (Development team)	1

3.5 The research instrument

A semi-structured interview schedule was utilised to conduct the interviews and elicit responses from the participants. The interview consisted of three sections. Sections B to D comprised open-ended questions to elicit participants' perspectives.

Section A covered biographic information of the participants.

Section B explored how Covid-19 had influenced remote working in the bank.

Section C explored how remote working had influenced the agile methodology in the bank.

Section D explored how remote working had influenced Principle 6 of the Agile Manifesto.

The research instrument can be found in Appendix A.

3.6 Procedure for data collection

Prior to commencement of data collection, approval was received from the bank to conduct the research. In the approval motivation, the bank was apprised of the purpose of the study, the profile of required participants and the value of the study to the bank.

Data collection was facilitated through semi-structured interviews conducted with research participants. Semi-structured interviews allow for open ended collection of new data in the exploration of the personal experiences and

attitudes of respondents towards a research topic (DeJonckheere & Vaughn, 2019). As mentioned previously, the influence of Covid-19 and remote working on the agile methodology is a recent development and is a lived experience for affected parties. Therefore, semi-structured interviews were considered to be a suitable data collection method for the research topic especially in pursuit of a deeper understanding of how Covid-19 and remote working have influenced the agile methodology of the South African bank in question. Semi-structured interviews enabled this deeper understanding as pre-defined questions could be explored in greater depth through follow up questions as additional information unearthed could be probed further and connections between concepts surfaced could be analysed (Queirós et al, 2017). This also allowed for new perspectives to be uncovered further supplementing the understanding of the phenomenon.

An important additional advantage is that the presence of an interviewer ensures that there is a mutual understanding of questions enabling better answers and thus more accurate data (Alshenqeeti, 2014).

The semi-structured interviews were conducted virtually to comply with the social distancing requirements of the Covid-19 restrictions. The virtual interviews were recorded for later review and analysis.

The data collection process comprised the following steps:

i. Each identified participant was called to provide them with the context of the study and to outline the purpose of the study.
ii. The participants were requested to take part in the interview.
iii. An interview was set up with every participant who agreed to be interviewed.
iv. The interview questions were sent to the participants before the interview so that they could acquaint themselves with the questions and could comfortably answer them.
v. Permission for the recording of the interviews was obtained to meet privacy requirements.
vi. The interviews were conducted following the interview schedule.

vii. Each interview was transcribed and emailed to the respective participant to confirm that the transcription was a correct reflection of the interview.

3.7 Data analysis and interpretation

Thematic analysis is a method to detect, analyse and describe the underlying patterns and themes that exist in data (Braun & Clark, 2006). The method is relatively easy to absorb for novice researchers but it is powerful in interpreting and extracting insights from data and provides flexibility in terms of the type of research questions it can be applied to (Kiger & Varpio, 2020). A further advantage of thematic analysis is that it is not bound to a specific epistemological or theoretical viewpoint (Maguire & Delahunt, 2017). For these reasons, thematic analysis was used to analyse the data collected.

The thematic analysis framework proposed by Braun and Clark in 2006 has been extensively adopted in applied research areas (Clark & Braun, 2018) and Maguire and Delahunt (2017) opined that the framework was easy to understand and use. Thus, the six step process of thematic analysis as outlined by Braun and Clark (2006) was followed.

Figure 1: Thematic analysis process

3.7.1 *Step 1: Data familiarisation*

Immersion in the data is critical for the researcher to be conversant with the scope of the content (Braun & Clark, 2006) and is the foundation of the process providing perspective on the raw data (Kiger & Varpio, 2020). To become acquainted with the data to this level, the researcher read the interview transcripts multiple times and made note of impressions and ideas.

3.7.2 *Step 2: Initial code generation*

The process of generating initial codes is used to extract smaller units of meaning from large amounts of data (Maguire & Delahunt, 2017) in order to surface the underlying themes in the data (Williams & Moser, 2019). Codes represent these smaller units of meaning and define “the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon” (Boyatzis, 1998, p. 63).

The purpose of the study was to answer the specific research questions posed. This intent infers the use of a theoretical thematic analysis (Maguire & Delahunt, 2017) which is generally motivated by the researcher’s analytical focus on the research question (Braun & Clark, 2006). Therefore, the researcher examined each transcript and coded every text extract that appeared to have a bearing on or encapsulated something material about the research questions. All text extracts associated to a code were collated and linked to the code in Microsoft Excel using a table.

3.7.3 *Step 3: Theme identification*

According to Maguire and Delahunt (2017), “a theme is a pattern that captures something significant or interesting about the data and/or research question” (p. 3356) and “is characterised by its significance” (p.3356). The identification of themes entails classifying the generated codes into potential themes by determining whether various codes can be collated to construct an overarching theme (Braun & Clark, 2006). Once the researcher had analysed all the codes in the search for themes, all codes categorised into a theme were collated and linked to the theme in Microsoft Excel using a table. Because the associated text extracts were linked to a code in Microsoft Excel previously, through the functionality of Microsoft Excel, all text extracts linked to codes categorised into a theme, were also now linked to that theme. A semantic approach to search for themes was adopted and therefore “… the themes are identified within the explicit or surface meanings of the data and the analyst is not looking for

anything beyond what a participant has said or what has been written." (Braun & Clark, 2006, p. 84).

3.7.4 *Step 4: Theme review*

To review the themes, the researcher examined all the text extracts that were classified into each theme to establish if they followed a coherent pattern as per Braun and Clark (2006) and if the text extracts supported the theme (Maguire & Delahunt, 2017). A coherent pattern displays internal homogeneity when the codes are associated in a meaningful way within a theme and external heterogeneity when themes can be distinguished clearly from each other (Braun & Clark, 2006; Chen et al, 2018). Mind maps were used to determine if the relationships between codes, sub-themes and themes made sense. The end result of this process was a thematic map where the themes were justifiable in the context of the data, and that "reflects the meanings evident in the data set as a whole" (Braun & Clark, 2006, p. 91).

3.7.5 *Step 5: Theme definition*

In this step, final refined versions of the themes were produced by "identifying the 'essence' of what each theme is about" (Braun & Clark, 2006, p. 92). Various sub-themes emerged from this process. Microsoft Excel was used to create the link between the identified sub-themes and their parent themes. Because the functionality of Microsoft Excel enabled the link (prior to demotion) between the sub-theme and its collated codes and the link between the collated codes and their associated text extracts to be maintained, the link between the parent theme down to the text extracts, through the sub-themes and collated codes, was automatically established.

3.7.6 *Step 6: Report writing*

All the effort of the preceding steps culminated in the final analysis and exposition of the findings, produced in the form of a report, with the express

purpose of assuring the reader of the merit of the analysis and that it was well grounded (Braun & Clark, 2006).

3.8 Trustworthiness

The generally accepted criteria to determine whether research findings are trustworthy and worthy of paying heed to are transferability, credibility and dependability (Lincoln & Guba, 1985, as cited in Nowell et al, 2017; Amankwaa, 2016; Elo et al, 2014).

3.8.1 *Transferability*

Transferability is the extent to which the findings of research are applicable to other contexts or settings taking into account the context of the research (Coy, 2019) where the onus is on the reader to make the transferability judgement since their unique context is not known (Korstjens & Moser, 2018). It is the responsibility of the researcher to enable the transferability judgement by readers through providing detailed contextual descriptions including the research process (Anney, 2014; Korstjens & Moser, 2018). Anney (2014) also indicated that a researcher should apply purposive sampling as it provides greater insights in the enablement of the transferability judgement. The context of the research encompassing Covid-19, remote working and agile methodologies was expected to have similar themes in other contexts by virtue of their characteristics. Thus, every effort was made to ensure that there were detailed contextual descriptions of the experiences of participants and the research processes employed, in the event that the expectation turned out to be incorrect. This coupled with the use of purposive sampling ensured a relatively high degree of transferability.

3.8.2 *Credibility*

Credibility is a measure of the assurance that can placed in the truthfulness of research conclusions and it confirms whether the research conclusions are

probable information derived from the original data collected from participants and that the participants' original perspectives were accurately interpreted (Anney, 2014; Korstjens & Moser, 2018). Two strategies were used to ensure credibility. The first strategy employed was peer debriefing where the perspectives and advice of other researchers and students was garnered to improve the quality of the research conclusions (Anney, 2014) and specifically the input of the researcher's supervisor was crucial in ensuring credibility. The second strategy was member checks where the interview transcripts, interpretations and research conclusions were shared with participants to enable a check and challenge of the research outputs (Anney, 2014; Korstjens & Moser, 2018).

3.8.3 *Dependability*

Dependability refers to the repeatability of research findings if the study was repeated in an equivalent setting involving the same or comparable participants (Bitsch, 2005). An audit trail provides comfort in the dependability of a study (Anney, 2014). All artefacts produced by the research were meticulously kept and documented to ensure dependability of the study. The fact that the virtual interviews were recorded and stored ensured the transparency of the raw data.

3.9 Limitations of the study

i. The insights generated by the research will not be generalisable as a case study was the research approach with the focus on one organisation.
ii. The context of the organisation is possibly not replicable across similar organisations in the same industry or in different industries.
iii. Due to the virtual nature of the interviews, body language and general attitude of participants was difficult to gauge.
iv. The depth and breadth of information elicited from participants depends on the probative skill of the researcher as well as the inclination of

participants to divulge information. Participants might not have shared all aspects of their perspective despite the probing of the researcher.

v. The prior knowledge that the researcher has regarding digital transformation and agile methodologies could introduce a bias in how the researcher conducts the interviews or interprets the data.

3.10 Ethical considerations

The following ethical aspects were addressed:

i. All ethical policies and procedures required by the University were followed scrupulously.
ii. The approval of the bank was obtained for the employees to participate in the study.
iii. Data was only collected once the University had provided clearance and the bank had provided approval.
iv. Consent was obtained from the participants before they were interviewed.
v. The identity of the bank and the participants has not been disclosed.
vi. The personal information of participants was not collected.
vii. Confidential organisational information has not been disclosed.

CHAPTER 4. PRESENTATION OF FINDINGS

4.1 Introduction

This chapter will present the findings of the qualitative research conducted. The participant demographics will be presented first, followed by the themes and sub-themes emerging from the insights provided by the participants and finally a summary of the findings. The thematic analysis process discussed in Section 3.7 was applied in the analysis of the data. The findings are discussed corresponding to the propositions put forward in Chapter 2.

4.2 Participant demographics

The thirteen participants conform to the respondent profile defined by the purposeful sampling approach. The demographic information of the participants is presented in this section. The participants are referred to as P1, P2, P3, etc to meet the ethical obligations of maintaining the anonymity of the participants.

In Table 5 below it can be observed that male participants represent the majority of participants and that participants were predominantly white, but this does not impact the findings of the study. The average tenure of participants is 9.5 years and the average agile experience of participants is 6.5 years. The majority of participants had a tertiary qualification but not an agile certification.

Table 5: Demographic profile of participants

Part. #	Role	Gender	Race	Education Level	Tenure (years)	Agile Exper. (years)	Agile Cert.
P1	Business analyst	Male	White	Degree	3	5	N
P2	CIO	Male	Indian	PhD	6	17	Y
P3	Developer	Male	White	Degree	6	12	N

Part. #	Role	Gender	Race	Education Level	Tenure (years)	Agile Exper. (years)	Agile Cert.
P4	Portfolio manager	Male	White	Diploma	7	3	N
P5	Developer	Female	African	Matric	2.5	2.5	N
P6	Development manager	Male	White	Diploma	7	7	N
P7	Product owner	Female	White	Advanced Diploma	18	4	N
P8	Scrum master	Male	White	Diploma	27	6	Y
P9	Solution analyst	Male	White	Degree	3	10	Y
P10	Business executive	Female	White	Degree	13	4	N
P11	Scrum master	Female	White	Matric	15	6	Y
P12	Tester	Female	Indian	Degree	4	3	N
P13	Program manager	Male	Indian	Degree	11	7	Y

4.3 Data analysis

Semi-structured interviews were utilised to collect the required data in order to meet the objectives of the study. The purpose of data analysis and interpretation is to identify patterns in the data, determining what these patterns mean and establishing their significance and implications. The thematic analysis process was employed as discussed in Section 3.7.

Data was transformed into text format in order to perform the analysis. Subsequent to this, initial impressions of the data were formulated based on the research questions and are summarised below. During the data analysis process, a conscious and intentional effort was made to avoid any

misinterpretation of the participants' perspectives and opinions because of the researcher's bias.

4.3.1 *Initial code generation*

The initial codes were generated by the researcher reading every transcript and coding every extract that seemed relevant to the research questions to determine emerging themes. Open coding was utilised and thus there were no pre-determined codes. Since the coding was performed with a focus on the research questions, a theoretical approach was followed.

Seventy one codes were identified in the coding process which included several similarities. These initial codes questions were grouped into a single table to aid analysis and can be found in Figure 2.

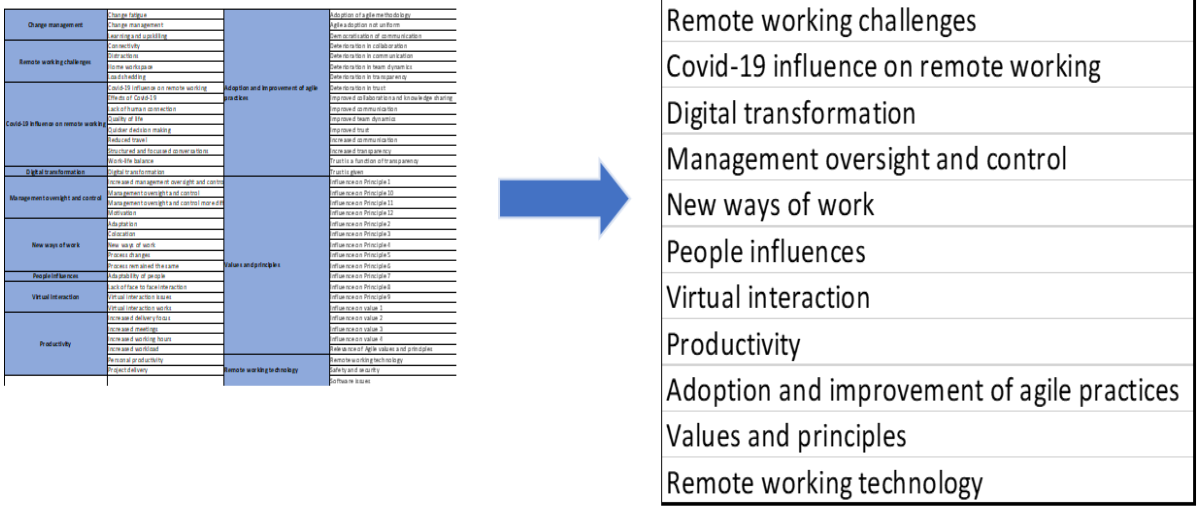
Figure 2: Initial codes

Change management	Change fatigue		Adoption of agile methodology
	Change management		Agile adoption not uniform
	Learning and upskilling		Democratisation of communication
Remote working challenges	Connectivity		Deterioration in collaboration
	Distractions		Deterioration in communication
	Home workspace		Deterioration in team dynamics
	Load shedding		Deterioration in transparency
Covid-19 influence on remote working	Covid-19 influence on remote working	**Adoption and improvement of agile practices**	Deterioration in trust
	Effects of Covid-19		Improved collaboration and knowledge sharing
	Lack of human connection		Improved communication
	Quality of life		Improved team dynamics
	Quicker decision making		Improved trust
	Reduced travel		Increased communication
	Structured and focussed conversations		Increased transparency
	Work-life balance		Trust is a function of transparency
Digital transformation	Digital transformation		Trust is given
Management oversight and control	Increased management oversight and contro		Influence on Principle 1
	Management oversight and control		Influence on Principle 10
	Management oversight and control more diff		Influence on Principle 11
	Motivation		Influence on Principle 12
New ways of work	Adaptation		Influence on Principle 2
	Colocation		Influence on Principle 3
	New ways of work		Influence on Principle 4
	Process changes		Influence on Principle 5
	Process remained the same	**Values and principles**	Influence on Principle 6
People influences	Adaptability of people		Influence on Principle 7
Virtual interaction	Lack of face to face interaction		Influence on Principle 8
	Virtual interaction issues		Influence on Principle 9
	Virtual interaction works		Influence on value 1
Productivity	Increased delivery focus		Influence on value 2
	Increased meetings		Influence on value 3
	Increased working hours		Influence on value 4
	Increased workload		Relevance of Agile values and principles
	Personal productivity		Remote working technology
	Project delivery	**Remote working technology**	Safety and security
			Software issues

The codes were classified into twelve categories which are depicted in Figure 3 below: Change management, remote working challenges, Covid-19 influence on remote working, digital transformation, management oversight and control,

new ways of work, people influences, virtual interaction, productivity, adoption and improvement of agile practices, values and principles and remote working technology.

Figure 3: Initial codes to categories



4.3.2 *Theme identification and final refinement*

The grouping of similar codes into categories followed the generation of the initial codes and in some cases, the emerging patterns resulted in sub-categories being defined. It was ensured that the themes identified were associated with the three main research questions.The twelve categories were refined further into four major themes and their associated sub-themes and mapped back to the research questions. Figure 4 below depicts how the refinement of the twelve categories resulted in the four major themes and their associated sub-themes.

The four major themes are:

- Adaptation
- Covid-19 influence on remote working
- Remote working influence on agile methodology
- Remote working challenges.

Figure 4: Final themes and sub-themes

Category	Code	Theme	Sub-theme	Category	Code	Theme	Sub-theme
Change management	Change fatigue	Adaptation	Change management Learning and upskilling	Adoption and improvement of agile practices	Adoption of agile methodology	Remote working influence on agile methodology	Adoption and improvement of agile practices Communication and collaboration Trust and transparency Team dynamics
	Change management				Agile adoption not uniform		
	Learning and upskilling				Democratisation of communication		
Remote working challenges	Connectivity	Remote working challenges	Connectivity and loadshedding Home Workspace		Deterioration in collaboration		
	Distractions				Deterioration in communication		
	Home workspace				Deterioration in team dynamics		
	Load shedding				Deterioration in transparency		
Covid-19 influence on remote working	Covid-19 influence on remote working	Covid-19 influence on remote working	Emotional and physical effects of Covid-19 Lack of human connection Quality of life		Deterioration in trust		
	Effects of Covid-19				Improved collaboration and knowledge sharing		
	Lack of human connection				Improved communication		
	Quality of life				Improved team dynamics		
	Quicker decision making				Improved trust		
	Reduced travel				Increased communication		
	Structured and focussed conversations				Increased transparency		
	Work-life balance				Trust is a function of transparency		
Digital transformation	Digital transformation	Covid-19 influence on remote working	Digital transformation		Trust is given		
Management oversight and control	Increased management oversight and contro	Remote working influence on agile methodology	Management oversight and control	Values and principles	Influence on Principle 1	Remote working influence on agile methodology	Values and principles
	Management oversight and control				Influence on Principle 10		
	Management oversight and control more diff				Influence on Principle 11		
	Motivation				Influence on Principle 12		
New ways of work	Adaptation	Adaptation	New ways of work		Influence on Principle 2		
	Colocation				Influence on Principle 3		
	New ways of work				Influence on Principle 4		
	Process changes				Influence on Principle 5		
	Process remained the same				Influence on Principle 6		
People influences	Adaptability of people	Adaptation	Adaptability of people		Influence on Principle 7		
Virtual interaction	Lack of face to face interaction	Remote working influence on agile methodology	Virtual interaction		Influence on Principle 8		
	Virtual interaction issues				Influence on Principle 9		
	Virtual interaction works				Influence on value 1		
Productivity	Increased delivery focus	Remote working influence on agile methodology	Productivity		Influence on value 2		
	Increased meetings				Influence on value 3		
	Increased working hours				Influence on value 4		
	Increased workload				Relevance of Agile values and principles		
	Personal productivity			Remote working technology	Remote working technology	Adaptation	Remote working technology
	Project delivery				Safety and security		
					Software issues		

4.4 Thematic map produced by thematic analysis

The thematic map formed by the final refinement of the themes is shown in Figure 5. Major themes and their sub-themes that describe the influence of Covid-19 and remote working on the agile methodology in the bank are indicated on the thematic map. The major themes identified are Adaptation, Covid-19 influence on remote working, Remote working influence on agile methodology and Remote working challenges for the agile methodology. An explanation of the major themes and their sub-themes will be provided in this section.

Figure 5: Thematic map

4.5 Adaptation

The major theme, Adaptation, speaks to the capability of employees to adopt and assimilate changes that are introduced into their work environment and describes what these changes were. Covid-19 influenced remote working which in turn influenced the agile methodology of the bank, necessitating employees to integrate these influences or changes into their work life and routine. Adaptation was found to encompass five sub-themes namely: Adaptability of people; Remote working tools; New ways of work, Change management and Learning and upskilling.

4.5.1 *Adaptability of people*

Adaptability is a key ability of employees to make sense of new changes that influence their personal and work circumstances and to adopt and assimilate these changes in a manner that does not negatively affect their personal and work life. Covid-19 and remote working introduced new tools that employees had to integrate into their daily work activities thus introducing new ways of work for the agile methodology and the broader organisational processes of the bank. A vast majority of participants mentioned how employees had adapted to this new work environment that resulted from Covid-19 and remote working and were actually thriving.

However, several participants alluded to the fact that not all employees were able to adapt and thrive in the new environment and that there were employees who were challenged in this regard. For those employees that were challenged, there was a detrimental effect on their performance.

Quotes:

Participant 2: “And from a people side of things I think the adaptability played a key. You either were adaptable or you are not, you were either an adopter bleeding edge or not. And I think the majority of the people that we had within the environment, particularly in the project program management spaces were easy adopters of the new ways of work.”

Participant 4: “So from a people point of view, and there to depends on the individual, some people can work on their own without supervision others can’t.”

Participant 5: “On people it was mostly on adaptability of the new ways of work and also learning to use the resources that were implemented for remote working.”

Participant 6: “… you have those resources that is absolutely working brilliantly from home, but you also have the opposite, guys that struggle to work from home and can't really commit to what they need to do there.”

Participant 7: “So I think in terms of people, like I said, some people this environment they thrive in and actually, producing more and in others, it's not.”

4.5.2 *Remote working technology*

One of the major changes that employees had to adapt to was the implementation of technology that enabled remote working which was driven by Covid-19. This was required to enable employees to connect with the bank and communicate and collaborate with colleagues remotely, since the bank had made the decision that non-customer facing staff would work from home. All the participants highlighted the fact that the remote working technologies implemented were integrated into their daily work activities.

These remote technologies solved for the safety and security of employees, the cybersecurity of the bank and the enabling of remote communication and collaboration. In terms of security, a technology called Z-scaler was implemented that enabled employees to connect remotely and securely to the bank’s systems and work in the safety of their homes. This in turn provided additional safeguards for the bank against any cybersecurity incursions. Remote communication was facilitated by Microsoft Teams and all meetings and calls were handled on this platform. Miro was the technology of choice for enabling remote collaboration and was used to house the projects’ Kanban boards and tasks of the project team members.

Other remote technologies mentioned were Zoom (communication), Forticlient (remote connection) and JIRA (collaboration). Whatsapp was also mentioned as a mechanism that was used to communicate with colleagues.

Quotes:

Participant 2: “And I think the reason for Z scaler was moving towards a zero trust environment when it comes to security because of people working remotely, you needed to treat everything as a risk when it came to cybersecurity…”

Participant 6: “On the actual technology, I'd say yes, there was a massive improvement in technology, the push that had to get in place to make sure that you can clearly communicate, you can connect, securely.”

Participant 7: “And in terms of the technologies within our space we've started using a lot of different technologies we didn't use before and the obvious one is Teams, but we also started using like Miro boards and stuff like that to try and collaborate better.”

Participant 12: “So, for example, we're using Microsoft Teams and now it's become the core of everything. So for messages and calls everything is on Teams now.”

4.5.3 *New ways of work*

The introduction of remote working technologies such as Microsoft Teams and Miro necessitated the integration of these technologies into the daily activities of employees. This introduced new ways of work which is the other major change that employees had to adapt to especially with the move to virtual interaction from physical face-to-face interaction. Introducing new technology into existing processes does not necessarily alter the process as the process steps are still followed albeit utilising the advantages offered by the new technology. This is one aspect of new ways of work where processes are not changed, but rather executed with different tools and the opportunities they offer. The other aspect of new ways of work relates to when processes are altered. Perspectives on new ways of work were provided by all the participants.

The vast majority of participants stated that new ways of work were introduced because of the integration of the remote working technology into work activities. A number of participants raised the fact that this integration enabled teams to be geographically dispersed and that co-location was no longer essential. One participant mentioned that governance processes were being refined. On the other hand, several participants stated that the agile process steps remained unchanged.

Quotes:

Participant 1: “And that just shows you how many people basically have had to just adapt to technology and work it into their daily activities.”

Participant 5: “In terms of processes, most processes have stayed more or less the same because of we just changed the way you have to work, but then it doesn't change at the end of the day, the process of getting work done.”

Participant 6: “One person can sit in Cape town, one person can sit in Johannesburg and you can still get the same effectiveness as if they sitting next to each other.”

Participant 9: “This needs to happen with let's say the PIA team or data migration team, you would need to set up a session individually for each of those. Now it's simply actually just starting a group chat asking all the questions you want roping in all the key role players and it's more visible for everyone.”

Participant 10: “So I think one of the key changes that we making currently, which I do think is a change of process is around the governance., getting products in, projects in, changes in, where we trying to refine that process, where it takes six months to get a product in. We try to get that into three months, so changing the governance process.”

4.5.4 *Change management*

Introducing new ways of work requires change management to prepare employees so that they can successfully adapt to the changes. As mentioned previously, not all employees were able to adapt and thrive in the new environment of remote working. Several participants mentioned the change management initiatives that the bank had initiated to prepare employees for the new ways of work. These initiatives were geared towards ensuring that employees could successfully incorporate the new ways of work into their personal and work lives.

Two participants raised the issue of change fatigue. New technologies are tested and discarded if they don't meet the needs of the bank. This creates the impression of continuous change where employees are expected to adapt and adjust.

Quotes:

Participant 1: "So there's quite a few significant initiatives that are quite noticeable xxx dojo, discipline campaign and stuff like that that basically shares a set of behaviours and enable our teams to build trust, increasing performance and adopt or adapt a digital mindset."

Participant 1: "… things happen too quickly from a technological perspective that, people have to basically meet that demand and that can create a lot of fatigue."

Participant 8: "xxx has started a whole process of the ten dojo disciplines. Know your team listen, et cetera, et cetera."

Participant 11: "They've also provided a ways of working booklet where they guide you of what you can do, doing the exercises, how you could balance your work life days, opening the communication with your teams, et cetera."

Participant 11: "And basically one of the biggest things is we are in a continuous change mode, where we adapt and adjust."

4.5.5 *Learning and upskilling*

This refers to the learning and upskilling opportunities made available to employees by the bank. A few participants made mention of the self-learning required of employees to adopt the various technologies introduced by the bank and the learning content provided by the bank that supported this. The bank provided employees access to Udemy courses to facilitate their self-learning and upskilling.

Quotes:

Participant 5: “Mostly it's adapting to the new technology resources introduced and to learn and up-skill most of the employees.”

Participant 5: “… and tools like Udemy where you can upskill yourself with some of the tools that you need to use in order for you to be able to deliver the product.”

Participant 8: “From an employee perspective, there's been a lot of learning quite quickly as well … and we've actually got a colleague now that's come in and she's doing all sorts of Udemy courses and everything, and getting herself up to speed and up skilled so that she's able to carry on.”

Participant 11: “So what the bank has done is they've introduced a number of educational offerings that an individual can take up for example leadership, how to apply gratitude, ways of thinking, ways in running remote meetings.”

4.6 Covid-19 influence on remote working

The major theme, Covid-19 influence on remote working, identifies and expands on the Covid-19 influences on employees and the bank in the context of remote working. Covid-19 drove the need to implement technology that enabled remote working as the health and safety of employees was paramount. Remote working was the mechanism to provide this safety. Four sub-themes were determined to comprise the major theme namely: Emotional and physical effects of Covid-19; Lack of human connection; Digital transformation and Quality of life.

4.6.1 *Emotional and physical effects of Covid-19*

There is no doubt that people were emotionally and physically affected by Covid-19. A number of participants mentioned these emotional and physical effects. There were physical and emotional effects when employees contracted the disease and had become ill. Employees experienced emotional strain because of the passing away of colleagues or family members.

Quotes:

Participant 1: “… the effects of COVID physically on people, where people have gotten ill, where people have passed away where teammate members, colleagues and family members, et cetera in and out of, of your working space have actually passed away.”

Participant 2: “I'm sure you can kind of imagine the emotional complexities that people experienced during COVID one, if you're impacted by COVID directly as an experiencing the sickness two indirectly through losses, et cetera.”

Participant 10: “But I think the now is more that emotional lag of what Covid does.”

4.6.2 *Lack of human connection*

Human connection relates to how employees relate and interact with each other on a human level. The overwhelming majority of participants pointed out the lack of human connection that was felt. There was a lack of human interaction in the virtual environment and this culminated in a loss of connectedness. Employees felt alone and isolated. The office banter and the social interaction had disappeared because the virtual environment had discouraged it.

Quotes:

Participant 10: “Whereas in the office, if you think about it, it's oh I dawdle around, I grab a cup of coffee. Which is good for social interaction. That's what I'm saying. That connectedness is lost now.”

Participant 11: “So the loneliness and the individuals feel, I want to use the word empty, meaning that there's no social involvements and not all individuals will use cameras.”

Participant 12: “Because we are isolated. No meeting and greeting people. We don't even know the people’s faces. We speak to them every day. Even though we do sometimes video call, but it's not like we see them.”

Participant 13: “Yes, a hundred percent because the last thing you want to do is to have an informal conversation on Teams with someone, phoning them and then like, oh, how was your weekend? How's your family?”

4.6.3 *Digital transformation*

Digital transformation refers to the process of the bank implementing digital technologies in its operations and customer offerings and transitioning to a digital company. A few participants stated that Covid-19 had accelerated and intensified the bank’s focus and efforts on digital transformation. Operations were digitally enabled, customer offerings were digitised and previous analogue activities were migrated to digital platforms.

Quotes:

Participant 4: “… what the business is trying to implement is us becoming and being digital.”

Participant 7: “… because of remote working and COVID there's a lot more focus in digitizing and digital developments.”

Participant 10: “It actually enhanced the fact that we need to become more digital.”

Participant 13: “So I think an example, there would be the daily scrum would be not a call, It would be a meeting. It's obviously a Teams call now.”

4.6.4 *Quality of life*

Quality of life refers to the welfare of employees and the extent to which they enjoy their lives specifically in relation to the influence on this enjoyment. All participants bar one referenced the influence that Covid-19 had on the quality of life of employees. Both positive and negative influences on the quality of life were raised.

A significant number of participants touched on the longer hours that they found themselves working which was clearly a negative influence on their quality of life. This was due to more being put on their plate as well as an increased focus on delivery. A contributing factor was the reduction in travelling originating from remote working which freed up more time for work. Another reason for the longer hours was the difficulty of maintaining a work-life balance. Packing a laptop away and leaving the office created a boundary between work and home that no longer existed when employees worked from home especially with the work laptop in full view.

Although the reduction in travelling had a negative side effect because it contributed to longer hours being worked, it could be argued that it was positive due to the monetary savings thus promoting the welfare of employees. There was an increase in the quality of life because of the flexibility that was introduced. Employees were no longer bound to work at the office but could work from anywhere, even in another province. In addition, they could quickly run personal errands during work hours and be back working again without significant work disruption which was not possible when they were at the office. Having family in close proximity was also a benefit.

Quotes:

Participant 4: “And then you think of those people, who've had to worry while sitting at work, they got to pick their kid up from school and drop them off at aftercare whatever the case is. Now it’s no problem because they do it pop home quickly and they back online working again, because most people's chores are around the house rather than around the office area. So I think from that point of view and also the fact that we can work from anywhere, like you there, we here in KZN, what a pleasure.”

Participant 6: “Now it's work still on your kitchen counter or on your coffee table, sitting there. So on the psyche, what happens if you look at that laptop, you think about work, you don't actually get a chance to switch off and rest. There is no boundaries.”

Participant 9: “… now on a daily basis because you don’t have a scenario where you're actually driving to the office …”

Participant 9: “Everyone knows they can still do their daily activities and quickly jump onto a phone call, join the Teams meeting by the laptops or their phones while conducting their personal business, dropping off kids, et cetera.”

Participant 13: “I think that now that you're working from home, the people are working longer hours and there is no cutoff for some people.”

4.7 Remote working influence on the Agile Methodology

The major theme, Remote working influence on remote working, identifies and expands on the remote working influences on the agile methodology of the bank. The integration of remote working technology into the daily work activities of employees played a key role in this influence. Eight sub-themes were determined to comprise the major theme namely: Adoption and improvement of agile practices; Virtual interaction; Communication and collaboration; Team dynamics; Trust and transparency; Productivity; Management oversight and control and Values and principles.

4.7.1 *Adoption and improvement of agile practices*

For any organisation, the bank included, the decision to implement an agile methodology does not end there. There is always room to improve the implemented agile practices and for these practices to be adopted by other departments that had not embarked on an agile journey. A majority of participants alluded to the adoption and improvement of agile practices that had occurred due to remote working.

Several participants raised the fact that some technology teams were historically lagging in their agile maturity. However, with remote working, there was increased focus and effort to improving their agile practices. The bank had implemented the agile methodology in its technology areas. However, it

transpired that the business areas had also begun to adopt agile practices in their operations by using Miro boards to run their teams.

This resulted in the bank's agile maturity as a whole improving due to remote working with Covid-19 being the catalyst.

Quotes:

Participant 2: "I think it (remote working) forced them to look at how they could improve (the bank's agile maturity). I think if it was not for COVID, we would probably take a lot longer to achieve the state that we currently in."

Participant 4: "So even people doing their normal claim stuff, payment of claims, et cetera, they using Miro boards as well to run their teams, which, which has worked out quite nicely."

Participant 6: "I think it's for the better because we are even pushing those teams into adopting better agile principles."

Participant 6: "… a bigger team with more deliverables and that bigger teams doesn't always run as agile as a dedicated, focused team."

Participant 10: "And I think that's what I'm saying that the whole thinking around agile methodology and principles was very much only linked to Tech, but in our world, we trying to tip it over its head where it actually is almost business trying to lead that conversation so that everybody's aligned and it's not just coming from one side."

4.7.2 *Virtual interaction*

In an office environment, colleagues interact with each other face-to-face. The Agile Manifesto views face-to-face interaction as the best way to share information. With the introduction of remote working, this was no longer possible and interactions became virtual. All the participants mentioned that virtual interaction had become the norm.

A vast majority had the view that the virtual interaction especially with having cameras on provided the face-to-face interaction which is required by the Agile Manifesto. However, a disadvantage mentioned of virtual interaction was the inability to read a person's expressions or body language or getting a sense of the mood of a meeting. In addition, it was mentioned that virtual interaction was not as effective in promoting understanding between colleagues and the ability to just walk over to someone's desk to discuss an ad hoc issue was missing.

There were individual participants who disagreed with the majority view. One participant expressed an opposite view on the substitutability of virtual interaction and stated that there was no longer face-to-face interaction because they could not sit next to the person or see them. Another participant had a different opinion in that the inability to read a person's expressions and body language was actually an advantage as they could now concentrate on what the person was actually saying and practice active listening.

A few of the participants were of the view that virtual interaction was actually more effective specifically for the more technical roles as they could virtually discuss their work without leaving their workspace. Although, one of these participants did state that managerial and strategic discussions would be more productive when held physically in a room rather than on a virtual meeting.

Quotes:

Participant 1: "In my opinion, I think this is still being practiced, you know, although we working remotely tech like Teams exactly like we are here now is basically providing the face-to-face interaction from a virtual perspective. I think that still meets that how can I say that qualifier of face-to-face conversation."

Participant 6: "Whereas a technical guy, I quickly want to show him this screen. I quickly want to look at this piece of code, then look at your face, but look at that. So it's easier on Teams whereas on a face-to-face you have to run between people's machines or laptops. But for management levels, I can definitely say face-to-face is a bit better because we actually had a session, a meeting in xxx, not too long ago that I actually realized, yes, we got so much

more done in that room face-to-face then we would have if everyone was on the teams meeting."

Participant 7: "… it takes a lot longer for the new teams to get comfortable with our products, our processes, and how we work because we don't have that interaction face-to-face and being able to just sit in a room for half an hour and draw pictures for them to understand."

Participant 9: "I think has benefited a lot more because you're not concentrating just on what the person, their facial expressions. Half the time you don't see it. You can actually listen to what they're saying and that's made a huge difference from my point of view, from an analysis where you really listening to what they're saying and not looking at their facial expressions so you can actually identify the problem a lot sooner and faster."

Participant 11: "So with no face-to-face interaction you don't see the body language, you don't see the facial expressions. You can't actually get the real feel of what is coming across in a room versus on a remotely camera basis."

4.7.3 *Communication and collaboration*

Communication and collaboration are key tenets of the Agile Manifesto. These underpin the success of agile project delivery. The manner in which these took place was transformed into virtual interactions because of remote working. All the participants referred to some influences that were brought in when communicating and collaborating remotely.

A significant majority of participants had noted that meetings had increased. Setting up meetings had become easier as availability of meeting rooms was no longer a constraint and no time was wasted walking to meeting rooms. The overall consensus was that the increase in meetings was a negative development as this introduced meeting fatigue. However, one participant indicated that the increased meetings enabled people to be more productive.

A widely held belief amongst participants was that communication, collaboration and knowledge sharing had increased and was easier and more effective. The increase in communication, collaboration and knowledge sharing was necessary as team members no longer interacted with each other physically on a daily basis. This increase and improvement was facilitated by the remote working technology implemented. The use of Microsoft Teams allowed group chats and meetings of more than forty people to be recorded, where everyone had visibility of what was being discussed, where in the past, it was impossible to even find a meeting room to accommodate forty people. Another advantage of Microsoft Teams is that it indicates immediately when someone is available for a quick chat whereas in the office, you would have to check multiple times to see if someone was available. Through Miro, visibility on the progress of project activities as well as any problems experienced, was increased for everyone from support up to executive level.

A contributing factor to the improvement in communication was the fact that more structured and focussed conversations were being held. These conversations were focussed on the business topic at hand with very little interpersonal banter compared to the past. An opposing view offered was that there were virtual meetings without agendas and that meeting attendees tended to be distracted and did not pay sufficient attention as they were answering e-mails or working on other items.

Several participants said that they experienced a deterioration in communication and collaboration. It was better to be able to walk over to someone to discuss something on a whiteboard or get a quick decision. Working with new teams, they tended not to utilise the Microsoft Teams chat functionality, preferring to wait for the collective group sessions to raise concerns or seek clarity. The drawback of Microsoft Teams was that the contribution of introverted people could be overshadowed in the virtual meetings or that they would not contribute at all where this was less likely in a physical setting where they would be visible.

Quotes:

Participant 1: “So that is something, so you get to meet a whole lot of other people, you get to collaborate with them and you get to see what's happening elsewhere in the bank. Well over other business units, stuff like that and see different products that are being launched and things like that.”

Participant 4: “… it's probably still better for the guys to be in an area together where if somebody needs to discuss something quickly, they quickly jump up to the whiteboard, discuss, agree, and move on.”

Participant 7: “… where if it's completely new people that you haven't worked with before they seem to wait until we in this collective group and then ask questions or get clarity on certain things.”

Participant 8: “No look, there's definitely more meetings. It's actually ridiculous. And sometimes, you know, I say , since I've started work, sometimes people have meetings to discuss something and then to set up another meeting. A follow-up meeting and then another followup meeting.”

Participant 9: “Now it's simply actually just starting a group chat asking all the questions you want roping in all the key role players and it's more visible for everyone. So everyone starts understanding the process where you're not jumping around asking this person and that person on an email chain, you actually just doing it in a live format, in the chat or a Teams meeting.”

Participant 13: “I think also now we get to the point quicker. We wouldn't have a meeting for an hour to discuss something because we know exactly what we need out of that and we get it done.”

4.7.4 *Trust and transparency*

In a successful agile team, trust is placed in team members that they will execute their tasks. This trust can be confirmed with the transparency provided in the agile ceremonies. Remote working migrated these ceremonies to a virtual

environment. All the participants mentioned the influence that this had on trust and transparency.

The participants were divided in terms of whether trust had improved or deteriorated. Factors cited for the reduction in trust were i) it was difficult to ascertain if someone was being truthful because you couldn't read their facial expressions and they could pretend to be at home working when in actual fact they were doing other things ii) it was difficult to build trust virtually with new team members iii) it was difficult to trust that people were getting the job done working remotely. Factors cited for the improvement in trust were i) there was no other option and people had to trust others and in turn be trusted ii) good relationships formed the basis of increased trust.

The majority of participants indicated that transparency had increased since everybody had sight of the progress and the challenges of project activities posted on the Miro boards and knowing what each individual was busy with. A number of participants believed that transparency had deteriorated because it was easier for difficult individuals to be less transparent in the remote working environment.

An interesting observation by several of the participants was that trust is a function of transparency. If people are transparent then it will be easier to place trust in them since it would follow naturally.

Quotes:

Participant 4: "People not being at home, working often hearing people in their cars because they're on their way somewhere and trying to hide the fact that they doing so."

Participant 5: "In terms of transparency it's actually easier for us. It's no longer an issue because of we have all the tools like Microsoft and the boards to keep track of everything that is happening on the board or on specific project so we more or less have a clue or have an understanding of what each individual is

busy with or what they're doing and what are the challenges that they're encountering."

Participant 6: "In your difficult resources transparency has gone down… If they were difficult to manage and shady in the office, it's just even worse working remotely, because it's easier to do it."

Participant 6: "So your people's transparent if they tell you listen here I'm quickly stepping out. I'm going to be back in a little bit. That goes with the whole trust as well. If they're transparent and honest with you they will get away with a lot of the items."

Participant 10: "Trust, I think improved by 150% because you had to trust."

Participant 12: "But now it's just, we just hear the voice and we don't know if they telling the truth."

4.7.5 *Team dynamics*

Team dynamics are the ways in which team members interact and relate with each other. From an agile perspective, these dynamics were established through physical face-to-face interactions on a daily basis. With the advent of remote working, these interactions became virtual. A large majority of participants mentioned that there was an influence on the team dynamics because of remote working.

A minority of participants felt that team dynamics had deteriorated. There was a noticeable increase in friction in the teams because it was more evident when people were not doing their work since the Miro boards made this more transparent. Aspects of interpersonal banter and physical face-to-face interaction which improved team dynamics and morale were missing in the remote working environment especially with new team members that you had never met. If you saw them in the grocery store you were likely not to realise they were your team member.

The overall consensus though was that team dynamics had improved. Team members were more understanding of each other and their personal circumstances and were more willing to assist each other. One team had instituted daily team lunches and tea breaks to understand each other on a personal level. Managers of teams had to be more deliberate in engaging with their teams and ensuring that their teams were interacting and engaging with each other.

Quotes:

Participant 5: “And also we had team lunches and tea breaks during the day, just to catch up and to understand each other's challenges and backgrounds and day-to-day family lifestyle that you are encountering or that you're going through.”

Participant 6: “They assist each other more easily. The tools make it easier to help your colleague quickly with something than otherwise.”

Participant 9: “… but overall, because the teams collaborate so closely these days that we more understanding of each other and you take into account their personal environment, there might be kids screaming in the background or dogs barking. So it does add a human touch.

Participant 10: “So in the past where it was a manager that never had a let's say a team session or a one-on-one now you can't run and hide away. You can't wait for a conversation PD time or whatever the case may be if you don't have proper engagement.”

Participant 12: “Definitely team dynamics has become worse because you don't know if you go to the grocery store and if you see the person, we don't even know that he's your colleague.”

Participant 13: “So I think that the team dynamics was more prevalent pre COVID because we were together all the time. I think because when we’re working together and we sat together, there's that aspect of non-work-related

chirping and team morale. How's your kids, how's this and what did you do the weekend? … because the last thing you want to do is to have an informal conversation on Teams with someone, phoning them and then like, oh, how was your weekend? How's your family?"

4.7.6 *Productivity*

Productivity is a measure of the output of individuals and teams. This output was directed by the bank's agile practices which had to integrate the remote working technology that was implemented. All the participants indicated that productivity was influenced by this integration.

Personal productivity increased for a number of participants as there was more time to allocate to high value tasks and there were productivity gains introduced by the remote working technology such as the ability to record workshop sessions and review them later and improved communication through group chats on Microsoft Teams. However, other participants had experienced colleagues that were not productive working from home as they were focussed on other activities besides work.

The overwhelming majority of participants highlighted the improved productivity in terms of increased project delivery. A few participants mentioned that this was counterintuitive as they had expected the remote working influence to reduce project delivery. One participant believed the rate of delivery was unchanged.

Other aspects that were mentioned which could have an influence on productivity were the increased delivery focus and the quicker decision making.

Quotes:

Participant 1: "So myself personally, I have more time to allocate to higher value or productive tasks."

Participant 4: “I think, so you're always going to have people that are lazing around because you know, they're working from home, they doing other things, they're not focusing.”

Participant 4: “So it is a bit of a contradiction because the whole thing lends itself to people not being as efficient as what they used to be. However, the stat show that a lot has been delivered.”

Participant 11: “So funny enough, we have been able to deliver a lot more being remote. We have been able to do a lot more releases. We do one or two releases in a month, so it's weird.”

4.7.7 *Management oversight and control*

A high degree of management oversight and control is contrary to the Agile Manifesto as teams are expected to be self-organising and empowered to make decisions. With the introduction of remote working, this management oversight and control became virtual. A majority of participants commented about the influence on management oversight and control.

A number of participants stated that management oversight and control had increased as management wanted to ensure that work was continuing and project objectives were being met. A level of micromanagement had crept in with difficult resources where multiple check-ins were held daily. One participant believed that management oversight and control had actually diminished.

Management oversight and control was also more difficult in the virtual environment when compared to the office since managers were no longer sitting with their teams around a table and they were no longer able to see what the teams were busy with.

Quotes:

Participant 2: “… ensuring that whatever activities we needed to get done, was getting done. So I think we moved away from monitoring delivery, through controlling delivery as a leadership.”

Participant 5: “… if you are a leader of the team in the office, you are able to communicate in your team on the table the whole time. Right. And you are able to actually see what they're doing. See their progress and get rapid updates throughout the day, but then now it's more like you can’t see them physically as to where they are, what they're doing at which point in time. “

Participant 6: “So those guys that need to be micromanaged that has an effect on the efficiency and the adoption of the agile methodology because the guys tend to not attend the meetings or the ceremonies that they supposed to.”

Participant 11: “So by the looks of things, they wanting more control over what's been delivered, human capacity, turn around times, et cetera.”

4.7.8 *Values and principles*

The values and principles of the Agile Manifesto specify the values that agile teams should espouse to and the principles that they should follow. With the introduction of remote working, these values and principles were applied virtually. All the participants provided their perspective on the remote working influence on the values and principles.

a. *Value 1*

The majority of participants felt that adherence to the value was reinforced and improved as more interactions were taking place and foreign based resources could now be included in these interactions because of the remote working technology. The negative aspect mentioned was that you could not have a face-to-face discussion at a whiteboard.

b. ***Value 2***

The participants were divided between this value not being influenced and the adherence being reinforced and improved. Reinforced adherence was a result of documentation decreasing drastically because of the use of the Miro boards to write user stories and delivering software that is not necessarily perfect.

c. ***Value 3***

The majority of participants felt that the value was not influenced. The rest thought that adherence was reinforced and improved because there was more communication and collaboration between the business and the project teams to make mutual project decisions.

d. ***Value 4***

The majority of participants felt that adherence to the value was reinforced and improved as the business was forced to move quicker and re-prioritise because of the changing digital demands. There was one dissenting view as the participant felt that there were times that team members did not address items immediately preferring to wait for a meeting. The rest thought that the value was not influenced.

e. ***Principle 1***

The participants were divided between this principle not being influenced and the adherence being reinforced and improved. Reinforced adherence was a result of the focus on satisfying the customers' needs in the remote working environment.

f. ***Principle 2***

The majority of participants felt that the principle was not influenced. There was one dissenting view as the participant felt that the broader bank teams were hesitant to accept changing requirements. The rest thought that adherence was

reinforced and improved because of the need to stay relevant and competitive for customers.

g. ***Principle 3***

The majority of participants felt that the principle was not influenced. The rest thought that adherence was reinforced and improved because of the shift in focus to deliver functionality incrementally.

h. ***Principle 4***

The participants were divided between this principle not being influenced and the adherence being reinforced and improved. There were two participants who felt adherence had deteriorated because their interaction with business had dropped. Reinforced adherence was due to the ease of setting up a Microsoft Teams meeting with the business and not having to find them physically.

i. ***Principle 5***

The majority of participants felt that adherence to the principle was reinforced and improved as the focus was on becoming less hierarchical and structuring project teams to deliver. There were several dissenting views where the participants felt that it was difficult to maintain the required levels of motivation.

j. ***Principle 6***

The majority of participants felt that this principle was negatively influenced either because virtual face-to-face interaction is not as effective as physical face-to-face interaction or that it did not meet the definition of face-to-face interaction. A number of participants felt that the adherence was reinforced and improved because the interaction was more direct and efficient. The rest felt that there was no influence as virtual interaction with cameras could be deemed face-to-face interaction.

k. ***Principle 7***

All the participants stated that there was no influence on this principle.

l. ***Principle 8***

The majority of participants felt that the principle was not influenced. The rest thought that the principle was negatively influenced due to lower levels of involvement from sponsors.

m. ***Principle 9***

The majority of participants felt that the principle was not influenced. There were several dissenting views where the participants felt that the principle was negatively influenced because the attention paid in the design process was less in the remote working environment.

n. ***Principle 10***

The overwhelming majority of participants felt that the principle was not influenced. Two participants felt that the principle was reinforced because the focus was on reusability of functionality.

o. ***Principle 11***

The participants were divided between this principle not being influenced and the principle being negatively influenced. The negative influence was due to the added management control that was introduced which reduced the teams' ability to self-organise.

p. ***Principle 12***

The participants were divided between this principle not being influenced and the principle being negatively influenced. The negative influence was due to the cessation of team retrospectives and one participant challenged whether a team's behaviour actually existed in a remote working environment. One participant had a dissenting view and believed that teams were reflecting more on what could be done better in future sprints.

q. ***Relevance of the Agile principles***

Several participants questioned the continued relevance of some of the agile principles. One participant actually stated that it was time for a re-look at the Agile Manifesto given the new ways of work and the new approaches investigated by global companies in pursuit of quicker ways of delivery such as co-designing with customers which the Agile Manifesto does not reference.

4.8 Remote working challenges

The major theme, Remote working challenges, refers to the challenges that employees face when working from home. Under this theme, there are two sub-themes, namely: Connectivity and loadshedding and Home workspace.

4.8.1 *Connectivity and loadshedding*

In order to work remotely, employees need the ability to connect to the bank's systems and also have electricity to maintain this remote connection. The vast majority of participants mentioned the issues that were experienced with connectivity and loadshedding.

The bank had implemented technology to allow employees to connect remotely to the bank's systems. However, the employees still needed access to the internet in order to connect remotely. Bad network connections to internet providers were a major complaint together with issues with poor bandwidth and network speeds and high data consumption.

Loadshedding was also a big issue as employees did not have backup power to continue running laptops or routers to connect to the internet.

The issues with connectivity and loadshedding resulted in employees being unable to join meetings or continue working. This had a detrimental effect on their productivity.

Quotes:

Participant 4: “Obviously some people's network speeds and some of them are relying on the 3G card that xxx given them. They don't have any other means of connecting and can’t afford putting in fibre and all those sorts of things.”

Participant 4: “So I suppose the other thing is the loadshedding that we went through earlier in the year, and that affected a lot of people because they don't have the backup power like we used to have at the office. . There are people that couldn't join meetings or couldn't work.”

Participant 6: “… what some other colleagues do is they move around inside of their house on the laptops battery so when loadshedding hits they there for about an hour and then they sit with a problem where they can't connect anymore.”

Participant 11: “So as well as being remote, sometimes you have major connection issues, network connection issues…”

4.8.2 *Home workspace*

Working from home, people were required to set aside a space to work from. However, a number of employees mentioned that it was not physically possible to have a separate home workspace away from distractions. These distractions were caused by the employee’s spouse, children or pets preventing them from focussing and concentrating on their work. If the employee was in a meeting with other colleagues, the noise generated by the employee’s partner, children or pets would inevitably be heard by the other meeting attendees.

Quotes:

Participant 4: “You've got people sitting in rooms that where they can't focus and concentrate because perhaps them and their spouse or partner are doing this, working in the same area, people have got distractions at home such as children, et cetera.”

Participant 5: “… the challenge we have encountered has been around finding a proper workspace in your own home that you be able to work from.”

Participant 6: “So some of the other challenges I see some of the colleagues have is when working from home, they don't really have a separate, quiet area that they can work from. When they speak to you on a meeting, you can hear kids running around in the background. There's a lot of noise, there’s other people making food and stuff like that so it's not a real focus.”

4.9 Findings pertaining to Proposition 1

Digital transformation in the bank would be accelerated through remote working and virtualisation of offices. However, employees would feel isolated and be unable to establish boundaries between work and personal life.

In Section 4.5.2 it was evident that remote working technology was digitally transforming the bank as communication and collaboration was occurring digitally with employees connecting to the banks’ systems remotely. An increase and acceleration in the bank’s initiatives to enable digital transformation was noted in Section 4.6.3. Customer offerings and bank operations were being digitised and analogue activities were being migrated to digital platforms. The deleterious effects on employees were discussed in Sections 4.6.2 and 4.6.4. Employees were lacking the human interaction which resulted in a loss of connectedness and a sense of isolation. They were also experiencing difficulty in maintaining a healthy work-life balance due to the longer hours working from home and the difficulty in creating a boundary between home and work life.

4.10 Findings pertaining to Proposition 2

The productivity of the agile methodology would be challenged by issues with collaboration, team integration and the difficulty to adhere to the agile values and principles.

The productivity of the agile methodology did not seem to have been challenged as there was an increase in productivity in terms of project delivery as discussed in Section 4.7.6. In fact, a few of the participants found this counterintuitive as they too expected remote working to reduce productivity. In addition, it was found in Section 4.7.3 that the majority view was that communication, collaboration and knowledge sharing had actually increased and was easier in the remote working environment. Virtual meetings could accommodate many more attendees, Microsoft Teams indicated immediately when colleagues were available and Miro increased the visibility of project progress to all interested stakeholders. Opinions were divided on whether trust had improved as discussed in Section 4.7.4. However, team dynamics was mentioned in Section 4.7.5 to have improved with team members being more understanding of each other's personal circumstances and more willing to assist each other. Thus, this had a positive influence on team integration. Section 4.7.8 dealt with the values and principles of the Agile Manifesto. It was found that certain values and principles were challenged in the remote working environment, but the majority of values and principles were in fact reinforced or improved. However, the continued relevance of some of the principles was questioned by several of the participants.

4.11 Findings pertaining to Proposition 3

Virtual interaction would have a negative influence on Principle 6.

There was no consensus on whether virtual interaction would have a negative influence on Principle 6. In terms of virtual interaction, it was mentioned in Section 4.7.2 that virtual interaction with cameras on provided the face-to-face interaction required by Principle 6. However, there were challenges such as

promoting understanding between colleagues virtually and being able to read their facial expressions or body language although one view proffered was that being unable to see facial expressions and body language promoted active listening. In Section 4.7.8. the majority of participants believed that Principle 6 was negatively influenced because either virtual face-to-face interaction was not as effective as physical face-to-face interaction or that it did not meet the definition of face-to-face interaction. However, there were participants who felt that Principle 6 was actually improved as the virtual interaction was more direct and efficient. The balance of participants thought that Principle 6 was unaffected because a virtual interaction with cameras on could be deemed to be face-to-face interaction.

4.12 Summary

The findings of the thematic analysis performed on the participants' views on the influence of Covid-19 and remote working on the agile methodology of the bank was presented. These views were discussed according to the four major themes that were identified and drilled down into sub-themes. These major themes encompassed the adaptation of employees to changes in their environment, how Covid-19 influenced remote working, how remote working influenced the agile methodology and the challenges experienced with remote working.

The findings

- support Proposition 1 as digital transformation was accelerated in the bank through remote working and virtualisation of offices and employees were feeling isolated and unable to establish boundaries between work and personal life.
- did not support Proposition 2 as the productivity of the agile teams, their collaboration and team integration had increased. However, the findings did suggest that there some difficulties in adhering to some of the agile principles.

- were inconclusive with respect to Proposition 3 as there was no consensus. Some participants stated that Principle 6 was negatively influenced by virtual interaction because virtual interaction was not as effective or because it did not meet the definition of face-to-face interaction. Other participants felt that Principle 6 was improved by virtual interaction. The remainder of participants thought that there was no influence on Principle 6.

CHAPTER 5. DISCUSSION OF THE FINDINGS

5.1 Introduction

This chapter analyses and discusses the findings presented in Chapter 4 in the context of the literature review positioned in Chapter 2.

The purpose of the study was to establish how Covid-19 and remote working had influenced the agile methodology of a South African bank. To fulfil this purpose, the study sought to understand how Covid-19 had influenced remote working and how remote working had influenced the agile methodology. A further objective was to understand how Principle 6 of the Agile Manifesto was influenced.

The average tenure of participants was 9.5 years which is indicative of excellent institutional knowledge and the average agile experience of participants was 6.5 years which is indicative of good knowledge and experience of agile practices. This speaks to the quality of the participants who were interviewed.

Table 6 below highlights the themes that were identified in relation to the research questions and propositions.

5.2 Discussion pertaining to Proposition 1

5.2.1 *Digital transformation of the bank*

Covid-19 expedited digital transformation in organisations as a result of the forced acceleration in adopting and implementing remote working technology (Soto-Acosta, 2020; Kudyba, 2020). Remote working drove this digital transformation of the workforce as it was mandated to prevent the spread of Covid-19 (Savić, 2020). A key enabler of this digital transformation is technology that transitions analogue offerings to digital offerings (Osmundsen et

Table 6: Research questions, propositions and themes

Research Question	Proposition	Themes
How has Covid-19 influenced remote working?	Digital transformation in the bank would be accelerated through remote working and virtualisation of offices. However, employees would feel isolated and be unable to establish boundaries between work and personal life.	Emotional and physical effects of Covid-19, Lack of human connection, Digital transformation, Quality of life, Adaptability of people, Remote working technology, New ways of work, Change management, Learning and upskilling, Connectivity and loadshedding, Home workspace
How has remote working influenced the agile methodology?	The productivity of the agile methodology would be challenged by issues with collaboration, team integration and the difficulty to adhere to the agile values and principles.	Adoption and improvement of agile practices, Virtual interactions, Communication and collaboration, Trust and transparency, Team dynamics, Productivity, Management oversight and control, Values and principles, Adaptability of people, Remote working technology, New ways of work, Change management, Learning and upskilling
How has Principle 6 of the Agile Manifesto been influenced?	Virtual interaction would have a negative influence on Principle 6.	Virtual interactions, Values and principles

al, 2018; Savić, 2020) and enables virtual offices (Ismail et al, 2017) and remote collaboration (Henriette et al, 2016; Savić, 2020). This digital transformation would introduce a new way of working for employees with the incorporation of remote working technology into employees' daily activities (Henriette et al, 2016) and for it to be successful, organisations need to engage employees in the change process (Osmundsen et al, 2018).

The findings of the research are in agreement with the literature. Remote working technology was identified as the key driver for the virtualisation of communication and collaboration in Section 4.5.2. The integration of the remote working technologies into the daily work activities of employees created a virtual office environment. The cause of the increasing intensity and acceleration of the bank's digital transformation was identified as Covid-19 in Section 4.6.3. The effects of this digital transformation were the digital enablement of operations and the migration of analogue activities to digital platforms. The integration of remote working technology into the work activities of employees introduced new ways of work as highlighted in Section 4.5.3. This was a major change that employees had to adapt to as they were now interacting virtually with colleagues instead of physically face-to-face. Section 4.5.4 referred to the fact that not all employees were successful in adapting to the new remote working environment. The bank initiated change management initiatives to assist all employees in incorporating the new ways of work into their personal and work lives.

The findings of the research raised three aspects that were not mentioned in the literature with regards to the influence of Covid-19 on remote working namely Connectivity and loadshedding, Adaptability of people, and Learning and upskilling. Connectivity and loadshedding was raised in Section 4.8.1 as a challenge for remote working as it affected the employees' ability to work remotely. In terms of connectivity, there were issues with bad network connections, poor bandwidth and network speeds and high data consumption. With loadshedding, employees did not have backup power to continue supplying power to their laptops and routers and thus were unable to continue

working remotely while loadshedding persisted. The issues raised with connectivity and loadshedding are typical of South Africa which has been known for high data costs and electricity disruption, and thus are not general phenomena globally. This is most likely why the literature is silent on loadshedding and conversely posits that remote working was enabled by the availability of fast and large bandwidth at home (Papagiannidis et al, 2020).

Adoption of the new digitally transformed ways of work was dependent on the adaptability of people highlighted in Section 4.5.1. Not all employees exhibited this ability at the requisite level as there were employees who struggled to adapt and thrive in the new environment and were actually underperforming. The factors that influence this adaptability were not evident from the research findings. However, a potential factor could be personality traits as the literature established a link between a person's remote working preference and their personality traits (Murray, 2020). The change management initiatives mentioned earlier were instituted to improve the adaptability of employees. In addition to the change management initiatives, Section 4.5.5 makes mention of the bank providing learning and upskilling opportunities to assist employees in adopting the remote working technologies and thus adapting to the new ways of work.

5.2.2 *Employee isolation*

The negative effects of remote working during Covid-19 on employees were found to be the sense of isolation which could have sociological and psychological challenges, and the inability to create boundaries between work and personal life (Savić, 2020). Zola (2014) cited this inability to create boundaries and increased working hours but did not mention a link between the two.

These negative aspects of Covid-19 were borne out in the research data. The lack of human connection was discussed in Section 4.6.2. It was a result of the lack of human interaction since the office banter and the social interactions were no longer possible. In the end, employees were left feeling alone and isolated. Difficulty in maintaining a work-life balance was raised in Section 4.6.4.

It was a challenge to create a boundary between work and home especially with the work laptop in full view sitting on the coffee table which can be attributed to the inability to create a separate home workspace as elaborated in Section 4.8.2. Without a separate home workspace, work and personal life impinged on each other and resulted in employees working longer hours. This link was not evident in the literature.

The findings of the research raised two aspects that were not fully addressed in the literature namely Emotional and physical effects of Covid-19 and Quality of life. The literature referred to the psychological challenges of Covid-19 due to a sense of isolation, but did not mention the emotional and physical effects of contracting the disease which was discussed in Section 4.6.1. The emotional strain because of bereavement when employees lost colleagues or loved ones was also raised. Although there were effects reducing the employees' quality of life, there were positive effects as well. The monetary savings due to the reduction of travel was improving the welfare of employees and they enjoyed more flexibility by being able to work anywhere and to run errands during work hours.

5.3 Discussion pertaining to Proposition 2

5.3.1 *Productivity of the agile methodology*

The influence of remote working on agile has introduced new ways of work, remote working technology and required intensified training efforts (Mancl & Fraser, 2020). According to literature, the execution of the agile methodology in a remote working environment would be challenged by issues with collaboration, team integration (Zola, 2014) especially with new team members, and the difficulty of adhering to the values and principles (Mancl & Fraser, 2020). The collaboration issues stemmed from the fact that virtual interactions were less effective than physical face-to-face interactions for ad hoc discussions and whiteboarding (Mancl & Fraser, 2020). Because of these challenges, it was posited that the productivity of the agile methodology in the

bank would be challenged. However, there were advantages to working remotely with agile as some survey respondents felt their productivity had increased due to fewer distractions and that virtual discussions were more crisp and concise (Mancl & Fraser, 2020).

The data collected indicated that the productivity of the agile teams working remotely had improved in Section 4.7.6. This improvement was seen in the increase in project delivery. There was a view that this was counterintuitive which aligned to the position of Proposition 2. A rise in personal productivity was experienced which was corroborated by literature. The majority view in Section 4.7.3 was that communication, collaboration and knowledge sharing was easier and more effective. The remote working technology allowed more project participants in virtual meetings, project participants had full visibility of project activities including any issues hampering progress and colleagues could be contacted immediately as they became available online to resolve problems. This resulted in the volume of meetings increasing. It was noted that conversations had become more structured and focussed which aligned with the literature. A minority view was that communication and collaboration had deteriorated agreeing with the literature that it was better to explain things standing at a whiteboard or be able to walk over to someone to make a quick decision. However, in Section 4.7.2 the belief was expressed that virtual interactions are more effective for more technical roles as work could be shared and discussed virtually.

Section 4.7.4 highlighted the divided opinions on whether trust had increased or not. It was found that it was difficult to build trust virtually with new team members which agreed with the literature. An increase in transparency was noted as the activities of each team member was virtually accessible to all stakeholders. A view was offered that trust is a function of transparency which coupled with the increase in transparency would suggest that trust had improved on balance. The dynamics between team members was observed to have improved in Section 4.7.5 as team members were more tolerant of each other’s personal circumstances and more willing to support each other and

certain teams had implemented daily team lunches. This environment would support an increase in team integration.

Although certain values and principles were challenged as outlined in Section 4.7.8, the majority of values and principles were found to have been reinforced and improved although the relevancy of a few of the agile principles was questioned. A more radical opinion posited was that the Agile Manifesto needed a review as global companies were exploring new approaches to speed up delivery.

The findings of the research contradicted Proposition 2 in terms of productivity as productivity was seen to have improved. Proposition 2 was based on the literature predicting issues with collaboration, team integration and adhering to the values and principles. The direct opposite of this was discovered in the findings where collaboration was easier and more effective, team integration was better and the values and principles were actually reinforced and enhanced. This explains why the research found productivity to have improved as the factors influencing productivity did not have a negative influence according to the case study. The research findings did not contradict everything in the literature with regards to the productivity factors as they were aligned in several underlying effects. In addition, the findings were aligned to the literature in terms of influences of new ways of working, remote working technology and intensified training efforts on the agile methodology as these were alluded to in Sections 4.5.2, 4.5.3, 4.5.4 and 4.5.5. Section 4.5.4 dealt with change management which was not explicitly mentioned in the literature, however training is generally accepted as a mechanism for change management.

The findings of the research raised three aspects that were not mentioned in the literature namely Adoption and improvement of agile practices, Management oversight and control and Adaptability of people. It was found in Section 4.7.1 that the bank experienced an increase in its agile maturity due to additional effort in extending and improving its agile practices. Agile laggards in the bank's technology teams had improved their agile maturity and business areas had started to adopt the agile practices in their operations.

A negative influence on the agile methodology was the heighted management oversight and control mentioned in Section 4.7.7. Management wanted assurance that work was continuing and that there was project delivery. It was highlighted that management oversight and control was more difficult in a remote environment as there were no longer regular interactions between management and their teams. Problem resources required micromanagement such as multiple daily check-ins. These were the most probable reasons for the increase in management control and oversight. Adoption of the influences on the agile methodology is dependent on the adaptability of people and highlighted in Section 4.5.1. There were employees who found it difficult to adjust to these influences which led to the micromanagement mentioned earlier.

5.4 Discussion pertaining to Proposition 3

5.4.1 *Virtual interaction*

Words are not the only mechanism for exchanging information in face-to-face communication as body language conveys information by displaying emotion which adds realism and credibility (Lampropoulos & Siakas, 2018). This was contradicted somewhat by the data collected. In Section 4.7.2. it was found that virtual interaction with cameras could substitute for face-to-face interaction and was more effective for more technical roles. It was mentioned that not being able to read a person's expressions or body language was a disadvantage however there was a dissenting view that this lack instilled active listening.

5.4.2 *Influence on Principle 6*

Proposition 3 was predicated on the fact that face-to-face interaction exchanges additional information that virtual interactions do not and would thus have a negative influence on Principle 6. The research findings in Section 4.7.8 were inconclusive as three different opinions were surfaced – i) Principle 6 was negatively influenced because either virtual interaction did not meet the definition of face-to-face interaction or that it was not as effective as physical

face-to-face interaction ii) the efficacy of Principle 6 was improved because virtual interaction was more direct and efficient iii) Principle 6 was not influenced as virtual interaction with cameras was deemed to be face-to-face interaction.

5.5 Conclusion

The research findings established how Covid-19 and remote working have influenced the agile methodology of a South African bank. This was achieved through understanding how Covid-19 had influenced remote working; how remote working had influenced the agile methodology of the bank and how Principle 6 was specifically affected.

The findings confirmed Proposition 1 in that digital transformation was accelerated in the bank because of remote working and the virtualisation of offices and employees did experience a sense of isolation and found it difficult to create boundaries between work and personal life. This was in complete alignment with the literature reviewed. Connectivity and loadshedding, Adaptability of people and Learning and upskilling were additional aspects of the Covid-19 influence on remote working that the research findings uncovered. With respect to influences on employees, the research findings provided additional insight into the aspects of Emotional and physical effects of Covid-19 and Quality of life.

The findings contradicted Proposition 2 in that the productivity of the agile teams had improved and was not challenged with issues of collaboration, team integration and difficulty in adhering to the values and principles. The literature was refuted by the research findings as collaboration, team integration and adherence to the values and principles had been enhanced. A radical opinion was voiced that it was time to review the Agile Manifesto in the context of the new approaches to project delivery being explored by global companies. However, the research findings were aligned with the literature in several underlying effects of the productivity factors mentioned. Adoption and improvement of agile practices, Management oversight and control and

Adaptability of people were additional aspects of the remote working influence on the agile methodology that the research findings uncovered. The increase in management oversight and control was a negative influence on the agile methodology.

The findings were inconclusive with regards to Proposition 3. Although the literature viewed virtual interaction as deficient in comparison to face-to-face interaction, the findings contradicted this as virtual interaction with cameras on was deemed to be face-to-face interaction albeit with some disadvantages. A minority view was expressed that virtual interaction was in fact superior. There were vastly different perspectives on virtual interaction uncovered by the research which determined whether Principle 6 was either negatively influenced, improved or was not affected at all.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This chapter discusses the conclusions of the study based on the research questions that were posed in Chapter 1. Recommendations and proposals for future studies will be presented. The study was designed to establish the manner in which Covid-19 and remote working had affected the agile methodology of a South African bank. In order to do this, the aspects of remote working influenced by Covid-19 and the facets of the agile methodology adapted by remote working were investigated. Furthermore, the effect on Principle 6 of the Agile Manifesto was examined.

6.2 Conclusions regarding research questions

6.2.1 *How has Covid-19 influenced remote working?*

The influence of Covid-19 on remote working was exerted on both the bank and its employees. Covid-19 was driving the acceleration of digital transformation in the bank. Previous analogue activities in the bank were migrated to digital platforms and its operations were being digitised. Remote working was the manifestation of this Covid-19 driven digital transformation where communication and collaboration became remote with the virtualisation of the office environment. The enabler of remote working was the remote working technology that was implemented by the bank. Integrating the remote working technology into the daily activities of employees introduced new ways of work in the bank. Change management was required to prepare employees for these new ways of work and assist them to transition to the virtual office environment. These findings corroborate what was found in literature.

Additional findings were uncovered which were not found in literature. The experience in the bank was that being able to make sense and adapt to changes introduced into the work environment was a key ability of employees

but that a high level of adaptability was not prevalent in all employees. A factor influencing this adaptability could be personality traits as literature established a link between personality traits and remote working preference. Learning and upskilling was required to improve this adaptability especially with regards to the technology introduced by the bank. Issues with connection and loadshedding affected the employees' ability to work remotely. These issues were typical of the South African context and were not mentioned in the literature. In fact, the literature cited the availability of fast and large bandwidth at home which is at odds with the experience of the bank's employees.

Office banter and social interactions created a connection between employees. This was lost as a result of Covid-19 and lacking this human interaction, employees felt that they had lost connection with their colleagues and ended up feeling alone and isolated. Furthermore, employees were struggling to demarcate a boundary between their personal and work lives which resulted in extra hours being worked. For some it was just physically impossible to create a separate home workspace away from distractions. The negative influence on employees was corroborated in literature except for the link between longer working hours worked and the struggle with creating a boundary between work and home life.

There were aspects that were uncovered in the research that were not covered by the literature. There were emotional and physical side effects of contracting the disease as well as the emotional strain of losing a colleague or a loved one to the disease. Furthermore, there were actual positive effects such as improving the welfare of employees through travel savings and the flexibility that employees now enjoyed that enabled them to work from anywhere and to run personal errands during work hours and have family in close proximity.

6.2.2 *How has remote working influenced the agile methodology?*

The influence of remote working on the agile methodology had brought in new ways of work and remote working technology which required change management to assist employees to adjust to these changes. The productivity

of the agile teams working remotely in the bank was found to have improved in terms of increased project delivery. This contradicted what was expected as productivity of the agile methodology was predicted to deteriorate since it was found in the literature that problems with collaboration, team integration and adherence to the values and principles would be experienced. An increase in personal productivity was noted which aligned to the literature. This increase in personal productivity stemmed from additional time that could be focussed on high value tasks and utilising the productivity gains that remote working technology offered. The research findings did not suggest that this increase was caused by less distractions or the brevity of virtual discussions as indicated by the literature.

The agile teams actually experienced an improvement in communication, collaboration and knowledge sharing as the remote working technology removed the capacity constraints of physical meeting rooms. The unintended consequence was that the volume of meetings had increased. Additionally, real time access to project progress and issues was provided to all stakeholders and this allowed the resolving of these issues as soon as the relevant stakeholders were available online. The virtual interactions were beneficial to technical roles as they could share their work virtually without having to leave their desks. There was a minority view which held that communication and collaboration had worsened and agreed with literature that ad hoc discussions held at whiteboards was more effective than virtual discussions.

There were differing opinions on whether trust had improved or not with several factors provided that either improved or deteriorated trust. The difficulty in building trust virtually with new team members was noted though which agreed with literature. Transparency in the agile teams had increased as each individual team member’s progress was now visible to all stakeholders. Since trust was pointed out to be a function of transparency it can be inferred that trust had increased on balance despite the differing opinions. Team dynamics was improved as team members were more supportive and more understanding of

each other's personal circumstances. These factors served to improve team integration rather than hamper it which was suggested in the literature.

Contrary to the literature, adherence to the majority of the values and principles was found to have either been reinforced or improved. However, the continued relevance of several of the agile principles was questioned. The question was raised as to whether the Agile Manifesto needed to be reviewed as global companies were exploring new approaches in pursuit of accelerated project delivery. As an example, these companies are investigating co-designing with customers which the Agile Manifesto does not make mention of.

Additional findings were surfaced which were not found in literature. The bank experienced an increase in its agile maturity not only within IT but business as well. There were technology teams that were historically lagging in their agile maturity but had experienced an uptick in this maturity due to the intensified effort on improvement that remote working had set in motion. Business areas were also increasingly adopting agile practices into their operations and using Miro boards to run their teams. There was an increase in management oversight and control which is contrary to the agile principles. The reduction in regular interactions in the remote working environment made management oversight and control more difficult and was cited as the reason for the increase. This was the mechanism that management implemented to gain assurance that project delivery was on track.

Successfully adopting the influences of remote working on the agile methodology depends on the adaptability of people. There were employees who struggled to adjust to the new ways of work as their adaptability was not at the requisite level.

6.2.3 *How has Principle 6 of the Agile Manifesto been influenced?*

It was believed that Principle 6 would be negatively influenced with the introduction of virtual interactions as the literature suggested that face-to-face interactions impart additional information such as realism and credibility through

the emotion displayed by body language unlike virtual interactions. However, it was found that virtual interactions with cameras on could substitute for face-to-face interaction and was more effective for technical roles. Not being able to read body language was considered to be a disadvantage yet there was an opposing view that said it enforced active listening to what was being said. Thus, it was inconclusive as to how Principle 6 of the Agile Manifesto was influenced. There were three schools of thought depending on the perspective on virtual interaction – i) Principle 6 was influenced negatively either because virtual interaction was not by definition face-to-face interaction or that it was not as effective ii) virtual interactions were concise and more productive and thus improving the effectiveness of Principle 6 iii) there was no influence on Principle 6 as virtual interaction was deemed to be face-to-face interaction.

6.3 Limitations

Being a case study, this exploratory analysis has the disadvantage that the insights will not be easily generalisable outside the context of the case study. It is based on a single institution and thus cannot consider the nuances of other contexts such as institutions in the same or different industry.

In addition, it is the researcher's contention that the agile maturity, adaptability of employees and change management expertise would need to be considered when analysing the influence of Covid-19 and remote working on the agile methodology in other organisations.

The researcher discovered that there was limited literature available on the influence of Covid-19 and remote working on agile methodologies.

Notwithstanding the above limitations, the researcher believes that valuable insights have been revealed by the research that will be of interest to academic and business audiences.

6.4 Recommendations

The research has shown that there were still employees who were struggling to adapt to the new ways of work. Change management and learning and upskilling efforts should be customised for these employees that takes into account how adaptable they are to the remote working environment and the areas that they are struggling in.

It was discovered that connection and loadshedding were challenges that employees had to deal with. The bank should consider providing uninterrupted power supply solutions and larger data packages to all employees that worked remotely.

To lessen the growth in the number of meetings that was revealed, the bank can institute no meeting hours of the day or a no meeting day per week.

The research indicated that more focus was required from the bank on assisting employees in creating boundaries between work and personal life and navigating the emotional complexity that Covid-19 introduced. In addition, teams should be encouraged to set up weekly or monthly team chats that are set aside for social interaction and personal check-ins. This would alleviate the sense of isolation that employees are feeling.

A hybrid working model where employees work from home several days a week should be considered as it would alleviate multiple issues experienced by employees in remote working including:

- reducing the effort that struggling employees need to adapt to remote working;
- reducing the effect of connectivity and loadshedding challenges;
- assist with creating boundaries between work and personal life;
- lessen the sense of employee isolation;
- assist those employees who struggled to have a separate home workspace;
- assist teams in building trust with new team members;

- enable teams to have whiteboard discussions albeit that these need to be scheduled; and
- reduce the need for heightened management oversight and control.

6.5 Suggestions for further research

The following areas are suggested for future research:

i) Additional research extended to organisations that had implemented agile practices prior to the advent of Covid-19 and remote working, but were not necessarily technology focussed, would strengthen the findings of this research and determine the generalisability of the insights garnered by this study.

ii) There were disparate views on virtual interactions and their effectiveness compared to face-to-face interactions. Further research in quantitatively comparing the two by determining the contribution of body language to the exchange of information would clear up the disparity.

iii) A study on the continued relevance of the agile principles in remote working would support a rewrite of the Agile Manifesto.

iv) For those companies searching for new delivery approaches such as co-designing with customers in the pursuit of accelerated project delivery, a study reviewing the Agile Manifesto in this context would be beneficial.

v) Additional research that quantitatively establishes the factors that impact the productivity of the agile methodology would be thought-provoking.

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APPENDIX A: Research instrument

Section A: Biographical questions

a) Please specify which age bracket do you fall in?

   The participant's gender and race will be recorded but not specifically requested.

b) What is your highest qualification?
c) How long have you worked at the Bank?
d) What is your role in the Bank?
e) What is your role in the Agile team?
f) How many years of experience have you had with Agile?
g) How many Agile projects have you been involved in?
h) How many team members are there in your Agile team?
i) Do you have any formal Agile certifications?

Section B:

Covid-19 and Remote Working

1) How has Covid-19 influenced / affected Remote Working?
2) Can you elaborate on the above influence in terms of people, processes and technologies?
3) What are the specific challenges that this influence has introduced?
4) How has the bank addressed these challenges?

Section C:

Remote Working and Agile

5) How has Remote Working influenced the agile methodology in the bank in the context of the agile values and principles?
6) Can you elaborate on the above influence in terms of people, processes and technologies?

7) What are the specific challenges that this influence has introduced for the bank's agile methodology?
8) How has the bank addressed these challenges?
9) Have these influences had a negative influence on the efficacy of the agile methodology?

Section D:

Remote Working and Principle 6

10) How is Principle 6 of the Agile Manifesto influenced / affected by Remote Working?
11) What influence has there been on team dynamics, efficiency, communication, trust and transparency in the context of the Covid-19 and remote working influence on face-to-face communication?
12) Does Principle 6 still hold true in the new regime of Covid-19 and remote working?
13) Do you have any further discussion points on elements you feel are relevant to the research?

APPENDIX B - Consistency matrix

Objectives	Literature review	Propositions	Research questions	Source of data	Type of data	Analysis
To identify how Covid-19 has influenced remote working.	Soto-Acosta (2020); Savić (2020); Osmundsen et al. (2018); Ismail et al. (2017); Henriette et al. (2016); Zola (2014); Papagiannidis et al. (2020)	Digital transformation in the bank would be accelerated through remote working and virtualisation of offices. However, employees would feel isolated and be unable to establish boundaries between work and personal life.	How has Covid-19 influenced remote working?	Interview questions: Q1 to Q4	Nominal	Thematic analysis
To identify how remote working has influenced the agile methodology.	Mancl & Fraser (2020); Zola (2014)	The productivity of the agile methodology would be challenged by issues with collaboration, team integration and the difficulty to adhere to the agile values and principles.	How has remote working influenced the agile methodology?	Interview questions: Q5 to Q9	Nominal	Thematic analysis
To identify how Principle 6 of the Agile Manifesto has been influenced.	Lampropoulos & Siakas (2018)	Virtual interaction would have a negative influence on Principle 6.	How has Principle 6 of the Agile Manifesto been influenced?	Interview questions: Q10 to Q13	Nominal	Thematic analysis

APPENDIX C: Participant consent form

Influence of Covid-19 and remote working on the agile methodology within a South African bank

Researcher: Erwin Ching Sent, Master of Management in Digital Business, Wits Business School

I am conducting research into the influence of Covid-19 and remote working on the agile methodology within a South African bank.

I will be asking you questions based on an interview schedule that I will provide to you before the interview.

The interview will take about an hour to complete. It will be conducted via Microsoft Teams.

Your participation is entirely voluntary and you may withdraw at any time if you so choose. There is no compensation for your participation in the study.

Your identity will remain anonymous and your responses to the questions will be kept confidential.

If you have any questions, please do contact me.

Regards

Erwin Ching Sent

Participant's Name: _____

Signature: _____

APPENDIX D: 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/DB8907830E/823
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

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

Project title	The influence of Covid-19 and remote working on agile methodology within a South African bank
Investigator / Researcher	Mr Erwin Ching Sent
Nature of Project	MM (Digital Business)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	2021-08-18
Expiry date	Date of submission of the project report
Chairperson	Prof Anthony Stacey ☎ +27 11 717 3587 +27 82 880 4531 anthony.stacey@wits.ac.za

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Declaration by Researcher

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

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

Signature _____ Date: _____

APPENDIX E: Research approval letter

RE: AUTHORISATION TO CONDUCT RESEARCH:
ABSA RBB Insurance

The Influence of Covid-19 and Remote Working on the Agile Methodology

To Whom It May Concern, at

The University of Witwatersrand, Johannesburg
Graduate School of Business Administration
2 St David's Place, Parktown, Johannesburg, 2193, South Africa
P O Box 98, WITS, 2050
Website: www.wbs.ac.za

This letter is written in response to the request submitted by Erwin Ching Sent (student number 8907830E) on the **10 September 2021** who is completing his Masters of Management in Digital Business at the University of Witwatersrand (Wits Business School) to ABSA RBB Insurance, requesting permission to conduct academic research study at our organisation.

In response to the request submitted I, **Thabo Thomas Mashaba** (Chief People Officer) hereby give my permission for the study on "The Influence of Covid-19 and Remote Working on the Agile Methodology" to be conducted at Absa RBB Insurance. Permission to gather data is granted for a period of 6 months from the date of issue on this letter.

Permission to conduct the research is granted under the following conditions:

1) The research student **Erwin Ching Sent** is required to observe the rules and regulations of the organisation **Absa RBB Insurance** at all times.
2) The information observed and collected is treated as confidential.
3) The information observed and collected is only used for academic purposes.
4) The research participants' right to privacy, confidentiality and anonymity is protected at all times.
5) The research student **Erwin Ching Sent** will make the research results available to organisation **Absa RBB Insurance** upon request.
6) No company confidential information will be released publicly.
7) An alias must be given to Absa so that the company name is not used in the research report and findings.

Signature

13 September 2021

Date