Cape Peninsula University of Technology

THE EFFECT OF THE FOURTH INDUSTRIAL REVOLUTION ON EMPLOYMENT IN THE INSURANCE SECTOR IN CAPE TOWN, SOUTH AFRICA

by

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DECLARATION

I, Nosiphelo Buyana, declare that the contents of this dissertation represent my own unaided work, and that the dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date: 30 March 2023**

ABSTRACT

Introduction

Digitalisation, automation, robotics, Artificial Intelligence and machine learning have transformed the workplace. Tasks by humans are automated with higher efficiency. The 4th IR impacts business models across industries, causing disruption and mismatch between supply and demand in the workplace. New forms of employment and occupations are expected to emerge.

Problem statement

South Africa has a significant skills shortage due to failures in its education system, limiting the supply of managers, researchers and staff needed for the 4th IR. Despite the literature available on the 4th IR, there is still a gap on the effect of the 4th IR on employment in South Africa, and in the insurance sector in South Africa in particular.

Research question

- What is the effect of the 4th IR on employment in the insurance sectors?
- How can the 4th IR affect the future of work?

Aim of research

In this study, the researcher aims to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa.

Findings and conclusions

The results indicate that various factors in the form of opportunities and challenges can influence the implementation of the 4th IR in the insurance sectors. Factors such as not having the applicable skills in the company can have a negative effect on the digital transformation strategy of the company; IT infrastructure barriers limiting the rollout of 4th IR; vision and strategy as important for pursuing 4th IR transformation; and correctly implemented 4th IR has the potential to improve productivity. The majority of participants do think the implementation of 4th IR will have positive economic outcomes within the insurance sector as it will create new markets and growth opportunities and create new financial products and services, as discussed in further detail in the study.

Ethics

The study adhered to strong ethics to ensure that integrity and moral principles were followed throughout, as required by CPUT. Consent was obtained in writing from the companies as well as the research participants.

Keywords: Digital transformation, digitalisation, Internet of Things, big data, digital disruption, Fourth Industrial revolution, Artificial Intelligence, machine learning

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- I wish to extend my appreciation to the selected insurance companies who willingly participated in my research and offered essential input into the dissertation.

DEDICATION

This work is dedicated to my mother (Mandlovu) for her ongoing love and support, your prayers for me sustained me. To my late Father and Brother, I hope you are both proud of me wherever you are.

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ABBREVIATION AND ACRONYMS

4thIR	Fourth Industrial Revolution
AI	Artificial Intelligence
IoT	Internet of Things
ML	Machine Learning
Fintech	Financial Technology
DT	Digital Transformation
EQ	Emotional Intelligence
IT	Information Technology
IM	Instant Messaging
COVID-19	Coronavirus Disease 2019
RPA	Robotic Process Automation
EE	Employment Equity
RPA	Robotics Process Automation
IRS	Internal revenue service
3D Printing	Three-Dimensional Printing

GLOSSARY

Word/Term	Definition
Artificial Intelligence (AI)	"Artificial intelligence (AI) is a broad category of technologies with a number of benefits for businesses in terms of added value. Following a flood of data and a significant rise in computing capability over the past years, companies are increasingly turning to AI in order to generate economic value" (Enholm et al., 2021:23).
Data Analytics	"Data analytics is the instrument that enables data to tell stories in an understandable and straightforward way" (Rahman & Reza, 2022:228).
Digitalisation	"Digitalization focuses on potential adjustments to processes that go beyond merely converting current operations from analog to digital by switching from paper and forms" (Mergel, Edelmann & Haug, 2019: 101385).
Digital Transformation (DT)	"DT refers to organisational changes, caused by digital technologies, which lead to the redefinition of existing business capabilities, processes, and relationships" (Tijan et al., 2021:120879).
Fourth Industrial Revolution (4th IR) .	"4th IR refers to the current trend of intensive process automation and large-scale data collection, analysis, and communication" (Shaturaev, 2022:51).
Internet of Things (IoT)	"The Internet of Things (IoT) is a dynamic global network infrastructure with self-configuring capabilities built on open, interconnected communication protocols, where physical and digital "things" have identities, physical characteristics, and digital personalities, employ intelligent user interfaces, and are seamlessly incorporated into the information network" (Friess & Ibanez, 2022:4).
Machine Learning (ML)	"Machine learning (ML) is a model that seeks to identify the unidentified structure, relationship, or function between input and output data, usually, these relations are difficult to be existed by explicit algorithms via automated learning process" (Kwekha-Rashid, Abduljabbar & Alhayani, 2021:10).

CHAPTER 1: INTRODUCTION

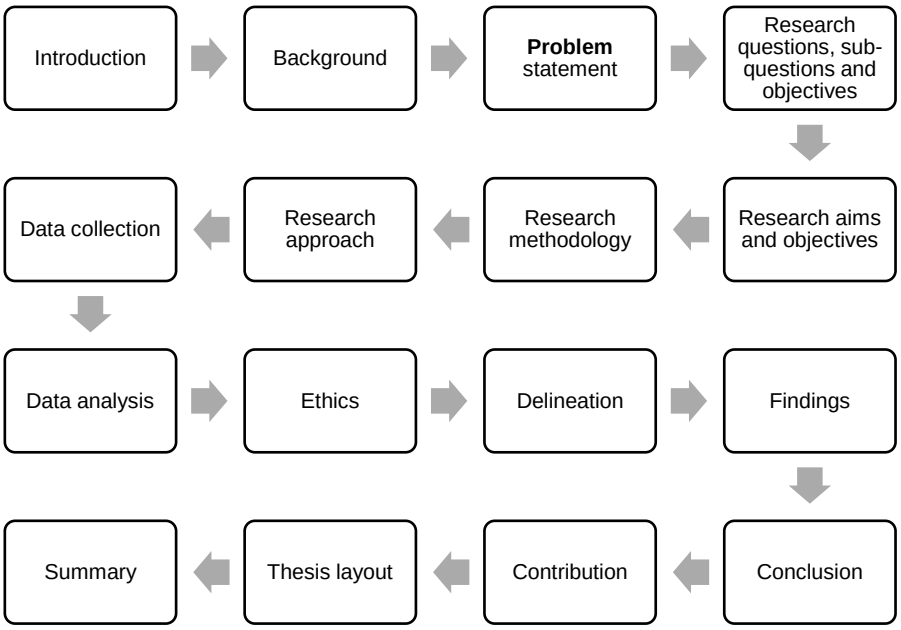

Figure 0.1: Layout of Chapter 1

Introduction

The Fourth Industrial Revolution (4th IR), defined by Klaus Schwab, creator, and executive chairman of the World Economic Forum, portrays a world in which "people use connected technology to enable and control their lives as they travel between digital domains and offline realities" (Miller, 2016:3). The 1st Industrial Revolution transformed the economy from one based on agriculture and manual labour to one based on industry and machine production. During the 2nd Industrial Revolution, oil and electricity aided mass production. Information technology was utilised to automate production during the 3rd Industrial Revolution. Although each era is often thought of as a distinct event, the events should be viewed as a succession of events that build on previous revolutionary ideas and lead to more advanced forms of production (Xu, David & Kim, 2018:92). This research investigates the effect of 4th IR on employment in the insurance sectors (Figure 1.1).

The 4th IR is the current epoch in which countries all over the world are embracing game-changing technologies such as AI, robotics, cloud computing (CC) and the Internet of Things (IoT) (Dwolatzky & Harris, 2021). Most importantly, none of these technologies are considered in isolation in the 4th IR ecosystem. Instead, it encompasses a fusion in which these high-powered technological tools integrate with the

physical and biological worlds. As the generation of young people who have grown up in a world of computers, the internet and digital communication, so does the generation that brings with it new patterns of consumption and different ideas about how to buy and use goods and services (Moavenzadeh, 2016). This marks the rise of a new generation of innovative companies that are willing to create entirely new markets for themselves or take drastically different approaches in developed areas.

It is well known that jobs will be affected when diverse tasks are automated by artificial intelligence (AI). Artificial intelligence will alter many jobs, and new employment will be generated that will promote economic growth. With these jobs, employees will have more time for complex, collaborative and original problem-solving tasks. The bad news is that workers who are semi-skilled, unskilled or illiterate will be at a disadvantage when the 4th Industrial Revolution occurs. By providing training for jobs that will be required in the future, businesses and the government must adjust to the changing nature of work. Despite industries promising job stability, many manual employees have been laid off as a result of system improvements. Many jobs no longer have a purpose or meaning, and they no longer provide security. It is obvious that the way we do business in the future and how we interact with each other will change (Phushela, 2020).

Background

The 4th IR has become a popular issue in South Africa, affecting all sectors. President Cyril Ramaphosa's speech at the first South African Digital Economy Summit on 5 July 2019 emphasised the importance of "harnessing" the opportunities offered by the digital revolution to i) improve economic transformation and job creation; ii) improve our education outcomes and skills revolution and ensure a healthy nation; iii) consolidate the social wage through reliable and quality basic services; iv) improve spatial integration, human settlements and local government; v) enhance spatial integration, human settlements, and local government settlements and local government; vi) advance social cohesion and safe communities; vii) create a capable, ethical and developmental state; and viii) work for a better Africa and World (Khan et al., 2021:23).

The 4th IR is changing how products are imagined, manufactured, distributed, acquired and consumed (Nwaohiri & Nwosu, 2021). It impacts how businesses operate and what customers, employees and society expect of them, and disruptions with a significant impact on employment. According to Eiser, Mayet and Johnson (2020), "there will be a decline in positions such as telemarketers, legal clerks, rental clerks, cashiers, and tellers in the business

services industry". On the other hand, there will be a rise in positions such as AI and machine learning specialists, trainers for human machine integration, and travel agents that prioritise the traveller's experience (Zervoudi, 2020). Workers may be at danger of automation for a number of reasons. One reason is a lack of work experience, which largely affects young, untrained individuals doing repetitive tasks that might be readily mechanised. It is anticipated that new job categories and professions may arise, partially or completely displacing current ones (Smith & Pourdehnad, 2018).

Problem statement

The 4th IR introduces dynamic developments that will have an "impact on organizations, people, and their working environments, causing upheaval in society, the economy, and industry" (Mayer, Wegerle & Oosthuizen, 2021:3857). Tasks previously performed by humans have now been taken over by high efficiency automations (Schwab, 2017). The 4th IR brings opportunities and serious risks at the same time. Opportunities are new technologies which can process information more quickly, which can assist in driving economic growth, empower individuals, drive entrepreneurship, and enhance health care. Risks are new technologies which bring a significant risk, especially in terms of cybercrime, personal information and employment. While new technologies have the potential to create new jobs, they can be used to replace existing ones (Eiser et al., 2020). McKinsey Global Institute estimates that robots and intelligent agents could replace approximately 30% of the world's current human labour by the year 2030 (McClelland, 2020).

The threat of the 4th IR is that businesses, workers, schools and governments will not pay heed to the indicators of unemployment and a lack of skilled labour. There is no need to accept the grim employment outlook. Business needs to develop strategies for re-training large segments of the population, more sustainable business models, and incentive schemes between the private sector and the public sector. Over the next ten years and beyond, these breakthroughs have the potential to significantly increase the productivity, reach, scalability and profitability of practically every sector. Businesses may increase productivity, save costs and raise the calibre of their goods and services. These advancements can help both consumers and companies. Employees who have had such roles in the past will also be at a major disadvantage unless they can find new employment with a comparable wage. The economy, politics and financial markets and many other sectors may be significantly impacted by this seemingly little component of employment attrition over time (Wandering, 2020).

"There are substantial skills shortages in South Africa as a result of educational system failings, restricting the supply of managers, researchers, and personnel needed for 4th IR. There are also issues with insufficient infrastructure, indicating weak governance and state

capture" (Sutherland, 2020:236). The 4th IR will have a significant impact on South African businesses, particularly during and following the COVID-19 pandemic (Ngcobo, 2020). Despite improvements to the digital infrastructure during the COVID-19 situation, South Africa is still a long way from fully embracing the 4th IR. South Africa lacks numerous resources for implementing and managing the 4th IR, including skilled technology professionals and technological infrastructure.

Despite the literature available on the 4th IR there is still a gap on the effect of the 4th IR on employment on the insurance sector in South Africa.

Research questions, sub-questions and objectives

In Table 1.1, the research problem, questions, methods and objectives are presented.

Table 0.1: Research problem, research questions, research sub-questions, research methods and objectives of the questions

Research Problem	**Despite the literature available on the 4th IR there is still a gap on the effect of the 4th IR of employment on the insurance sector in South Africa.**		
Research Question	**RSQ 1: What is the effect of the 4th IR on employment in the insurance sectors?**		
	Question	**Objective**	**Method**
SRQ 1.1	How are employees in the insurance sector ensuring the relevance of their skills within the context of 4th IR?	To determine the skills needed by the employees to work in the 4th IR environment	Exploring cases using semi-structured interviews
SRQ 1.2	How is the 4th IR transforming businesses?	To determine ways the 4th IR will transform the business	Exploring cases using semi-structured interview
SRQ 1.3	What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation?	Challenges employees will face because of the 4th IR	Exploring cases using semi-structured interviews
SRQ 1.4	How can the skills needed for the 4th IR be determined in the insurance sector?	To determine the skills needed for the 4th IR in the insurance sector	Exploring cases using semi-structured interviews
Research Question	**RSQ 2: How can the 4th IR affect the future of work?**		
SRQ 2.1	How does your organisation determine the characteristics and skills required for the 4th IR?	To determine characteristics and skills required for the 4thIR	Exploring cases using semi-structured interviews
SRQ 2.2	What are the challenges of the 4th IR in the insurance sector?	Challenges of the 4th IR faced by insurance sector	Exploring cases using semi-structured interviews

*RQ: Research question; SRQ: research sub-question

Research aims and objectives

1.1.1 Aim of study

The aim of the study is to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa.

To address the above aim, the objectives are to discover challenges that may be caused by the 4th IR on employment in the insurance sector in Cape Town.

1.1.2 Objectives

i. To determine the emerging threats and opportunities that will influence engagement with the future of the 4th IR in the insurance sector.

ii. To evaluate the progress and failures related to 4th IR employment in the insurance sector.

iii. To determine challenges (critical issues) that may be caused by the 4th IR on employment in the insurance sector.

Research methodology

1.1.3 Introduction

Research methodology, according to Dawson (2019:36), "is the main premise that will govern your research". It becomes your broad research strategy and dictates the research methodology employed for a study. A research methodology is distinct from a research technique since the former refers to the instruments used to obtain data. It demonstrates how the researchers develop the problem and objectives, and how the findings are presented based on the information gathered throughout the research period (Sileyew, 2019:9).

1.1.4 Research philosophy

"A framework that governs the conduct of research based on concepts about reality and the nature of knowledge" is a *research philosophy* (Collis & Hussey, 2014:298). A research philosophy is "a system of the researcher's ideas, based on which fresh, trustworthy information about the research object is acquired" according to Holden and Lynch (2004:397). In other words, it serves as the foundation for the study, which entails selecting a method; defining an issue; and gathering, processing and analysing data. In turn, the paradigm of scientific investigation is made up of ontology, methodologies and epistemology.

Ontology

i) Objectivism

Objectivists believe that "social phenomena and their meanings exist independently of social actors" (Bryman & Bell, 2011:20; Saunders et al., 2012:130) This strategy was not chosen for this research since it is social in character and necessitates the use of social methods.

ii) Subjectivism

Subjectivity is typically understood as the extent to which a researcher's opinions, values, social experiences and point of view impact a study. Traditional scientific terminology links subjectivity and personal biases because it emphasises empirical research and contends that any influence the researcher may have had on the collection, management, interpretation and reporting of data invalidates the conclusion (Ratner, 2008:265).

Because this research used qualitative rather than quantitative data which are unstructured and not dependent on numbers, the subjective method was adopted.

Epistemology

i) Positivism

“The focus of *positivism*, which emerged in the natural sciences, is on obtaining logical or mathematical evidence that results from statistical analysis as well as testing hypotheses scientifically” (Collis et al., 2014:300). Therefore, “positivists frequently provide exact, objective, and quantitative data using high sample sizes” (Collis et al., 2014). The positivism approach was not chosen for the study.

ii) Interpretivism

Interpretivism is the result of the inability of the positivist approach to satisfy the needs for more rich data to explore and understand the phenomenon under investigation (Collis et al., 2014). Interpretivism has at its heart the empathetic awareness of how participants see the world so that the researcher can explore and understand the complexity of social ecosystem (Bryman & Bell, 2011; Saunders et al., 2012). It further allows for a smaller sample size to make the research practical and manageable (Collis et al., 2014:50).

The interpretivism method was selected for the research study since data from the participants contributed to the development of the study's argument.

1.1.5 Research approach

Deductive

The development of a hypothesis (or hypotheses) based on an existing theory, followed by the development of a research plan to test the hypothesis, is what a *deductive method* is all about (Wilson, 2014:7). According to Gulati (2009:42), “deductive reasoning is the process of

going from the specific to the broad. If a theory or case study seems to imply a causal relationship or correlation, it may be accurate in many instances. To determine whether this relationship or link does exist under more general conditions, a deductive design may be used".

Abductive

According to Bryman et al. (2022:27), using an *abductive* research methodology, the research process begins with "interesting facts" or "puzzles" and is committed to their explanation. When a researcher comes upon an empirical phenomenon that cannot be explained by the current pool of hypotheses, "surprising facts" or "puzzles" may arise.

Inductive

"Deductive and inductive techniques have flaws, which the abductive approach is designed to overcome. Deductive reasoning is specifically attacked for being unclear about how to choose the theory to be tested by creating hypotheses". While deductive reasoning is challenged because "no number of empirical facts will definitely permit theory-building, inductive reasoning is not" (Saunders et al., 2012:146).

The interpretivism, intrinsic approaches of qualitative research, and inductive analytical methodologies have led to the selection of an inductive approach as the best strategy for attaining the study's goals.

1.1.6 Research strategy

A multi-case study design was chosen as the research approach. Two organisations were purposefully, conveniently and non-randomly chosen. The financial industries in Cape Town served as the primary selection criterion.

The study's data gathering method of choice was interviews, coupled with semi-structured interviews, to enable direct information extraction from participants who are experts and managers in the fields of technology and human resources. Two (2) organisations will be used as cases. Because there is little literature on the phenomenon being examined, an experimental approach was employed. While giving experts the flexibility to communicate their expertise and views, the respondents were questioned using a semi-structured format to serve as the basis for discussions with the two (2) organisations. Due to the exploratory and evaluative character of the study, the method was centred on acquiring data for qualitative analysis (Yang et al., 2018:820). In a non-random, purposeful and convenient sample process, managers and technology specialists working in the financial sector were chosen as respondents.

Unit of analysis

The unit of analysis was the effect of the 4th IR on the employment of in the insurance sector in Cape Town, South Africa.

Unit of observation

From the unit of analysis, information about the phenomena under research is gathered (Ary et al., 2018). The following individuals inside the organisations served as the non-random, purposeful and handy sources of the data as the unit of observation: five department heads, three managers, a solution architect and three operations staff.

1.1.7 Sampling

Sampling is the process of choosing a "group of individuals from a selected demographic who will be interviewed in research" (Bryman, 2016:174). The participants (12) were non-randomly, purposively and conveniently selected.

Data collection

Data was gathered by means of face-to-face interviews and via MS Teams. A semi-structured interview guide was used to conduct the interviews (Appendix B). The duration of the interviews was 30 and 45 minutes. The interviewees' data were recorded and then transcribed. The interviewees received the transcriptions back to check and confirm their accuracy and content. The participants gave written consent for each interview to be recorded.

Data analysis

The research was of a qualitative character (Yang et al., 2018:835). For the obtained data to be valuable information for the research, the collected data must be divided into smaller parts through a data analysis process. The collected data was keyworded, identified, coded, summarised, categorised and finally, underwent a thematic analysis.

Ethics

A democratic ethics paradigm of justice, equity and fairness is suggested by Simons (2009:26). The model's interactions stress the three key ideas of secrecy, discussion and availability. Confidentiality guarantees data reliability, trustworthiness and validity. In negotiations, non-harmful research is consulted. Accessibility is the requirement for quick data communication (Simon, 2009:26).

The following principles were adhered to during the research:

i) *Autonomy:* Participants were assured that their names would remain anonymous and that any information they supplied would be kept private.

ii) *Beneficence:* A benefit to the research participant. This was explained before the interview to the participants.

iii) *Non-malfeasance:* Avoiding harm. The Ps were made aware that they could, at any time during the research process, withdraw from the research without any condition applicable to the withdrawal.

iv) Justice: Particularly noteworthy is distributive justice, which ensures that communities share benefits and risks equally.

v) *Ethical practice in relation to research colleagues:* Interviewees were assured that all information and support sources would be acknowledged, and that the researcher would not utilise the results for personal advantage. The participants voluntarily participated and so could withdraw at any point.

vi) *Ethical practice in relation to research participants:* The study's goal and the planned research were made apparent from the beginning. The organisation and each interviewee had given their consent for the research to utilise their insights. Research was undertaken with integrity, clarity, thoroughness and responsibility.

vii) *Anonymity:* The research treated all the respondents as anonymous. The research did not identify any participants in any way. The research findings were disseminated for peer review to validate responses.

viii) *Ethical practice in relation to the environment:* The study did not cause physical or emotional harm to any participants.

ix) *Access:* The research acknowledges society's right to prompt access to all study results, which are subject to discussion on any implications and ethical practice in respect to South African society. This study intends to benefit the insurance industries in South Africa.

Delineation

No other financial services providers other than the two insurance companies were used for this research. The companies are in Cape Town in the Western Cape of South Africa.

Headline findings

Headline finding 1: There is a lack 4th IR skills and capabilities in the Fintech industry.

Headline finding 2: It is acknowledged that both businesses need the 4th IR to be competitive and relevant in the present economic climate.

Headline finding 3: Businesses over-automate to achieve tighter margins, replacing the human touch.

Headline finding 4: There is still gap between the real and digital worlds in the Fintech space.

Headline finding 5: Correctly implemented 4th IR has the potential to improved business productivity.

Conclusion

Managers are trying to comprehend the 4th IR, to understand the principles, and to see how these principles apply to their day-to-day managing tasks and operations. Despite serious efforts in the Fintech industry, there is still a lack of understanding, implementation and optimising within the industry for the 4th IR. One of the main factors affecting this is the lack of skills and capabilities of the current workforce. There are important areas of risk in the changing nature and volume of employment. The automation that comes with the 4th IR reduces human involvement in numerous areas such as accounting, bookkeeping and other administrative positions. The main growth in employment will be in jobs in science, technology, engineering, HR practitioners, data analysis and computer science.

Contribution

This research focuses on the effect of the 4th IR on employment in the insurance sector by examining its functions, problems, prospects and benefits. The aim of the study is to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa.

The research contributes both practically and theoretically to the current knowledge as it sought to garner insight into effect of 4th IR on employment in the insurance sector. Although this study cannot be generalised, its findings can be used to establish the most appropriate strategies for future implementation of the 4th IR. The study can also be used as a source of knowledge as well as guidance on processes that can be utilised to achieve organisational success. The study will also contribute to the skill sets and employability of resources for the 4th IR.

Summary

In order to fulfil client wants and needs, as well as remain competitive in ever enlarging markets and as a result of digital technology, many businesses are pressured to adapt. The main aim of the study is to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa. The objectives are as follows: i) To examine the emerging threats and opportunities that will influence engagement with the future of the 4th IR in the

insurance sector; ii) To analyse the progress and failures related to 4th IR employment in the insurance sector; and iii) To determine challenges (critical issues) that may be caused by the 4th IR on employment in the insurance sector.

To answer the research questions, an inductive approach was chosen. Two insurance industries in Cape Town were studied using case study methodology. Semi-structured questionnaires were used to gather data which were then analysed by summarising, categorising and theme analysis. Ethics adhered to while undertaking the research were described. The chapter concludes with the definition and contribution of the research after presenting five headlines.

Chapter 2 presents the literature review

CHAPTER 2: LITERATURE REVIEW

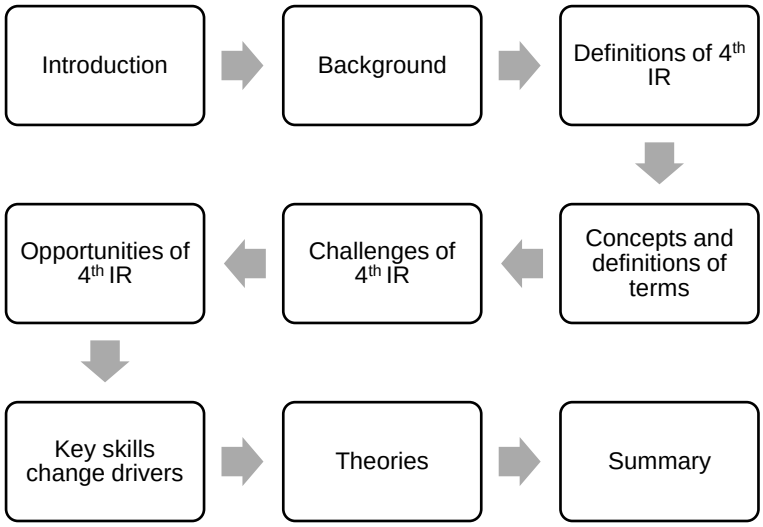

Figure 0.1: Layout of Chapter 2

Introduction

Businesses across all industries are being profoundly impacted by the 4th IR and technological innovation, with machines taking centre stage. Employers can accomplish more with less by adopting cutting-edge platforms and technologies like artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing and more, all of which impact labour markets and the workforce. In this instance, certain business processes and the personnel involved have in many instances been replaced by machines (Perrin, 2021). This is because high-skill machinery and computers have replaced low-skill workers, making them a business's primary asset rather than its labour force. Businesses can now automate procedures, gather and analyse huge amounts of data, and transform that data into insights that can be used. As a result, business models, customer experiences, services, new product development and company operations and procedures are all improved. Each of these factors influences how the organisation functions and has the power to determine success or failure. Businesses must use the appropriate technology to meet their demands, objectives and goals because there are so many methods to use this technology (Perrin et al., 2021)

Pattie (2016) discusses how the 4th IR has affected employment and the work of non-profit and community organisations, as well as what new challenges and possibilities these developments may bring to these organisations. Automation offers several chances to increase efficiency, but it also impacts the skill sets needed by financial institutions, perhaps further entrenching the "low-pay skill" and "high-pay skill" labour divisions that already exist (Phushela et al., 2020).

An extraordinary public health emergency, the COVID-19 pandemic, has resulted in enormous losses in employment and economic activities. It is obvious that the pandemic is influencing the faster adoption of 4th IR automation technologies even as the world struggles to contain the infection and stop the economic haemorrhage. This acceleration might occur unevenly across industries and take unanticipated forms, having an influence not just on the manufacturing industry but also on white-collar positions in front- and back-office settings. Many claim that these changes will be permanent, which would make the banking sector's post-pandemic job recovery more difficult given that more 4th IR automation is itself predicted to diminish aggregate demand for labour in the short-term (Karr, Loh & San, 2020).

The literature review was done using keywords and concepts from the problem statement, research questions and aim of the study. The keywords used were 4th IR, impact of 4th IR on people and businesses, 3-D Printing, AI, employment and IoT. These keywords were used to search the literature in the following databases: Google Scholar, Research Gate and the CPUT Online Library. The literature section (Figure 2.1) is divided as follows: i) background of 4th IR, ii) definitions, iii) concepts and definitions of terms; iv) effect of the 4th IR on organisations and workforce; v) impact of 4th IR; vi) opportunities and challenges of 4th IR; and vii) key skills and change drivers.

Background of the 4th IR

“We are on the cusp of a technology revolution that will drastically change how we interact with one another, live, and work. The shift will be unlike anything humans has ever encountered in terms of magnitude, breadth, and complexity” (Schwab,2019). Another industrial revolution is about to begin, and the norms of change and transformation are being revised. The new 4th IR is described as a fusion of technologies that blur the boundaries between the physical, digital, biological and neurotechnological domains (Dlamini, 2016).

According to Wandering et al. (2020), the economic dynamics of the workforce and the employment that will be eliminated distinguish the 4th IR from the previous revolution. Previous revolutions brought about gains in production, employment and salaries, all of which were beneficial to workers. Most technological advancements were additive; thus, people just needed to be re-trained to do new duties. Most task-based professions in both blue-collar and white-collar occupations can be greatly automated in the 4th IR, though. So, workers must thus be aware that they could be entirely replaced in the 4th IR since those with irrelevant skills will go from being jobless to entirely unemployable.

The 4th IR, which is distinguished by a variety of new technologies that are fusing the physical, digital and biological worlds and impacting all disciplines, economies and industries, is fundamentally different from the previous revolutions, according to Schwab (2016).

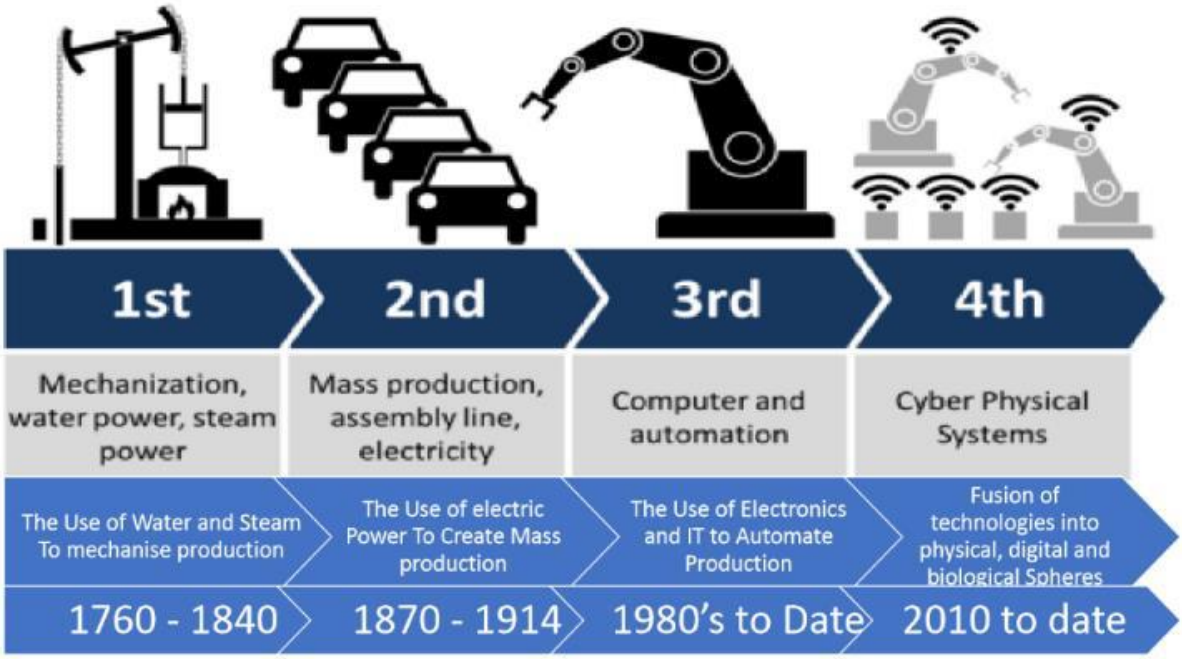

Figure 0.2: Stages of the 4th IR (Khumalo 2018:5)

According to scholars, the 4th IR (Figure 2.2) comes after the first three (Schwab et al., 2016; Khumalo 2018). However, as the debate that follows shows, there are varying views on how long each of these phases should last. The steam engine technology that enabled mechanical manufacturing was at the centre of the 1st Industrial Revolution, which lasted roughly from 1760 to 1840. The development of rail transportation automated the work of horses and carriages (Schwab, 2016). This was the first time that employment was mechanised, and it may have been the first time that widespread job displacement occurred. Around 1870, the 2nd Industrial Revolution started, lasting into the 1940s (Schwab, 2017). In essence, mass manufacturing began with the development of electricity. When the conveyor belt mechanism supplied mass-market items, automation took over the tasks that had previously been completed by hand-held equipment. From about the 1960s through 2010, there was a 3rd Industrial Revolution (Schwab, 2017). Semiconductors, mainframe computers, personal computing and the internet were the primary forces behind this development, dubbed the "computer revolution" (Rusli et al., 2021). Robotics were introduced into companies during the 3rd Industrial Revolution, further eliminating manual labour. The 4th IR goes beyond digitisation

by integrating "new technologies that are linking the physical, digital, and biological worlds and having an influence on all disciplines, economics, and sectors" (Khumalo 2018:4). The 4th IR is changing all facets of life as we know it, according to Schwab (2017). Instead of asking whether global industries will be disrupted, it is now more important to ask *when* the disruption will occur, what form it will take, and how it will affect individuals and organisations. Consequently, all nations must prepare for the physical manifestations of the 4th IR, which include "autonomous cars, 3D printing, sophisticated robotics, and novel materials" that are predicted to reshape the globe (Schwab, 2017:20). To prepare for the transition, we must accept the fact that jobs are being automated out of existence, more with every industrial revolution, even though this one, the 4th, is touted as having exponential automation. The main issue is whether earlier industrial revolutions produced more employment than they eliminated. According to Moore's Law, change will occur at an exponential rate (Baldwin, 2019). "The velocity of data is related to this speed, and data is processed at an appropriate and amazing pace" (Gentsch, 2019).

Definitions of the 4th IR

There were several definitions for the 4th IR in the literature. Table 2.1 presents several of the definitions.

Table 0.1: Some definitions of the 4th IR

Authors	Definitions of the 4th IR
Timm and Lorig (2015:99)	"The behaviour of each individual actor depends on the actions of other actors in the 4th IR, which consists of autonomous subsystems. These autonomous systems communicate with one another in order to accomplish their own objectives as well as those of the other parties involved. Robotics and other automated technologies are thereby replacing operations that once required human labour for operation and decision making".
Schwab (2016:156)	"Combination of technologies blurring the lines between man and machine".
Lee et al. (2018:21)	"The utilisation of information and communications technology (ICT) defines the 4th IR. ICT is widely employed by organizations in industry, government and civil society. ICT uses hardware and software from computers to carry out tasks. When ICT flourishes throughout all industries—namely, the primary, secondary and tertiary industries—there is thought to be a dramatic transformation known as 4th IR".
World Economic Forum (2016)	"The 4th IR expands on the digital revolution by illustrating new ways in which technology is ingrained in society and even the human body. Cyber-physical systems have an impact on today's industrial revolution and are included into its production methods. Unlike previous evolutions, this revolution incorporates the physical, digital, and biological aspects; it does so exponentially, amplifying its effects and necessitating the change of production, management, and governance systems".

Xu et al. (2018:90)	"The 4th IR introduces dynamic developments that will have an impact on organisations, people, and their work environments, causing upheaval in society, the economy, and industry."
Mergel et al. (2019:12)	"Is a comprehensive attempt to modify key government services and procedures outside of the conventional digital initiatives. It progresses along a continuum from analog to digital, to a full-stack evaluation of user demands, existing procedures, and rules, and ultimately leads to a comprehensive revision of the present and the creation of new digital services. The success of digital transformation activities is dependent on, among other things, meeting user requirements, developing new service delivery models, and growing the user base".
McGinnis (2020:11)	"The blurring of physical, digital, and biological barriers is referred to as the 4th IR. It was developed using a combination of technologies including artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing, and others. It is the impetus behind a plethora of goods and services that are swiftly emerging as essential in the modern society. Think of tailored Netflix recommendations, voice-activated virtual assistants like Apple's Siri, and Facebook's ability to identify your face and tag you in a friend's photo".
Fox and Signé (2021:51)	"4th IR is the next phase in the digitisation of the manufacturing sector, driven by four disruptions: the astonishing rise in data volumes, computational power, and connectivity, especially new low-power wide-area networks; the emergence of analytics and business-intelligence capabilities; new forms of human machine interaction such as touch interfaces and augmented reality systems; and improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D printing."
Deloitte (2020:4)	"4th IR relates to the fusion of physical assets and cutting-edge digital technologies, including the internet of things (IoT), artificial intelligence (AI), robots, drones, autonomous vehicles, 3D printing, cloud computing, nanotechnology, and more that communicate, analyse, and act upon information, enabling businesses, consumers, and society to be more flexible and responsive and to make more intelligent, data-driven decisions".
Dwolatzky and Harris (2021:28)	"4th IR is the current epoch in which countries all over the world are embracing game-changing technologies such as AI (AI), robotics, cloud computing, and the Internet of Things (IoT). Most importantly, none of these technologies are considered in isolation in the 4th IR ecosystem. Instead, it encompasses a fusion in which these high-powered technology tools integrate with our physical and biological worlds."
Benyera, (2021:200)	"The 4th IR, which uses digital technology to expedite the automation of traditional industrial and manufacturing processes, will further marginalize Africa in the global world".

Definitions of concepts

1.1.8 Introduction

According to Schwab (2016:6), the word *revolution* denotes an abrupt and drastic transformation. The 1st IR began in "1760 and was distinguished by its own unique needs in terms of human resources", as the other revolutions (Xu et al., 2018:90). Revolutions are not a new phenomenon in the history of humankind and have occurred when new technologies

are developed and perceived to have the potential to cause abrupt and profound changes in economic systems and social structures.

Even while technology may have a positive effect on economic growth, it is also important to address any potential negative effects on employment. Concerns about how technology will affect work are nothing new. The factors that will cause the new technology revolution more confusion than the previous industrial revolutions include speed (everything is happening much more quickly than ever before), breadth and depth (so many radical changes are happening at the same time), and the total transformation of entire systems. Given these motivating considerations, one thing is certain: new technologies will fundamentally alter the nature of labour in all sectors of society and professions. The main area of uncertainty is to how much labour will be replaced by automation.

Understanding the two opposing effects that technology has on employment is essential. First, there is a destructive effect as automation and disruption fuelled by technology replace labour with capital, compelling employees to re-purpose their talents or lose their jobs. Second, this destruction impact is followed by a capitalisation effect, in which there is a rise in demand for new products and services, which results in the emergence of new jobs, businesses and even whole new industries.

1.1.9 Employment

Employment is a contract recognised by the government that outlines the duties, payment conditions and workplace regulations between a person and another institution. Employment is the concept that a person has made a verbal or written agreement with a party known as the ‘employer’ under specific terms, such as compensation and schedule (International Labour Organization, 2004:17).

Heathfield (2020:114) describes *employment* as,

> *an agreement between the employer and the employee to provide certain services to the employee. The employee will be compensated in return with a salary or hourly wage. The terms and conditions of an employment agreement are primarily decided by the employer, even though employees can bargain some items. The agreement may also be terminated by both parties.*

1.1.10 Mobile internet

Thanks to faster and less expensive internet access, more capable mobile devices, internet-enabled mobile devices are no longer a luxury for a small number of people but have instead become integrated in the lives of billions of people who now possess Smartphones and tablets (Manyika et al., 2013). These sophisticated gadgets feature sensors that readily exchange

data with other gadgets or the cloud through the internet, improving the world's effectiveness, security and general quality of life (Patel, Shankuan & Thomas, 2017). Users can observe, comprehend and even interact with the physical world in new ways during their daily activities thanks to ubiquitous connectivity and the proliferation of apps (Manyika et al., 2013). At the same time, innovators are enabling increasingly complex IoT technologies like drone delivery services, self-driving cars and other cutting-edge applications (Patel et al., 2017). Mobile devices have replaced traditional office equipment as more workers desire the freedom to use their own equipment at work. As a result, companies need to change to manage the most recent mobile technologies.

1.1.11 Artificial Intelligence

The capacity of robots to exhibit knowledge in thinking and behaviour that resembles and surpasses that of humans is known as *artificial intelligence* (AI). This has to do with the computer's capacity for perception, learning, interaction and decision making. Computers can use a set of techniques called "machine learning" to solve problems by themselves (Mueller & Massaron 2019:9). But neither a single technology nor a group of specialised applications is the driving force behind this. Instead, a wide range of technologies are now associated with AI (Valcke, 2021).

“AI is a wide-ranging branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence” (Schroer, 2022:1). AI makes it possible for robots to mimic human mental powers. AI is becoming more useable and important in the daily life of people. The rise of smart assistants such Siri and Alexa to the development of self-driving automobiles are all steps towards an AI ecosystem. As a result, numerous IT firms in a variety of sectors are investing in AI.

1.1.12 Cloud computing

According to Aldahwan and Ramzan (2022), cloud computing is the use of computer resources that are centralised in one or more data centre locations and owned and operated by a third-party provider. On-demand provisioning and pay-as-you-use resource billing, both with minimum up-front costs, are what set cloud computing apart. Cloud computing services also save capital expenditures, convert operating costs into real usage, and reduce manpower costs. It functions as a platform and a particular sort of application for giving out computer infrastructures and services.

With the cloud, companies can store their resources on the internet, digitally. Additionally, cloud technology can deliver other services aside from data storage, which are servers, networking and software that are digitally stored on remote storage, databases or servers and

accessed by internet-capable electronic devices (Frankenfield, 2020). The presence and growth of digitalisation and digital transformation have been ever-present, from business solutions and government support. Hence, there is also the growth of digital data and information.

Cloud computing is the supply of on-demand computer services through the Internet, including applications, storage and processing. The usage of multiple apps and resources, as well as information interchange and everyday activities such as business and daily life, have all previously been impacted by cloud computing technology. As a tool, clouds will not only make it easier to communicate with people around, but they will also enable us to gather data, analyse it, compute it, and carry out tasks that are currently impossible to comprehend or even envision (Tautvydienė & Morkevičienė, 2019).

1.1.13 Robotics

Since this revolution, robotics and robots have developed significantly, turning science fiction into a reality. Robots are rated according to how well they have grasped human skills. Robots learn "natural language awareness" or the capacity to grasp language and complex human interaction through communication skills (Baldwin, 2019:154). Although artificial intelligence (AI) is praised for being extremely near to human intelligence, robots still cannot think of varied and innovative ideas or grasp context in addition to content (Durrant, 2018).

Humans are sometimes described as social creatures with emotional intelligence and the capacity for empathy. In contrast, robots lack the capacity to recognise the context of a situation, making them effectively "socially tone-deaf" (Baldwin et al., 2019:158). The advancements achieved in mechatronics, electrical engineering and computing are the foundation for robotics (Perez & Vélez-Jaramillo, 2021).

1.1.14 3D printing

The method of creating goods utilising additive manufacturing, as Chow-Miller (2017:9) mentions, is described. Numerous industries, including those that make cars and provide healthcare, have used this new technology extensively for a variety of uses. Making airplane components and artificial organs out of human cells are two applications for 3D printing. Although it has undergone several advancements, this technology has been in use since the 1980s. However, the technology has just really taken off in recent years.

Akileswaran and Hutchinson (2019:2021) claim that,

> *3D printing might endanger manufacturing by fragmenting the sector and enabling African businesses to start producing without the prior high investment need. On the other hand, hubs of 3D activity may develop closer to the demand in high-income nations. The job opportunities for*

low-skilled workers that light manufacturing formerly offered will be threatened as the need for highly trained, design-related labour will increase and the demand for low-skilled labour in production and assembly will decline.

Effect of the 4th IR on organisations

As new technologies proliferate in the economy, culture and industry, these developments have had a big impact on how people live their lives and work. According to Brondoni and Zaninotto (2018:2), the 4th IR "has compelled enterprises to change their old business and organizational paradigms". As a result of the 4th IR, which provides more flexibility and on-demand work, the labour market will be altered. Hirschi (2018:197) also mentions "employment losses, profession changes, and the formation of new vocations, all of which result in a shift in power, money, and expertise".

The 4th IR has introduced new employment equity (EE) policies in South Africa, which will control the repercussions of this transformation (Oosthuizen & Mayer, 2020:2829). Oosthuizen and Mayer (2019:2) assert that to increase manager adaptability, employability and appropriateness in today's workplace, "job mobility, consent re-training, and rotation" are necessary. EE adaptation is necessary to consider the changing work environment.

1.1.15 Impact on employment

According to Balakrishnan (2022), insurance providers are modernising their operations and adopting digital procedures to improve the policyholder experience, boost productivity and gain a competitive edge. The COVID-19 pandemic increased the demand for new, digital-first business solutions in the industry, even though many organisations in the field were already looking for new ways to use technology to rethink their operations. Many new insuretechs start-ups are coming up with innovative ways to produce substantial results throughout the insurance value chain. There has also been a rise in enthusiasm for technology accelerators with an insurance-specific focus. Blockchain, robotic process automation (RPA), artificial intelligence (AI), machine learning, augmented reality (AR), and other emerging technologies are being used by insuretechs to adopt new, interconnected strategies made possible by the Internet of Things (IoT) and linked devices.

1.1.16 Divided labour forces

While worries of job losses due to robots taking over duties are commonly connected with technological revolutions, the 4th IR's traits of high automation and connectivity may increase the productivity of current employment or spur demand for whole new professions (Baweja et

al., 2016). It is estimated that between 35 and 50% of current occupations will be automated soon (Marr, 2017). As severe automation takes hold, low-skilled occupations will likely continue to shrink, while a growing number of middle-skilled positions will become vulnerable (Baweja et al., 2016). Even professionals such as service providers, diagnosticians and paralegals will be vulnerable to these shifts (Marr et al., 2017). As data and talent quickly become the most valuable inputs for businesses, cities globally can encourage their own in house innovation ecosystems to quickly benefit from the new efficiencies enabled by the 4th IR and meet the needs of their citizens while also producing desired services and products for global markets (Davis, 2015).

1.1.17 Impact on governments

As the digital, physical and biological domains continue to collide, new platforms and technologies will progressively empower common people to connect with governments, direct their efforts, voice their feelings, and even bypass the authority of public institutions. These authorities will simultaneously acquire new technical skills that will enable them to exert more control over populations through pervasive surveillance systems and the power to alter digital infrastructure (Schwab et al., 2016). Balkaran (2017) demonstrates that earlier technological revolutions occurred when governments embarked on daring missions, concentrating on boosting innovation rather than reducing government failure. However, as their essential functions are reduced owing to new technologies, authorities will be gradually pressed to adapt their traditional policy-making and civic engagement approaches. New technologies have resulted in power reallocation and decentralisation, as well as new sources of competition (Schwab et al., 2016). When new technology is introduced, it often modifies the working environment and changes the circumstances to the point that existing regulations, practices and policies must be updated or new ones must be created because they might not be relevant or appropriate in the new setting (Balkaran et al., 2016).

The adaptability of public institutions and governmental bodies will decide whether they survive. Governments must show that they can embrace the disruptive revolution to keep their competitive edge, and they must either expose their institutions to new levels of efficiency and transparency or risk escalating unrest (Schwab et al., 2016). This supports Balkaran's statement that "the public sector has no choice but to modify the way it runs" and that doing this necessitates embracing digital transformation" (Balkaran et al., 2016:157). Legislators and regulators are being put to unprecedented levels of test because of the 4th IR's fast evolution and wide-ranging ramifications, and the majority are unprepared to handle it (Schwab et al., 2016). Understanding how a new technology will impact society and the global economy over the next few years can help policymakers and the general public get ready for it. Additionally,

they must choose how to finance infrastructure and innovative educational initiatives and assess the impact of disruptive economic change on competitive advantages (Manyika et al., 2013).

1.1.18 Skills and jobs

In order to fully realise the potential of the Fourth Industrial Revolution (4th IR), skills and capabilities are crucial. Because business practices are complex, competitive and demanding, knowledge workers need both hard and soft abilities (Ginting, 2020; Succi & Wieandt, 2019). Organisations now prioritise soft skills in the hiring process (Bak, Jordan & Midgley 2019; Dogara et al., 2019; Foerster & Golowko, 2018). Soft skills are character traits that have to do with a person's attitude, behaviour and personality (Lok, Cheng, & Choong 2021; Bak et al., 2019). It is vital to study and develop soft skills as their significance and demand increase (Juhász & Horváth, 2021). Nevertheless, few studies have been undertaken on developing and maintaining soft skills despite the rising relevance of these talents (Bak et al., 2019). Individual involvement in the 4th IR requires the development of soft skills and abilities.

After the global financial crisis of 2008, fewer full-time, conventional employment positions with comprehensive social benefits have been created. Instead, short-term contracts, self-employment, seasonal work and part-time employment have become the norm, all of which have a negative influence on job security (Borg, 2016). According to the World Economic Forum (2016), the 4th IR is predicted to result in the loss of 7.1 million jobs between 2015 and 2023.

1.1.19 Impact on people

The 4th IR will alter not only what people do, but also who they are, their sense of privacy, their consumption patterns, their ideas about ownership, how much time they spend working and how much time they spend relaxing, as well as how they discover their talents, advance in their careers, interact with others and build relationships (Schwab et al., 2016). Privacy issues will become more significant as the biotech and AI revolutions alter what it means to be human by redefining existing health, life span, reasoning and other capacities while forcing individuals to rethink their ethical and moral bounds (II et al., 2019).

Challenges of the 4th IR

1.1.20 Potential job losses

The 4th IR increased use of technology has reignited concerns about significant employment losses. Many of the major transformational drivers currently affecting global industries, according to the World Economic Forum (2016), are expected to have a significant impact on employment, ranging from significant job creation to job displacement, and from increased

labour productivity to increased skills. These fears are exacerbated in developing countries like South Africa, where governments are already struggling to reduce high unemployment.

1.1.21 Skills challenges

The much-needed intellectual advice for developing and implementing smart and digital projects comes from skills, innovation systems and knowledge-based communities (Abdoullaev, 2011; Scholl & Scholl, 2014). E-literacy (e-skills and e-literacy) has also been identified as crucial to the so-called smart company's success (Manda & Backhouse, 2017). Skills mismatches and redundancy have been cited as difficulties owing to the changing nature of occupations because of technological advancements and industrial practices (World Economic Forum, 2016). Furthermore, citizens' abilities to actively participate in social and economic activities in a smart society is influenced by their e-readiness (e-literacy and e-knowledge) (Manda et al., 2017).

Soft skills are escalating in significance and playing a bigger role (Bak et al., 2019:1063). Employees need soft skills to advance in their professional responsibilities in the modern world; simply having hard talents is not enough (Dogara et al., 2019:5872). Soft talents are a blend of mental, metacognitive, interpersonal, intellectual and practical abilities (Succi et al., 2019: 116). Soft skills are the attitudes, intrinsic characteristics, behaviours and aptitudes that enable people to successfully navigate their environments, collaborate effectively in teams, perform at their best, and achieve their objectives, according to Florea and Stray (2018:55). Simply described, soft skills are character traits, motivations, goals and preferences that are appreciated in the workplace (Succi et al., 2019:115).

1.1.22 Infrastructure challenges

One of the obstacles to the transition of the so-called smart society – which is propelled by digital connection, cutting-edge technology, skills, knowledge and creativity to promote economic and social growth – as mentioned in South Africa, is the country's low broadband penetration (Manda et al., 2017).

According to Sánchez et al. (2019:10), IT infrastructure is replete with security and privacy concerns (threats from viruses, worms, and Trojan horses; privacy and personal data; lack of awareness regarding interoperability; availability and compatibility of software systems and applications) and operating costs (high IT cost; IT professionals and consultancies; cost of installation and maintenance). When adopting and implementing the 4th IR, it is crucial to take this IT infrastructure into account.

1.1.23 Security and privacy

Security and data privacy concerns are perhaps two of the most urgent challenges in the 4th IR, where technology is the driving force. The 4th IR requires the creation of new security and protection measures to support collaborative value networks and smart production systems that are quicker and more adaptable. Data privacy and security issues are only going to become even more pressing as data analytics usage rises (Waidner & Kasper, 2016:1303).

Due to the serious issues with privacy and accessibility of stored data, security is a crucial additional aspect in the adoption of 4th IR (Farahat et al., 2019). For instance, a GPS may monitor and save data about a person's daily routine or residence, contact information, and communications like private emails and chats (Elmaghraby & Losavio, 2014). Additional difficulties have been noted, including the following:

i) Crowd sensing, which involves "using local inhabitants' sensing devices" and calls for encouraging participants while respecting their privacy.
ii) detection of fictitious data injections
iii) updated data privacy regulations.
iv) availability and
v) management and governments (Zhang et al., 2017:122)

There are more smart items in private homes, which raises the possibility of privacy violation (Wodjao, 2020). Many end users sacrifice monitoring in favour of usability and convenience (Zomet & Urbach, 2019).

1.1.24 Education

In terms of education, elderly users of 4th IR have technical difficulties. According to Assante et al. (2019), to provide an inclusive digital experience, usability and education issues for the elderly must be resolved. These technologies are already familiar to the younger generation. Smart technologies are the foundation of many services, making citizen education a crucial and significant factor. This may be achieved by encouraging residents to take an active role in their cities and in how they interact with them. They must learn how to use the resources provided by institutions and authorities.

Utilising mobile technology tools like tablets and Smartphones has been extremely beneficial for educational institutions. As

more institutions incorporate technology into their teaching strategies, education is progressively undergoing a transformation. To battle the COVID-19 epidemic, for example, most institutions were obliged to give lessons remotely utilising portable devices. Restrictions

have also been put in place, such as social distancing policies, that prevent individuals from being close to one another (Heymann & Shindo, 2020).

Opportunities of the 4th IR

Similar to previous revolutions, the 4th IR has the potential to increase global income levels and enhance the standard of living for people everywhere. Ohene-Afoakwa and Nyanhongo (2017:3) highlight the following opportunities.

1.1.25 Access to the digital world

Technological developments have made it possible to create new goods and services, which have improved the effectiveness and satisfaction of our daily lives. We may now carry out any of these actions remotely: making a purchase, paying a bill, transferring money, watching a movie, playing a game or listening to music. A supply-side miracle brought on by technological breakthroughs will also lead to long-term increases in productivity and efficiency. New technologies have disrupted the value chains of conventional industries and given rise to whole new ways of satisfying current requirements. Other sources of disruption include nimble, creative rivals that may dethrone long-standing incumbents faster than ever before by improving the standard, speed or cost of value delivery.

1.1.26 Enhancing the ability of the organisation to meet customer expectations

Customers are increasingly at the centre of the economy and businesses, with the goal of improving customer service. There is also growing transparency, customer participation, and new patterns of consumer behaviour (which are increasingly based on access to mobile networks and data), all of which provide opportunities for businesses to adapt how they develop, promote and provide products and services.

1.1.27 Opportunity to set industry rules

Legislators and regulators in Africa's banking sector are facing unprecedented challenges and, for the most part, are proven incapable of dealing with them. To reinvent the regulatory system and guarantee that they understand what they regulate, businesses must collaborate more closely with regulators. Technological advancements and corresponding economic impacts will greatly change the way companies operate and the way we operate. It is estimated that some industries and jobs will be automated from 5% to 100% in some cases. On average, the consensus is that 45-55% of the workforce will be automated on a blended average across all industries and sectors, so while some jobs might go away completely, others will not**.**

Key skill change drivers

The INSETA (2020) identifies key skill change drivers in the insurance sector. These are digital transformation, COVID-19, climate change, economy, regulatory environment and remote working.

These concerns have a significant impact on how skills are developed in the insurance industry. Re-training of present employees in businesses is necessary, along with a review of existing qualifications, the creation of new qualifications, and greater discretionary financing for skill development according to key skill drivers. Digital transformation of sectors continues to spawn new career opportunities in numerous tech-related areas. This will occur on the back of demand for seamless, quick and faceless interactions from consumers.

Climate change will necessitate re-skilling in areas of liability, underwriting, marketing, risk management, investment, pricing and asset risks. Regulatory changes in this area will necessitate training for varying needs of employees and board members. The COVID-19 pandemic is impacting on the insurance sector in multiple ways. A priority is to protect the health and safety of employees and their intermediaries. The COVID-19 crisis has emptied office blocks. Insurers are moving to work from home mode. There is a change from employer "presenteeism" to "achievement". Since staff are working from home, firms are making arrangements for remote working. Table 2.2. below outlines the key change drivers in the sector and their implications for skills development.

Table 0.2: Key change drivers in the insurance sector and their implications for skills development (Deloitte, 2018:20)

CHANGE DRIVERS	IMPLICATIONS FOR SKILLS DEVELOPMENT
DIGITAL TRANSFORMATION	
The digitisation process as part of the so-called Fourth Industrial Revolution was already underway prior to the COVID-19 pandemic, current events accelerated the trend. Clients in the sector want seamless, quick, and faceless interactions, requiring a new kind of tech-savvy marketer. Companies must provide quicker and more affordable goods, establish digital portals, consumer self-service, and back-end process automation, as well as interact with customers through online social networking while addressing cybersecurity concerns.	Graduates who are skilled in technological fields including blockchain, AI, social media, digital marketing, open-source, and machine learning have access to lucrative professional prospects. Creating a staff with the necessary abilities to manage client relationships, create new insurance products, and enter new markets is essential for insurance firms to succeed: • identify the ideal "young" talent • give customers a connection experience • develop novel goods • digitalise corporate processes • be aware of cybersecurity dangers
CLIMATE CHANGE	
Natural catastrophes are becoming more frequent and more severe as a result of climate change, which directly affects insurance companies. Regulators throughout the world are in reaction mandating more open disclosure of measures for measuring the impact of climate change, risk management plans, and climate change risk reporting, as well as more active management and board monitoring of climate-related risks. In terms of the economy, climate change may have a direct effect on the sector through increased insurance and lending to unaffected areas, decreased insurance due to climate change-related losses, increased uncertainty and loss of market confidence, falling asset prices and collateral values, and limited financing for reconstruction in affected areas.	For the areas of liability, underwriting, marketing, risk management, regulations, investment, pricing, and asset risks, re-skilling is necessary. The sector will also need expertise in developing measures for measuring climate change, risk management plans, and risk reporting.
COVID-19 PANDEMIC	
The pandemic has impacted the insurance sector in numerous ways and has, in many respects, amplified existing trends. Insurers have had to review and update disaster management plans and take steps to service clients with minimum disruption, while also setting and adapting safety protocols as the science has evolved. The crisis is also likely to increase policy lapses and reduce sales as the economy struggles to return to growth.	With training budgets constrained and the need for training urgent, reprioritisation of training and more efficient delivery of training are essential. Training is also needed to support businesses to transition to new modes of operation (e.g., supporting intermediaries shift to remote selling of products).
ECONOMY	
COVID-19 and the pandemic has pushed the unemployment rate to a record level of 32.5 percent by the end of 2020. Other problems afflicting the South African economy include corruption and so-called “state capture”; high fuel and transport prices; weakness in the SMME sector; high costs of doing business; high costs of data; and poor governance of state-owned entities and local governments.	through, for example, retrenchment mitigation schemes such as the Training Layoff Scheme. Further, short skills training courses are needed to enable employees to work effectively in a post-4th IR world. There should be a major focus on technology training for employees at all levels and efforts should be focused on saving existing jobs.
REMOTE WORKING	
Much of the challenge has been technological: putting in the necessary protocols and systems, ensuring access to the appropriate equipment, and managing privacy, data security, cyber security risks and other related challenges. At the same time, insurers also need to equip claim adjusters and assessors who often need to travel to perform their jobs.	Training to enhance employees’ digital capabilities as they navigate work from home has been a clear area of need, particularly in supporting ongoing connections to colleagues and customers. At the same time, managers need to be equipped to manage and motivate staff from a distance. On the positive side, remote work has opened the eyes of many employers to the possibility of sourcing skills globally instead of relying solely on the domestic skills stock.
REGULATORY ENVIRONMENT	
The insurance sector has been impacted by a number of legislative and regulatory changes over the past several years, with several other changes looming. The Conduct of Financial Institutions (CoFI) Bill, which would provide the framework for licensing depending on the kind of	Legislative and regulatory changes have both direct and indirect implications for skills development. The CoFI Bill will impact on the sector through requirements for professionals to upgrade their knowledge and skills to ensure that clients receive competent professional

activity, is among the significant legislative amendments in the works; (this relates to financial services offered). Insurance Notices, Policyholder Protection Rules (PPRs), further Regulations, and Conduct Standards are examples of secondary legislation that will fall under the Financial Sector Conduct Authority (FSCA).	services. Employees in the sector also need to be trained in applying the provisions of the POPI Act in everyday operational activities to ensure that all the personal information of natural and juristic persons is protected.

Theories

Theories are developed to explain, forecast and comprehend occurrences as well as, frequently, to question and advance current knowledge while staying within the bounds of crucial limiting assumptions. The structure that may retain or support a research study's hypothesis is known as the theoretical framework. The theory that explains why the research problem under study occurs is introduced in the theoretical framework and described in detail (Abend, 2013:179). “Both theory and research are blind and empty without the other” (Bourdieu & Wacquant, 1992:162).

A theory is a broad assertion of abstractions or concepts that claims, explains or anticipates correlations or connections between or among facts, within the bounds of crucial limiting assumptions that the theory expressly declares (Abend, 2013). The generalised statement combines ideas, "interrelated concepts, definitions, and propositions that explain or forecast occurrences or situations by defining relationships among variables” (Glanz, Rimer & Viswanath, 2008). The theories in a field are based on a rich and extensive body of knowledge known as the ideas, concepts and themes. Together, these concepts, ideas and themes make up the theory, which enables us to explain the purpose, nature, relationships and difficulties asserted about or predicted to relate to a phenomenon in a context of education or the social sciences. By applying these characteristics of the theory, we can understand the phenomenon and act more appropriately, including the ability to predict (Asher, 1984).

Qualitative researchers use theory in two different ways: one, as a means of theorising the project or study as a whole, the general theoretical lens through which the researcher approaches the topic, study and study design, methodology and method; and two, as a means of analysing and interpreting the data, gathering it into study "findings", and fashioning it into a story, an analytical whole, a theorisation. As a result, theory pops out in many areas during the research process. Whether expressly expressed or not, a theoretical approach constantly informs research (Sandelowski, 1993:215).

Summary

The research title, problem statement, research questions and study objective all served as the basis for the ideas and keywords used in the literature review. This chapter's discussion of many key difficulties within domains aims to give readers clear understanding of the topic

and insightful perspective. Challenges were among them, and they were in line with 4th IR. The opportunities of 4th IR and key change drivers were covered, which are important factors in driving the adoption of 4th IR within various environments.

The research methodology used in this study, including the research philosophy, research approach, research strategy, data collecting methods and data analysis methods, are covered in the Chapter 3.

CHAPTER 3: RESEARCH DESIGN & METHODOLOGY

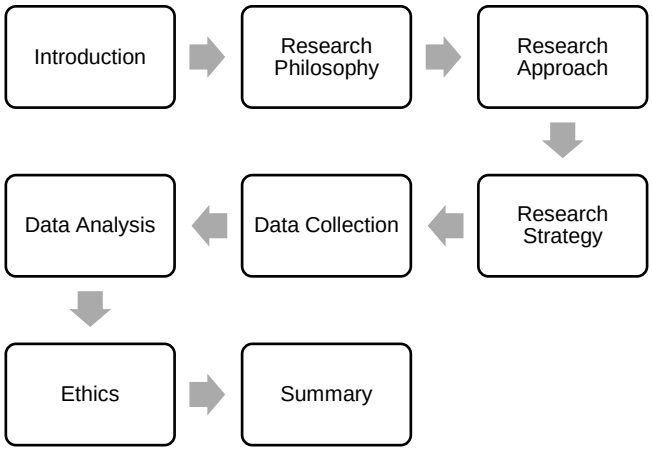

Figure 0.3: Layout of Chapter

Introduction

Research is described as a “sequential process including the gathering, recording, analysing, and interpretation of information” (Wilson et al., 2014:10). Myers (2019:6) defines *research* as an “original inquiry made to further knowledge and understanding in a particular topic”. The research onion of Saunders and Thornhill (2012) makes it easier for participants to choose the best approach. The research philosophy is where it all begins at the outer ring or layer. This establishes the starting point for the research methodology used in the second layer. The alternatives for the third layer's study plan are provided for the researcher to choose from. The fourth layer contains the time horizon information. The stage where the data collection and analysis approach are located is represented by the fifth layer (Figure 3.2).

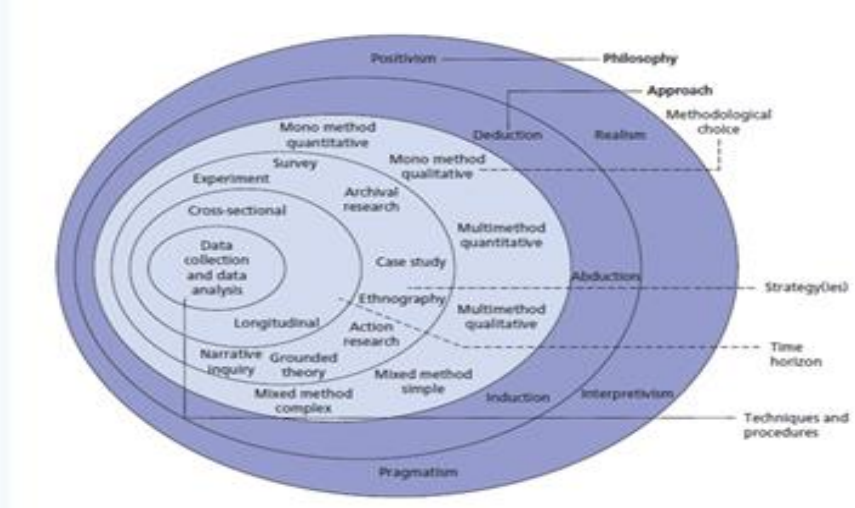

Figure 0.4: Research onion (Saunders et al., 2019:130)

This chapter (Figure 3.1) is structured as follows: i) research philosophy; ii) research approach; iv) research strategy; v) data collection; vi) data analysis; vii) ethics; and viii) chapter summary.

Research philosophy

Research philosophy focuses on the beginnings, character and development of knowledge. The principles of research concern how information about a phenomenon should be gathered, analysed and used (Bajpai, 2011). For this investigation, a subjective, interpretative philosophy was used. The “difference between ontology and epistemology is what is known to be true” (Scotland, 2012:13). Interpretivism combines people's interests into research by including researchers in the interpretation of study components. Accordingly, "interpretive researchers maintain that access to reality (given or socially generated) can only be established through social constructions like language, consciousness, shared meanings, and tools" (Myers, 2019:19). It allows for the probing of participant replies to provide context for their responses, enhancing the importance and depth of the data (Saunders, Lewis & Thornhill, 2007). In sections 3.2.1 and 3.2.2, subjectivism and interpretivism are discussed. Figure 3.3 details the philosophical assumption as a multidimensional set of continuation (Teddlie & Tashakkori, 2010:32).

Table 3.3: Philosophical assumptions as a multidimensional set of continuation (Teddlie & Tashakkori, 2010:32)

Assumption type	Questions	Continua with two sets of extremes		
		Objectivism	⇔	**Subjectivism**
Ontology	• What is the nature of reality? • What is the world like? • For example: – What are organisations like? – What is it like being in organisations? – What is it like being a manager or being managed?	Real External One true reality (universalism) Granular (things) Order	⇔ ⇔ ⇔ ⇔ ⇔	Nominal/decided by convention Socially constructed Multiple realities (relativism) Flowing (processes) Chaos
Epistemology	• How can we know what we know? • What is considered acceptable knowledge? • What constitutes good-quality data? • What kinds of contribution to knowledge can be made?	Adopt assumptions of the natural scientist Facts Numbers Observable phenomena Law-like generalisations	⇔ ⇔ ⇔ ⇔ ⇔	Adopt the assumptions of the arts and humanities Opinions Narratives Attributed meanings Individuals and contexts, specifics

1.1.28 Ontology

Assumptions regarding the nature of reality are referred to as *ontology*. The decision of what to explore for the project is determined by the ontology, which describes how to view the

business and management environment (Saunders et al., 2019; Bhandari, 2022). Metaphysics is a branch of philosophy that “analyses the nature of things, their existence, causation, and identity, includes ontology” (Ulmer, 2017:201). Objectivism and subjectivism are two of the major pillars of ontology.

Objectivism

An ontological stance known as *objectivism* “holds that social phenomena and their meanings have an existence separate from social actors” (Bryman, 2016:29). According to the premise of objectivism, "reality exists outside of or independently of the individual mind" (Moon & Blackman, 2014:1169). Providing dependability (consistency of results achieved) and external validity (applicability of the results to other contexts) are two benefits of objectivist research. However, as this research is not aiming to prove external validity, this position is not suitable as research philosophy.

Subjectivism

Reality may be "represented in a range of symbol and language systems and is stretched and moulded to serve the objectives of individuals so that people impose meaning on the world and interpret it in a way that makes sense to them" according to the subjectivist theory (Moon et al., 2014:1167). The subjective approach has been chosen for this research due to the qualitative rather than quantitative character of the data acquired, which implies that the data are unstructured and non-numerical rather than organised and numerical (Holden & Lynch, 2004).

1.1.29 Epistemology

Every aspect of the accuracy, scope and methods of knowledge acquisition are of interest to *epistemology*, including i) what constitutes a knowledge claim; ii) the methods by which knowledge may be generated or acquired; and iii) the methods by which the degree of its transferability can be assessed (Moon et al., 2014:1168). A theory of knowing called *epistemology* is concerned with views about "how phenomena [may] come to be known" (Giacomini, 2010:131) or how reliable knowledge is created. According to Pascale (2010:4), epistemology offers "a justificatory explanation of the scientific creation of knowledge" and is concerned with "the nature, origins, and boundaries of knowing". The two primary epistemic stances are positivism and interpretivism, respectively.

Positivism

Regardless of a researcher's devotion to objectivist scientific procedures, a postpositivist theoretical approach permits that "findings are not deemed absolute facts but rather are conjectural and circumstantial" (Phillips & Burbules, 2000). Positivism is a quantitative

approach since it concentrates on figuring out the rules that govern the physical world (Wells, 2004). Positivism is usually associated with quantitative research.

Interpretivism

Rejecting the idea that information is only there to be recognised and gathered, *interpretivism* asserts that humans build knowledge as they interpret their experiences of and in the world (Constantino, 2008; Pascale, 2010). To comprehend a circumstance, researchers must comprehend the meanings the situation contains for the participants, not simply their behaviours, according to Pascale et al. (2010). “The reconstruction of inter-subjective meanings, interpretative comprehension of the meanings people generates in a given situation, and how these meanings interact to form a whole are all parts of interpretivism” (Greene, 2010:68).

Research approach

Two types of approaches are outlined here, namely i) deductive approach and ii) inductive approach.

1.1.30 Deductive approach

Deductive analysis, also known as a priori analysis, often entails using the facts to evaluate a theory. It resembles a "top-down" method of data processing (Bingham & Witkowsky, 2021:135). Deductive reasoning involves moving from the particular to the general. In many cases, a “theory or case study that appears to indicate a causal connection or correlation may be true” (Gulati et al., 2009:42).

A deductive approach may be used with the positivist technique, which allows for the formation of hypotheses and the statistical testing of predicted outcomes with a respectable degree of probability (Snieder & Larner, 2009). Although in these situations the expectations could be obtained by hypothesis testing, the deductive method may still be applied with qualitative research approaches (Saunders et al., 2019).

1.1.31 Inductive approach

The inductive method is distinguished by a transition from a specific theory to a generic theory (Bryman & Bell, 2011). A more emergent approach is inductive analysis, in which the researcher looks through the data and permits codes to form or labels concepts as they do. It employs a more "bottom-up" analytical approach. Inductive analysis can take many different forms, but some popular techniques include open coding (also known as initial coding), in vivo coding (codes created from participants' own words), and continuous comparative analysis (Bingham et al., 2021:140). It may be advantageous to utilise this strategy, which is more frequently used in qualitative research, while the theory is still being established, since it may

lessen the likelihood that the researcher will be affected during the data gathering stage (Bryman et al., 2011).

An inductive approach has been chosen for this study, because interpretivism and the inherent approaches of qualitative research and inductive analysis methods make the most appropriate approach for achieving the objectives of the research.

Research strategy

Research strategy is described as "a broad approach to the conduct of research" by Bryman (2022). Similar to this, Saunders et al. (2009:600) describe *research strategy* as "the overall plan of how the researcher would approach addressing the study questions". A research strategy, in the opinion of Remenyi et al. (1998), establishes the general course of the study as well as the method by which the research is carried out. According to Saunders et al. (2009:603), the best research method should be chosen based on the following factors: research questions; aims; level of current knowledge on the topic; time and resource constraints; and the researcher's philosophical foundations. According to Mohajan (2018:30), the qualitative research approach gives the researcher a comprehensive view of participants' "feelings, opinions, and experiences, and interprets the meanings of their actions" enabling them to collect and analyse data more deeply in search of potential new insights. A qualitative research approach was applied for this study.

1.1.32 Case study

Case studies are "empirical investigations that explore a current phenomenon in its real-life surroundings, especially when the boundaries between phenomenon and context are not clearly obvious", according to Yin (2009:255). Case studies are described as "studies in which one case (single case study) or a limited number of instances (comparative case study) are selected in their real-life setting and scores acquired from these cases are examined in a qualitative way" by Dul and Hak (2008:4). As noted by Eisenhardt and Graebner (2007:25), "case studies can also be historical". A case study is a "methodology that is used to analyse a single occurrence in a natural context utilizing a range of approaches to gather in-depth knowledge" according to Collis and Hussey (2009:64).

1.1.33 Multiple case study

A *multiple case study* is "an extensive study of a person, a group of persons, or a unit to be generalised over a number of units" according to the definition of Solberg and Huber (2006:10). The *why* and *how* questions in the study are determined using a variety of case studies, which are recognised as one of the research methodologies (Harrison et al., 2017:15). Yin (2018:83) explains that case studies "can be divided into single case studies that can be

holistic or embedded designs as opposed to multiple case studies that can also be holistic or embedded design". The researcher becomes an observer and an integral member of the world of practice as a result of the numerous case study research. As an observer, a researcher learns from practitioners' expertise and create his own theories (Harrison et al., 2017).

Multiple cases are chosen such that individual case studies indicate either i) comparable outcomes (a literal replication) or ii) differing results but for predictable causes (a theoretical replication). The multiple case study "produces more persuasive evidence such that the study is deemed more robust than the single case study" when the goal of the study is to compare and reproduce the findings (Yin, 2017:55). Researchers must come to cross-case findings and create a cross-case report to publish a multiple case study, according to Yin et al. (2017). Researchers may have generalisable discoveries and create theories with data from several situations (Lewis-Beck, Bryman & Liao, 2003).

This study uses an exploratory approach since its goal is to gain a better understanding of the research topic rather than provide a solution. A multiple case study using two cases was chosen as a strategy. In this context, the effect of the 4th IR on employment in the insurance sectors in Cape Town, South Africa, was investigated. The criteria for the case were two insurance organisations, as both organisations have comparable units and both organisations were willing to participate in the research.

1.1.34 Sampling

Sampling is the "selection of a group of individuals within a specified demographic who will be contacted for research interviews" (Bryman et al., 2016:172). The portion of the population that is chosen for a study or inquiry is known as a research sample. A study's sample size and participant selection criteria influence the validity of results (Taherdoost, 2016).

For this study, the participants (12) were non-randomly, purposively and conveniently selected. Of the 12 participants selected, nine have more than 10 years of experience in the company and therefore have extensive knowledge in the operations and strategy of the company. Participants were chosen for their in-depth understanding of the topic. The participants included one Head of Business development, one Head of Transformation, one Head of HR Learning and Development, one Business Change and Transformation Manager, one Solution Architect Manager, one IT Portfolio Manager, one Head of Procurement, one Manager of Learning Design & Leadership Development, one Head of Change Management and three operational staff.

1.1.35 Unit of analysis

One of the initial phases in the qualitative data analysis process is choosing the unit of analysis. The section of material that will serve as the foundation for choices made during the creation of codes is referred to as the *unit of analysis* (Roller & Lavrakas, 2015: 262). The individual, group or thing that is the subject of the study is referred to as the *analysis unit*. Individuals, group members, organisations, nations, technologies, objects and other units are frequently used in analyses (Bhattacherjee, 2012).

The two insurance companies were designated as the unit of analysis for this study. Given that both organisations operate in the insurance sector, their units were equivalent (Boud et al., 2018).

1.1.36 Unit of observation

An item that is the subject of observation is one about which data is gathered. The use of specified units of observation in a survey or other research help participants clarify the legitimate conclusions that may be taken from the information collected. Researchers build conclusions on information that is collected and processed (Boyd, 2008:929).

The unit of observation in this study was the participants within the organisations namely: five department heads; three managers; one solution architect; and three operational staff for a total of 12 participants (Chapter 4, section 4.1).

Data collection

1.1.37 Questionnaire

Era, Mukherjee and Bordoloi (2020:460) define a *questionnaire* as, “a list of questions given out in a desired sequence, while an inventory/ battery is a list of statements”. Semi-structured questionnaires (Appendix B) were used to collect data from participants to explore the effect of 4th IR on employment in the insurance industries. This is corroborated by Nykiel (2007:55) who explains that questionnaires have the following advantages: i) questionnaires can be used to collect data from participants that are widely dispersed; ii) questionnaires can easily be analysed by the researcher; iii) questionnaires are cost and time effective; and iv) questionnaires are anonymous. The open-ended questions enabled respondents to elaborate based on their opinions and experiences. The semi-structured questionnaire (Appendix B) was designed based on the research aim and objectives, including the information gathered during the literature review (Appendix B).

1.1.38 Interviews

There are several ways to gather data and apply it in a case study research plan (Henning, Van Rensburg & Smit, 2004). For this study, data were collected by means of face-to-face interviews using an interview guide (Appendix B). The interviews were conducted via MS Teams. The duration of the interviews was 30 and 45 minutes. Interviewee data were recorded and then transcribed. The interviewees received the transcriptions back to check and confirm their accuracy and content. Each participant expressed written consent for each interview to be recorded.

The ethics that must be observed during the data gathering process were explained to all participants (Appendix B). Consent from the companies was obtained. Once consent was obtained, potential participants were identified and approached via telephonic and then email communication. Once the participants indicated their willingness to participate, an email containing background information, the ethical standards of the research, and an example of a letter of permission were sent to participants. Following receipt of the permission letter, appointments were scheduled, followed by the specific consent document for each individual participant. The consent letter contained, once again, the background to the research as well as the interview guide. Two days before the interview, a reminder was emailed to the participant and once again the interview guide was included.

Data analysis

Data gathered from interviews may be analysed using qualitative content analysis (Laudel & Glaser, 2014). The data may then be converted to text format, making analysis easier (Obalola & Adelopo, 2012). This study was qualitative in nature (Yang et al., 2018).

To provide the researcher with a comprehensive understanding of the data, data were gathered during the interview process and were then transcribed into a text construct. Once transcribed, the transcription was emailed to the individual participant for validation and a check of content correctness. The transcripts were then coded, keywords identified, summarised, categorised, and a thematic analysis conducted (Chapter 4; section 4.6).

Delineation

No other financial services providers other than the two insurance companies were used for this research. The companies are located in Cape Town in the Western Cape of South Africa

Ethics

1.1.39 Introduction

Ethics are "conduct rules that distinguish between appropriate and inappropriate behaviour" (Resnik, Elliott & Miller 2015:476). Honesty, plagiarising, informed consent and publishing authorisation are examples of ethical standards (Myers, 2019). According to Bengtsson et al. (2016), ethics must constantly be considered throughout the entire study process.

Prior to participating in the interviews, the participants received a briefing on their ethical rights. This was provided to let the participants know that they were not required to answer the questions and had the flexibility to withdraw their responses or withdraw from the research at any time they felt the need to do so if they were uncomfortable in any manner owing to the nature of the questions. The researcher adhered to the following principles of research ethics: i) minimising the risk of harm; ii) obtaining informed consent (Appendix B); iii) protecting anonymity and confidentiality; iv) avoiding misleading practices and principles (all principle were declared before the interview started); and finally, v) explaining the right to withdraw at any time (Bryman & Bell, 2007:65).

Various ethical principles were taken into consideration for this study. No data will be published without the organisation's approval, even though the researcher sought participant and organisational authorisation.

1.1.40 Ethical considerations

A democratic ethics paradigm of justice, equity and fairness is suggested by Simons (2009). The model's interactions stress the three key ideas of secrecy, discussion and availability. Confidentiality guarantees data reliability, trustworthiness and validity. In negotiations, non-harmful research is consulted. Accessibility is the requirement for quick data communication (Simon, 2009:101).

The following principles were adhered to during the research:

i) *Autonomy:* Participants were assured that their names would remain anonymous and that any information supplied would be kept private.
ii) *Beneficence:* Doing good
iii) *Non-malfeasance:* Avoiding harm
iv) *Justice*: Particularly noteworthy is distributive justice, which ensures that communities share benefits and risks equally.
v) *Ethical practice in relation to research colleagues:* Interviewees were assured that all information and support sources would be acknowledged, and that the researcher would not utilise the results for personal advantage. The participants voluntarily participated and also could withdraw at any point from the research.

vi) *Ethical practice in relation to research participants:* The study's goal and the planned research were made apparent from the beginning. The organisations and each interviewee gave consent for the research to utilise their insights. The research was conducted with integrity, clarity, thoroughness and responsibility.

vii) *Anonymity:* The research treated all the respondents as anonymous. The research did not identify any participants in any way. The research findings were disseminated for peer review to validate responses.

viii) *Ethical practice in relation to the environment:* The study did not cause physical or emotional harm to any participants.

ix) *Access:* The research acknowledges society's right to prompt access to all study results, which are subject to discussion on any implications. Ethical practices in respect to South African society were followed. This study intends to benefit the insurance industries in South Africa.

Summary

In Chapter 3, the research methodology is discussed including the research philosophy, research approach, research strategy, data collection and data analysis.

The chapter's ontology and epistemology topics emerged from the research philosophy. An interpretivist epistemology was employed in this study because there are several viewpoints on the phenomena being examined, and a subjective ontological stance was chosen since participants had their own perspectives on the phenomenon being studied.

A purposeful, convenient and non-random sample was selected for the case study, with 12 participants from two different insurance industries comprising the sample which was chosen based on participant availability and willingness to participate. Semi-structured interviews were conducted to acquire the data from the interviews. All information from the 12 participants was gathered and then analysed. The process of analysis involved summarising the keywords and main themes, categorising them, and then undertaking thematic analysis.

In the next chapter, the data analysis and results are discussed.

CHAPTER 4: DATA ANALYSIS & RESULTS

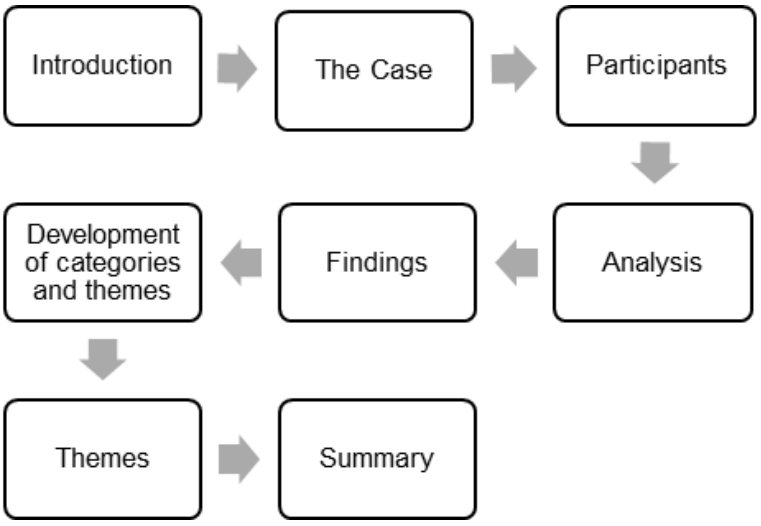

Figure 0.1: Layout of Chapter 4

Introduction

This chapter (Figure 4.1) provides a presentation of the analysed data and interpretation of data captured, which answer the research question in Chapter 1 of the study. This chapter goes into further detail on the research interviews with 12 participants and the conclusions drawn from those responses. The problem statement, key research question and the aim of the study are once again presented for the convenience of the reader, as stated below.

i) Problem statement

Despite the literature available on the 4th IR, there is still a gap on the effects of the 4th IR on employment on the insurance sector in South Africa.

ii) Research questions

RQ1. What are the effects of the 4th IR on employment in the insurance sectors?
RQ2 How can the 4th IR affect the future of work in the insurance sector?

iii) Aim of the study

The aim of the study is to explore the effects of the 4th IR on employment within the insurance sector in Cape Town, South Africa.

iv) Objectives of the study

a) To determine the emerging threats and opportunities that will influence engagement with the future of the 4th IR in the insurance sector.
b) To evaluate the progress and failures related to 4th IR employment in the insurance sector.

c) To determine challenges (critical issues) that may be caused by the 4th IR on employment in the insurance sector.

Cases

The research was based on a multiple case study (two companies) and focused on effect of the 4th IR on employment in the insurance sector. The businesses chosen are two financial services companies based in Cape Town, South Africa.

1.1.41 Santam

Santam is a South African financial services group that also has business interests in Malawi, Tanzania, Uganda, Zimbabwe and Zambia. Santam's head office is located in Bellville in the Western Cape, South Africa. The company, listed on the Johannesburg Stock Exchange (JSE), is South Africa's largest short-term insurer. Santam was established on 28 March 1918. One month later, the South African Life Assurance Company (Sanlam) was established as a full subsidiary of Santam to focus on life assurance while Santam remained focussed on short-term insurance. Santam believes in the simple principle that insurance should add value, not questions or uncertainty.

Santam is the leading general insurer in South Africa with a market share of more than 22%. They provide a diverse range of general insurance products and services in southern Africa and internationally through a network of 2 700 intermediaries and direct channels. They serve more than 1 million policyholders who range from individuals to commercial and specialist business owners and institutions. The group derives revenue from insurance activities and investments. Insurance activities include commercial and personal insurance and alternative risk cover. The performance of insurance activities is based on gross written premium as a measure of growth, with net insurance result as a measure of profitability.

The group consists of the Santam branded business units (Santam Commercial and Personal, Santam Specialist and Santam and wholly owned subsidiaries: MiWay (direct insurer), Centriq (cell captive insurer) and Brolink (an independently managed insurance administration business). A few specialists underwriting managers are included within Santam Specialist. The group also participates in investments and partners emerging markets in Africa, India and Southeast Asia through collaboration with Sanlam Emerging Markets (SEM).

1.1.42 Sanlam

Sanlam is a South African financial services group headquartered in Bellville, Western Cape, South Africa. Sanlam is the largest insurance company in Africa. It is listed on the Johannesburg Stock Exchange, the Namibian Stock Exchange and the A2X. Established in

1918 as a life insurance company, Sanlam Group has developed into a diversified financial services business. Its five business clusters comprise Sanlam Personal Finance, Sanlam Emerging Markets, Sanlam Investments, Sanlam Corporate and Santam.

The Group's areas of expertise include insurance (life and general), financial planning, retirement annuities, trusts, wills, short-term insurance, asset management, risk management and capital market activities, investment, and wealth. The group operates in South Africa, Namibia, Botswana, Swaziland, Zimbabwe, Mauritius, Malawi, Zambia, Tanzania, Rwanda, Uganda, Kenya, Ghana, Nigeria, Mozambique, India, Malaysia and the UK, and has business interests in the US, Australia, Burundi, Lesotho and the Philippines. It has a stake in micro-insurance specialists, UK-based Micro-Ensure Holdings Limited, which has a footprint across Africa and India servicing more than 10 million enrolled clients. Its 2018 acquisition of SAHAM Finances has made it Africa's biggest non-banking financial services player and has given it exposure to Morocco, Angola, Algeria, Tunisia, Niger, Mali, Senegal, Guinea, Burkina Faso, Cote D'Ivoire, Togo, Benin, Cameroon, Gabon, Republic of the Congo, Madagascar, Lebanon and Saudi Arabia.

Over the years, Sanlam's focus gradually shifted from traditional life insurance to providing a broader range of financial products and services. In 1998 Sanlam demutualised, listing on the Johannesburg Stock Exchange (JSE) Ltd and the Namibian Stock Exchange. This changed Sanlam from a mutual entity into a public company with a share capital, namely Sanlam Life Insurance Ltd. At the same time. a separate company, Sanlam Ltd, was installed as the parent company of the Sanlam group of businesses. The group was also restructured into several independent businesses within a federal business structure. Sanlam is a diversified financial services provider with an extensive product offering catering for all market segments. The group has consistently grown its local as well as an international footprint; it now has a presence in 33 African countries also India, Malaysia, the UK and Ireland, the USA, Australia and the Philippines.

Sanlam has since 1993 contributed to broad-based black economic empowerment (B-BBEE) through the group's partnership with Ubuntu-Botho Investments. The Ubuntu-Botho B-BBEE partnership resulted in a broad-based black empowerment consortium buying a 10% shareholding in Sanlam in what was to become one of the most far-reaching black empowerment transactions in South Africa to date.

The corporate office of the Sanlam Group is responsible for centralised functions that include strategic direction, group financial and risk management, group marketing and communications, group human resources and information technology, group sustainability management, corporate social investment and general group services.

Participants

Two organisations with 12 participants were interviewed to answer the research questions (Table 4.1). Both organisations are based in Cape Town.

Table 0.1: Participants' business unit, job title and years of experience

Code	Organisation	Roles	Years of experience
P1	Santam	Head of Business Development	20+
P2	Sanlam	Business Change & Transformation manager	10 +
P3	Sanlam	Head: HR Learning & Development	20+
P4	Santam	Head: Transformation	5+
P5	Sanlam	Human Resources Consultant	10+
P6	Sanlam	IT Portfolio Manager	15+
P7	Santam	Head: Procurement	15+
P8	Sanlam	Office Manager	10+
P9	Sanlam	Head: Change Management	15+
P10	Santam	Manager: Learning Design & Leadership Development	10+
P11	Santam	Solution Architect	15+
P12	Sanlam	Transformation Coordinator	5+

*P-participant

The majority of the participants (10 of 12) are very knowledgeable on the issues and have 10+ years of experience in the organisations. Participants were selected based on their understanding of the topic and diversity. Each participant has more than five years of job experience in the organisations. Five department heads, three managers, a solution architect, and three employees on the operations team are among the participants. The workers gave their consent for the collection of their data (Appendix A).

Analysis

The transcribed interviews were read several times and the transcriptions were emailed to the participants to verify that the transcriptions are correct, and that the intent of the participants is correctly captured. The transcriptions were then transferred into an Excel spreadsheet, linking every interview question to the research and sub-research questions and responses of the participants. An example of an extract from the transcribed interviews is shown in Table 4.2.

Figure 0.2: Example of a transcribed interview (IQ-interview question; P-participant)

INTERVIEW TRANSCRIPTION P1
RQ1: What is the effect of 4IR on employment in the insurance sectors?
IQ1.1.1: Which skills are going to become more important for staff in the fourth industrial revolution? PI Comment: Essentially artificial intelligence and related will be able to replace human intelligence / logic in many business processes and business models. Skills related computing, data mining, extracting value from information, business and innovative skills will become more important
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4IR? PI Comment: Functional skills, soft skills and candidate ability to function and add value in a networked world
IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4IR environment in your organisation? PI Comment: Business, Human Resources

Table 4.3 shows an example of how the codes were identified. Once the first round was completed, a second re-coding took place as shown in the example in Table 4.2.

Table 0.3: Example of identified codes and concepts (red highlights present the codes and concepts)

IQ	Interview questions	Codes	ReCodes
1.1.1	Which skills are going to become more important for staff in the fourth industrial revolution?	P1: Essentially artificial intelligence and related will be able to replace human intelligence / logic in many business processes and business models. Skills related computing, data mining, extracting value from information, business and innovative skills will become more important.	Data mining skills Soft skills Computer skills Innovative skills
1.1.2	What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR?	P1: Functional skills, soft skills and candidate ability to function and add value in a networked world. Workforce readiness for the future of work certainly is a pronounced agenda item.	Re-skill employees Workforce readiness Functional skills
1.2.1	How do technology, organisational, environmental contexts influence digital Transformation in your organisation?	P1: The rapid change the 4th IR is effecting is impacting business models, strategy, and execution. The focus on digital transformation has increased commensurately with a big increase into organisational priority and allocation of resources.	Business change Rapid change Improved productivity
1.3.1	How do you think 4th IR will impact employees' lives?	P1: The 4th IR has fundamentally changed the way we all live, work, and relate to one another. At an organisation level, one of the main effects of the 4th IR is increased productivity. With the support of technology, we have been able to improve the speed, accuracy, and quality with which select tasks are completed. Further communications and interaction be it with fellow co-workers, or customers, suppliers and intermediaries has completely changed; video platforms allow us to work from home or anywhere else in the world. We also have access to the world in the palm of our hands, external services are available at the touch of a button, significantly increasing the efficiency and convenience of our personal lives.	Hybrid work MS team Improved productivity Cost savings
1.5.1	Is your organisation preparing for the 4th IR? If yes, how?	P1: Yes, blended working is already happening and there are constant upskilling opportunities internally (on SkillSoft and the Santam Learning Academy) to be able to self-manage and to build resilience on all the changing aspects of the industry.	Learning opportunities Hybrid work (from home or office)

*IQ-interview questions

This was an iterative process to ensure that all possible codes were identified. This was done by identifying and combining synonyms, similar meaning words and concepts. Figure 4.3 shows how codes and concepts were identified and linked.

Participant 5	Participant 7	Participants 6	Summary
Technical skills like data analytics, data is very important on how they will make decisions and how operate within their organisations. Data analytics skills become more important.	For my organisation I would say skill needed is emotional intelligence (EI). In a space like financial planning, where understanding your client's emotional needs is critical in helping them feel secure, this is an especially important human skill.	Innovative thinking, analytical minds, EQ, ability to collaborate, take initiative etc.	The most important skills needed by employees in the fourth industrial revolution are data analytics, emotional intelligence. EQ is very important in understanding your clients' emotional needs.

Figure 0.3: An example of an extract from analysis (creating a summary from responses)

Table 4.4 presents a summary of the responses of the participants linked with the IQs, Appendix E.

Table 0.4: An example of the summary of responses of participants linked to IQs

Interview questions	Codes (Phrases)	List of Participants and their responses											
		P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
IQ 1.1.1. Which skills are going to become more important for staff in the fourth industrial revolution?	IT Skills; Analytical skills; Robotics skills; Automotion skills; computer programming.	X	X	X		X					X	X	X
IQ 1.1.2. What are the factors to be considered in determining the employment readiness in your organisation for the 4IR?	Workforce Readiness; Growth mindset; Reskilling employees.		X			X		X		X			
IQ 1.1.3. Which role-players should be involved in the determination of skills shortages for employability in the 4IR environment in your organisation?	HR; Learning and Development; IT specialist		X		X		X	X	X				
IQ 1.2.1 How do technology, organizational, environmental contexts influence digital Transformation in your organisation?	Impacting business model; Changed the ways in which businesses compete and interact with their markets; Retrain employees to aquire new skills; Improved productivity	X	X			X	X			X	X		X
IQ 1.2.2. What are the IT capabilities and resource dependencies for your organisation? How do these influence 4IR transformations?	**Capabilities:** are human IT skills; Lack of IT skills; AI and Automotion; IT infrastructure expensive **Influence**:Increase efficiency & effectiveness in business			X	X	X	X			X	X		X
IQ 1.3.1. How do you think 4IR will impact employees' lives?	Hybrid work; some jobs will become obsolete; communication via MS Teams; new skills			X		X		X	X				X
IQ 1.3.2 What are the potential implications and impact on the insurance sector because of the 4IR movement?	Adaptability; AI development skills; problem solving; Technical skills;					X	X	X	X	X	X		X
IQ 1.3.3. What are the potential implications and impact on the insurance sector as a result of the 4IR movement?	Disrupt labour markets; Inequality; Displacement of workers by machines; Blockchain; Competition	X	X		X	X		X	X	X		X	X
IQ 2.1.1 How does your organisation determine the characteristics and skills required for the 4IR?	Five force analysis, Re-evaluating operations; Data analysis and SkillSoft program	X		X	X	X		X		X	X		
IQ 2.1.2. What jobs most likely to be impacted?	Administrative; HR; Customer service jobs	X	X	X				X			X		
IQ 2.1.3. What jobs are the least likely to be impacted?	AI; IOT; Compter science, engineering; HR; IT	X	X				X						X
IQ 2.1.4 How will 4IR empower employees to upskill themselves?	Active learning; online training;		X	X		X	X			X	X		X
IQ 2.2.1 What are the advantages and disadvantages of 4IR?	**Advantages:** fast track processes; awareness of customers; and Flexibility. **Disadvantages:** Scarce skills, costly to implement 4IR;	X		X	X		X	X	X		X		X
IQ 2.2.2. How will the 4IR affect your organisation?	Blockchain; opportunities, communication; employment	X	X			X	X	X		X	X		X
IQ 2.2.3. Do you view fourth industrial revolution as a threat or opportunity for your organisation?	Growth opportunity, cybersecurity		X	X	X	X	X	X			X	X	
IQ 2.2.4. Is your organisation preparing for the fourth industrial revolution? If yes, how?	Initiatives, preparation, trainings and learning	X	X			X	X	X	X		X		

*P-participant

The following section (section 1.5) expands on analysis in greater detail. It is given in accordance with the research questions based on the information gathered from the interview transcriptions (RQ). The participants are listed as P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11 and P12.

In the next section, the answers to the interview questions are presented. Examples of interviews are given, and each interview question summarised in one or more findings. The findings are then summarised and categorised and themes developed.

Findings

The responses from the 12 participants were collected as findings and discussed in regard to the questions. For each interview question, the results were provided. In this chapter, the information from the interview transcripts is given according to the research questions (RQ), sub-research questions (SRQ) and the specific interview question (IQ), linked to the SRQ.

1.1.43 RQ1: What is the effect of 4th IR on employment in the insurance sectors?

SRQ1.1: How are employees in the insurance sector ensuring the relevance of their skills within the context of the 4th IR?

IQ1.1.1: Which skills are going to become more important for staff in the 4th IR?

Most of the participants (P1, P2, P5, P6, P7, P8, P9, P10, P11 & P12) stated that the most important skills for staff in the 4th IR are data science, data analytics, emotional intelligence, leadership skills and data mining. P4 stated that,

> *Personally, I feel that there's a lot of fear that exists in the hearts of employees. This fear is driving behaviour that either promotes acquisition of new skills of the desire to hold onto existing skills to create your own sense of relevant and validity. Therefore, I believe that the ability to overcome challenge, to vision out and create a future (of a process, product, experience, business model, strategy) and not fear failure (or probability of failing) is critical. It's about the mindset that people will need to embrace to imagine a future that is hopeful, flexible, and human* (Appendix C).

P3 mentioned that "the ability to work with new technologies being introduced, the ability to implement, monitor and evaluate the effectiveness of the automation processes for new technologies being introduced & the ability to improve customer experience" (Appendix C).

Finding 1: The most important skills are data science, data analytics, data mining, emotional intelligence, leadership skills

IQ1.1.2: What are the factors to be considered in determining employment readiness in your organisation for the 4th IR?

Participants (P2, P3, P4, P5, P7, P9, P10 & P12) stated that workforce readiness for the future of work for employees based on their skills is certainly a pronounced agenda item; re-skilling employees for the new technology must be a priority (Appendix C). P6 mentioned that,

> *Technology being used (legacy or modern applications), process management and process engineering, current skills that employees have banked in the repertoire. In addition to this, I*

> *believe that the desire of the leadership team and decision makers at the top determine whether an organisation is going to do enough to stay relevant and respond to market changes or drive market change* (Appendix C).

P1 said that "Functional skills, soft skills and candidate ability to function and add value in a networked world". P8 agrees that "the availability of technical skills, soft skills and entrepreneurial skills within the employees are factors to be considered" (Appendix C). P11 mentions that "a progressive culture, embraces change, agile work environment, promotes culture of continuous learning**"** (Appendix C).

Finding 2: Workforce readiness for the future of work includes a growth mindset, employees who are innovative, creative, resourceful, adaptable, curious and believe in the concept of lifelong learning

Finding 3: Re-skilling employees for the new technology to deliver against the rapid pace of the 4th IR poses a significant challenge for the insurance environment

Finding 4: The 4th IR requires employees with a growth mindset, employees who are innovative, creative, resourceful, adaptable and curious

IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation?

P1, P2, P4, P5, P6, P7, P8, P9 and P12 mentioned i) HR practitioners; ii) business and department heads, iii) learning and development teams; iv) talent management; v) talent acquisition teams; and vi) IT. P3 suggested,

> *This is a conversation largely led by the HR functions, specifically the talent management and acquisition teams. These functions at all times have their ear on the ground in terms of skills demand versus supply – an ever-evolving space. Beyond this, skills acquisition aligns squarely with the strategic direction set by a business, into which markets it is growing, how rapidly it intends to grow and how this business strategy should be resourced. This level of input resides with senior leaders within a company including the CEO and his/her executive committee. The Chief Information Officer will be very close to how this particular area of work is growing/changing and can input on the specifics of what is required to lead or keep up* (Appendix C).

P11 said that "It is no longer just HR that plays this role. It should be driven by line managers and supported by the executive management teams as well" (Appendix C).

Finding 5: The HR team is not involved in the determination of skills shortage in the 4th IR environment

Finding 6: IT practitioners play a role in determining skills shortages in the 4th IR environment

Finding 7: Line managers and executive support should be involved in the determination of skills shortages

SRQ1.2: How is the 4th IR transforming business?

IQ1.2.1: How do technological, organisational and environmental contexts influence digital transformation in your organisation?

Six participants (P1, P2, P6, P8, P9 & P10) gave a positive response to this question. According to P1, "The rapid change the 4th IR is effecting is impacting business models, strategy, and execution. The focus on digital transformation has increased commensurately with a big increase into organisational priority and allocation of resources" (Appendix C). P2 mentioned,

> *Digital transformation has completely revolutionised the ways in which businesses compete and interact with their markets; the change has taken place across the entire value chain. At Santam, technology is being integrated along the entire employee lifecycle, from recruiting to onboarding and ongoing training, we interact with our suppliers, brokers and indeed customers largely through various technological platforms. Digital transformation has taken place across all areas of our business, resulting in fundamental changes to the way we operate. Significant external pressure and factors has certainly contributed to this transformation* (Appendix C).

P8 commented as follows,

> *Technology has resulted in the ability of employees to do their jobs remotely which has resulted in more flexibility in their personal lives, resulting in a richer organisational culture where employees feel trusted by their managers to do their jobs without being looked over the shoulder. Environmental contexts have influenced the organisation to go into the digitisation of paper records due to the real threat of climate change* (Appendix C)**.**

P11 mentioned that "as technology becomes much more accessible and affordable, we need to adapt our internal systems and process. This will mean replacing legacy systems, adopt process improvements and invest more in data analytics to understand our customer base and behaviours" (Appendix C). P9 said, **"**Digitalisation calls for new ways of workplace communication and collaboration and can be understood as the use of digital technologies and data". According to P10, "If technology is implemented it has tremendous effect on the route that our company must take and strategy it must follow as well as new products offerings that it needs to bring" (Appendix C).

Finding 8: Digital transformation has taken place across all areas of their business, resulting in fundamental changes to the way they operate; significant external pressure and factors have certainly contributed to this transformation

Finding 9: The 4th IR has improved productivity

Finding 10: Digitalisation calls for new ways of workplace communication and collaboration

Finding 11: There is more workplace flexibility than before (e.g., remote working)

Finding 12: The 4th IR has transformed the ways in which businesses compete and interact with their markets (suppliers, brokers and customers) largely through various technological platforms e.g., MS Teams, ChatBot

Finding 13: Invest more in data analytics

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Seven participants (P3, P4, P5, P6, P9, P10 & P12) mentioned that one of the biggest dependencies is skills, as there is a lack of skilled people to develop the 4th IR technologies in the South African market. A further dependency is the lack of the IT infrastructure (hardware and software and licenses) combined with the high cost of the IT infrastructures. P9 explained that "one of the main effects of the 4th IR is increased human productivity. With technologies like AI and automation augmenting our professional lives, we're able to make smart choices, faster than ever before" (Appendix C). P10 was of the opinion that a "New job profile will be required, and new positions will also be required, and HR must transform as well as HR practices needs to be more versatile. Also, Virtual mobility has increased in terms of skills" (Appendix C). According to P12, "IT capabilities are human IT skills and IT infrastructure and the influence of these capabilities and resources in 4th IR transformation is that they will increase efficiency and effectiveness in our business process" (Appendix C). P1 suggested, "IT capabilities are crucial enablers of moving an organisation forward on its digital journey. The appropriate IT skills as well business skills that understand how to extract optimal value from a networked world are major dependencies" (Appendix C). P7 mentioned, "In my organisation we have high IT capabilities in place that will help us create digital transformation by redesigning and rethinking existing business processes and by transforming traditional product, service and customer offerings to digital offerings" (Appendix C). P8 supported by mentioning, "Capabilities and resources will enable effective digital business strategy, and at Sanlam we have IT capabilities that enable high digital transformation in product offering, and services" (Appendix C).

Finding 14: Skill barriers and the need for re-skilling

Finding 15: New job and position profile required

Finding 16: IT Infrastructure barriers limiting the rollout of the 4th IR

Finding 17: Both companies have started to introduce 4th IR

Finding 18: IT capabilities are human IT skills and IT infrastructure and the influence of these capabilities and resources in 4th IR transformation is that they will increase efficiency and effectiveness of business processes

Finding 19: The 4th IR has increased human productivity as humans are able to make smart choices

Finding 20: IT capabilities and resources will enable effective digital business strategies

SRQ1.3: What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: *How do you think* the *4th IR will impact employees' lives?*

Five participants (P2, P5, P7, P8 & P12) stated that it will change the way they work, live and relate to one another although some will lose their jobs. According to P12, "Communications and interaction be it with fellow co-workers, or customers, suppliers and intermediaries has completely changed; video platforms allow us to work from home or anywhere else in the world" (Appendix C). P2 supported that by stating,

> *The 4th IR has fundamentally changed the way we all live, work, and relate to one another. At an organisation level, one of the main effects of the 4th IR is increased productivity. With the support of technology, we have been able to improve the speed, accuracy, and quality with which select tasks are completed* (Appendix C).

P7 said, "As things become automated there will be more efficiencies and people will not be required to do mundane tasks that can be done by software bots and AI-enabled technologies" (Appendix C). P3 argued,

> *The employees who are willing and ready to learn will find their jobs being made more efficient by the implementation of the relevant technologies, with the inverse proving true to those unwilling to learn. Streamlined processes may also mean that some employees lose their jobs as the use of human capital will not be needed, then employees will need to upskill in order to be able to monitor and evaluate the effectiveness of automated processes if they still want to be employed. The impact of 4th IR will be evaluated by how the employees adapt to the various processes being implemented* (Appendix C).

P5 argued that "Unfortunately, there are some people who may be left behind due to the fast-paced technology gets produced and they may not have the acumen to understand the 4th IR technologies and as well some jobs may become obsolete which means people may need to re-trained or re-purposed" (Appendix C). P1 admitted, "Employees will have deal with accelerated pace of change, disruption of business models they are currently operating in as

well as possible redundancy of their current skillset with the opportunity to get involved in new opportunities created by the impact of 4th IR". P11 expressed, "Adapt or die basically. We have not fully understood and embraced the 4th IR and there is already talk of a 5th IR. Employees will need to adapt skills and attitude to remain relevant in the workplace". P9 supported this by saying the workers that will be most affected by the 4th IR will be those that may now feel vulnerable to competition with robots; that is, those whose jobs require moderate skills such as customer service that could be easily replaced by artificial intelligence (Appendix C).

Finding 21: Worse outcomes for some employees

Finding 22: Some employees lack knowledge of 4th IR to perform well

Finding 23: Some jobs may become obsolete; people may need to re-train or re-purpose

Finding 24: With the support of new technology, productivity has increased

Finding 25: Communications and interactions have changed (e.g., meetings via MS Teams)

Finding 26: With the exit of non-digital skills, re-skilling is imperative

Finding 27: Employees can work from anywhere; office space may be a thing of the past

IQ1.3.2: What are the potential implications and impact on the insurance sector because of the 4th IR movement?

Six participants (P5, P6, P7, P10, P9 & P12) argue that the 4th IR can have a positive impact. According to P10, "the insurance market will become much more competitive, and consumers will have more choice on insurance available to them. It will also be much more accessible, especially with a younger customer base that is technology savvy" (Appendix C). P1 argued,

> *The insurance industry is rated as one of the industries the most at risk of disruption. With insuretechs gaining momentum and critical mass the impact of this will be negative if the insurance industry current incumbents are not willing or able to respond or it may create the burning platform required to drive innovation and renewal in this industry* (Appendix C).

P9 supported P1 by saying,

> *The insurance industry has been experimenting with technologies (e.g., blockchain) that facilitate even more unsupervised transactions and decisions. Coupled with data and data analytics, these technologies are dramatically changing the way business operates. In addition to the obvious technology reliance and resilience risks, these shifts introduce a completely new set of risks to a company* (Appendix C).

P2 explained,

> *With South Africa's high unemployment rate, the 4th IR could result in greater inequality, this because of its significant potential to disrupt labour markets. As the drive to automate replaces labour across the entire economy, the net displacement of workers by machine has the real and likely potential to exacerbate the gap as relates to availability of select, largely menial jobs, many of which are typically reserved for unskilled labour. The insurance sector is no exception, roles which were typically human driven such as claims, customer support are increasing redundant as a result of digitisation. Further, South Africa will need to re-skill a significant portion of its population to deliver against the rapid pace of the 4th IR this poses a significant challenge for our local context* (Appendix C).

P4 stated that the,

> *Ability to price products for vehicles that will do more km's than the average in the past. With the rise of electric vehicles, mechanical parts in vehicles will be reduced because the less moving parts equals less maintenance. How we insure vehicles that will maintained/services via software update will change our business model. This also opens a door to unauthorised hackers and cyber threats gaining access to vehicles and overriding drivability* (Appendix C).

P8 mentioned that,

> *The negative impact is that some jobs will become obsolete; some jobs will have to be redefined as well as the environments will change. We already have the ability to work from anywhere, meaning office space may be a thing of the past. A lot of change is coming and some of the change is happening already* (Appendix C).

Finding 28: The 4th IR could result in greater inequality, a consequence of its significant potential to disrupt labour markets

Finding 29: Digital identity is something that will be insured, and the insurer will be charged to access client identity via technology called self-sovereign identity of a blockchain network

Finding 30: Roles typically human driven, such as claims and customer support, are increasingly redundant as a result of digitisation

Finding 31: The insurance industry has been experimenting with technologies like blockchain that facilitate even more unsupervised transactions and decisions

Finding 32: Insurance market will become much more competitive, and consumers will have more choice of insurance available to them

Finding 33: There is a lack of skilled employees to deliver the needs of business as a result of the rapid pace and the changes introduced by the 4th IR

Finding 34: Improved services and product offering in real-time

1.1.44 RSQ 2: How can the 4th IR affect the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Participants (P1, P3, P4, P6, P7, P9 & P11) are positive on what the company is doing to determine the skills and characteristics required for 4th IR. P1 said that "My organisation has taken the approach of using implementation partners which helps by bringing in experienced people to help with the implementation of these new project while there is knowledge transfer to our inhouse resources" (Appendix C). P4 said, "I would say business owners with support from HR functions are the primary role players in determining what skills and competencies are required for specific job families and roles and as such will the role players in determining organisational skills required for 4th IR" (Appendix C).

Participants P7, P9 and P10 mentioned the training opportunities available for the staff. P7 believed, "My organisation has started on the journey of implementing 4th IR related technologies. By looking at re-evaluating our operations and how we do business. Big data and analytics will be central to everything - from product development, supply-chains to the customer experience" (Appendix C). P9 stated, "Our strategy department conducts an annual five forces analysis coupled with a pestle analysis to determine the macro and micro factors that influence and impact the organisations capability to respond to the market conditions" (Appendix C). P10 said that "The group has embraced AI and ML in a few of its investment solutions, such as the Sanlam AI Global Managed Risk Fund" (Appendix C).

Finding 35: Data analysis and people soft skill programmes are in place to support employees

Finding 36: An annual five forces' analysis with a pestle analysis determines the macro and micro factors impacting the organisation's capability to respond to market conditions

Finding 37: Both organisations have started the journey to implement the 4th IR

Finding 38: By looking at current business strategy and re-skilling employees

IQ2.1.2: What jobs are most likely to be impacted by 4th IR?

Participants (P1, P3, P5, P6, P7, P8, P9, P10, P11 & P12) responded to this question by mentioning that administrative, human interaction, business building and innovation focussed type roles will most probably be most negatively impacted. P4 stated that,

> *This is tough to say…as much as research had predicted a reduction in administrative roles at the advent of the 4th IR, we still see admin roles being advertised in the marketplace. But I think that traditional roles and responsibilities will most likely be impacted. Development jobs and HR jobs will be impacted based on the demand for modern skills to develop products for the 4th IR business, and HR to play an important role in providing a workplace that enables people to be the best version of themselves* (Appendix C).

P2 argued that,

> *All jobs within the organisation will be impacted in some way or the other; hence the continuous learning driven across all occupations. Some more than others will require re-skilling, these largely being the more menial jobs; some job may however in future become completely redundant including human facilitated customer service, sales and intermediary support, data entry, claims and administrative support, certain roles in IT and operations* (Appendix C).

Finding 39: Administrative, repetitive function jobs will be most impacted as most of these roles will be replaced by AI

Finding 40: Al may replace many jobs and require people to adapt and learn how to use this technology to enhance existing processes

Finding 41: Development and HR jobs will be impacted based on the demand for modern skills to develop products for the 4th IR business

IQ2.1.3: What jobs are the least likely to be impacted?

Participants (P1, P4, P6, P7, P8, P9, P10, P11 &1 P2) said that HR, IT and specialised jobs like actuarial, brokers, underwiring, procurement and legal types of roles will be least impacted. P5 supported this by stating, “We believe that the delivery of our financial service product is an intermediated moral in terms of the sales process – but most people want a human touch and brokers that they can consult and speak with, so HR and brokers will be least impacted” (Appendix C). P2 mentioned that “Jobs at lowest risk of being automated will be least impacted. This includes jobs which require critical thinking, strong analytical skills, and creativity and more specifically, roles requiring qualifications and experience in computer science, actuarial modelling, engineering, data science and high-tech capabilities” (Appendix C). P3 said that “Highly educated and highly specialised employees are less threatened by unemployment due to automation in contrast to low-skilled staff, whose tasks can be easily automated” (Appendix C).

Finding 42: HR and IT are identified as the jobs that will be least impacted by the 4th IR

Finding 43: People with skills in complex problem solving, creativity, critical thinking and engineering will be least impacted by the 4th IR

IQ 2.1.4. How will employees upskill themselves?

Participants (P1, P3, P4, P5, P8, P10 & P12) mentioned that active and continuous learning are the foundations on which to build when it comes to the 4th IR. P2 stated that "Within the organisation, employees need to be placed in an environment that offers continuous opportunities to learn, grow and refresh skills." P6 also mentioned "Learning new information and new ways of doing things" (Appendix C). P9 said, "By investing in building human skills like active learning and creativity through sustained learning opportunities" (Appendix C). P11 stated, "It will make them more relevant in the workplace" (Appendix C); and P7 said that "by being in the forefront of significant changes in the organisation**"** (Appendix C).

Finding 44: Active and continuous learning are the foundations on which to build when it comes to the 4th IR for employees to learn, grow and refresh skills

Finding 45: AI-based technologies will connect employees to the right content at the right time

Finding 46: Employees will be more relevant in the workplace

Finding 47: The 4th IR will create opportunities for growth and by doing so, will empower employees

SRQ2.2 What are the challenges of 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of the 4th IR?

P1 mentioned that "Advantages – enable a high level of automation of manual tasks, supports higher levels of sophistication in underwriting models and claims processing and provides the opportunity to pivot the business model with potential involvement in ecosystems. Disadvantages – open the industry to a much broader disruptive competitor landscape" (Appendix C). P3 pointed out "Advantages will save cost because we no longer use most of the paperwork, improved customer experience, better value to the customers and disadvantage is that it is costly to implement" (Appendix C). According to P8,

> *Advantages: Flexibility for employees due to remote working, streamlined service delivery to clients, elimination of bottlenecks in client experience journey. Disadvantages: Could take a long while to implement processes as employees might not have the same level of exposure to technology or may be averse to adapting to new processes sought by organisation* (Appendix C).

According to P12,

> *Organisations across various sectors and industries are already enjoying the benefits of digital transformation: It enables businesses to modernise legacy processes, accelerate efficient*

workflows, strengthen security, and increase profitability. While some STI organisations are already reaping the benefits of digitisation – remote-based operations, fast-tracked processes and a more efficient workstreams – the rapid pace of technological advancement will place enhanced customer and client emphasis on personalised, intimate services and engagements (Appendix C).

Finding 48: Advantages: fast-track processes, awareness of customer and flexibility, strengthen security, increase profitability, improve customer experience and save costs

Finding 49: Disadvantages: scarce skills of 4th IR, costly to implement 4th IR related technologies, opens the industry to a much broader disruptive competitor landscape

IQ2.2.2: How will the 4th IR impact employment in your organisation?

Although some participants (P1, P8 & P11) did not indicate the significance of the impact of the 4th IR, eight participants (P2, P3, P4, P5, P6, P7, P9, P10 & P12) agreed that it will have a substantial impact on employment and business. P2 stated that "It will take away huge volume of employment, but it will lead to the need for specialised skills" (Appendix C). P4 agreed by saying, "It will lead to employing more specialist contractors and remote workers and most jobs will become obsolete**"** (Appendix C). P10 explained as "Minimal impact at this point because we are still are largely intermediated business that is dependent on financial advisors/brokers to bring in business" (Appendix C). P12 said that "customers, brokers, underwriters, insurers, reinsurers and claims service providers will all communicate and transfer information in a clear and orderly manner. There will be no such thing as numerous platforms and systems; instead, there will be seamless workflow integration" (Appendix C). P6 argued that,

> *It will have effect between our clients and brokers because customers increasingly demand solutions that are simple, fast, and effortless, yet personalised. These expectations are shaped, not by other life insurance experiences, but their experiences in other industries notably other digital platforms. This means that brokers need to be equally comfortable to serve their customers through physical and digital interactions* (Appendix C).

According to P5,

> *Digital transformation changes the way an organisation operates. Systems, processes, workflow, and culture are all part of this process. This transformation affects every level of an organisation and brings together data across areas to work together more effectively. Our industry has been experimenting with technologies (e.g., blockchain) that facilitate even more unsupervised transactions and hands-off decision making and customer interaction. Coupled with data and data analytics, these technologies are used to support our customer bases, improve margin, and become more competitive. With risk as the fundamental basis for our*

> *business, technology and analytics are helping us understand and explain risk differently. We're thinking differently about who and how we hire; 4th IR is dramatically changing the way business operates* (Appendix C).

P7 mentioned that "As we start embracing technology and become a more technology enabled business, we will need to employ and upskill people with the necessary skills and experience" (Appendix C). P9 pointed out,

> *At this stage of the organisation's digital transformation journey, the intention is not get rid of people but rather to re-train and re-purpose. We do anticipate some people might want to leave the organisation as a result of the fear of the unknown and the fear of thinking they will not fit into the organisation anymore. This couldn't be further from the truth, hence there is very strong change management during the introduction and implementation of these technologies* (Appendix C).

P3 supported this by remarking that the impact is "positive as we have already started hunting for skills and capabilities that are aligned to 4th IR related technologies that bring people and technology together in one ecosystem" (Appendix C).

Finding 50: Automation should drive the theme of less staff required with the opportunity to re-skill and deploy excess capacity in more value adding areas of the business

Finding 51: It will lead to employing more specialist contractors and remote workers

Finding 52: Impact on communication between clients and brokers

Finding 53: There will be an overhaul of skills, determining skill relevance and seeing which employees have skills needed for organisational strategy and an alignment of the employment venture with the skills needed (either by upskilling current employees or hiring people with the relevant skills)

Finding 54: Giving existing and prospective workers greater flexibility in how, when and where they work

Finding 55: Both companies have already started to hunt skills and capabilities that are aligned to 4th IR related technologies

IQ2.2.3. Do you view the 4th IR as a threat or opportunity for your organisation?

Excluding participants P3 and P8, all other participants expressed that they see the 4th IR as a great opportunity. P3 remarked,

> *There certainly are related threats which may speak to the entry of non-traditional competitors in our sector as a result of the platform afforded by technology; we generally however consider this a change in type of competition. Interconnected activity and transfer of data has however*

shone the spotlight on cybersecurity. This is a real threat, and we like many others have had to invest significantly in protecting our own data as well as that of our customers, suppliers, and the rest of our value chain (Appendix C).

P8 stated that, "It is both, it depends on how the organisation will strategize and work around making technology an aspect that employees want to work alongside, and not a threat to their jobs" (Appendix C).

Finding 56: Opportunity to evolve the business and increase sustainability and fit for the future

Finding 57: Great opportunity to grow and survive for the next 100 years as an organisation and to do great things and leave a great legacy as an organisation

Finding 58: Opportunity to unlock further value from the short-term insurance business model

Finding 59: Improved productivity, increased agility, market access collaboration, better customer experience and better customer insights

Finding 60: Opportunity, as it will create new markets and growth opportunities and generate new financial products and services

Finding 61: Opportunity, as it will improve quality of employee lives e.g., remote working

IQ2.2.4. Is your organisation preparing for the 4th IR? If yes, how?

All participants agreed that their organisation has started preparing for the 4th IR. P1 responded, "Yes and it has started exploring, experimenting, and implementing some of the 4th IR technologies i.e., robotics, optical character recognition, AI-enabled technologies like signature comparison and many more. It is also training and building capacity to enable the team to build these technologies inhouse" (Appendix C). P2 said, "Yes, incorporating 4th IR dynamics in forward looking business planning, systematically digitising business processes, involvement in the fintech and ecosystem space" (Appendix C). P4 indicated, "Yes, modernised our legacy operational systems, recruiting skills aligned to the 4th IR, implementing change management initiatives to create the demand for people to change. Implementing new technology (employee app, client app, ChatBot, IoT products)" (Appendix C). P8 noted that "Blended working is already underway and there are constant skill opportunities internally (on SkillSoft and the Santam Learning Academy) to self-manage and to build resilience on all the changing aspects of the industry" (Appendix C). P7 mentioned that "Sanlam has started training and building capacity to enable the team to build these technologies inhouse" (Appendix C). P10 concurred, "Yes, hybrid working is already happening, and Sanlam has embraced Machine learning and Artificial intelligence, we have

what we call eSanlam AI Global Managed Risk Fund where financial planners meet with clients virtually" (Appendix C).

Finding 62: Free trainings (Santam Learning Academy and SoftSkills) are in place for employees to self-manage and build resilience on all the changing aspects of the industry

Finding 63: Implementing change management initiatives to create the demand for people to change

Finding 64: They have adopted AI (eSanlam AI Global Managed Risk Fund) where financial planners meet with clients virtually

Finding 65: Blended working is already underway

Finding 66: Virtual meetings are used more than face-to-face meetings

Finding 67: They have implemented apps (employee app, client App, ChatBot) to communicate with clients, brokers and employees

Finding 68: They are bringing in the 4th IR skills as a function of how they attract talent; they are actively seeking individuals with skill sets with digital competencies

Summary of the findings

A total of 12 participants were interviewed, with 68 findings (Table 4.4) emerging from the interviews. The findings are linked to the research question (RQ), sub-research question (SRQ) and the interview question (IQ), as shown in Table 4.4.

Table 0.5: List of findings, linked to the RQs, SRQs and IQs

RQ	SRQ	IQ	Finding no:	Findings
1	1.1	1.1.1	1	The most important skills are data science, data analytics, data mining, emotional intelligence, leadership skills
1	1.1	1.1.2	2	Workforce readiness for the future of work, a growth mindset, employees who are innovative, creative, resourceful, adaptable, curious and believe in the concept of lifelong learning
1	1.1	1.1.2	3	Re-skilling employees for the new technology to deliver against the rapid encroachments of the 4th IR; this poses a significant challenge for the insurance environment
1	1.1	1.1.2	4	The 4th IR requires employees with a growth mindset, employees who are innovative, creative, resourceful, adaptable and curious
1	1.1	1.1.3	5	The HR team is not involved in the determination of skills shortage in the 4th IR environment
1	1.1	1.1.3	6	IT practitioners
1	1.1	1.1.3	7	It is no longer just HR that plays this role
1	1.2	1.2.1	8	Digital transformation has taken place across all areas of their business, resulting in fundamental changes to the way they operate. Significant external pressure and factors have certainly contributed to this transformation
1	1.2	1.2.1	9	The 4th IR has improved productivity
1	1.2	1.2.1	10	Digitalisation calls for new ways of workplace communication and collaboration
1	1.2	1.2.1	11	There are more workplace flexibility than before (Remote working)

1	1.2	1.2.1	12	The 4th IR has transformed the ways in which businesses compete and interact with their markets
1	1.2	1.2.1	13	Invest more in data analytics
1	1.2	1.2.2	14	Skills barriers and the need for re-skilling
1	1.2	1.2.2	15	New job and position profile required
1	1.2	1.2.2	16	IT infrastructure barriers limiting the rollout of the 4th IR
1	1.2	1.2.2	17	Both companies have started to introduce the 4th IR
1	1.2	1.2.2	18	IT capabilities are human IT skills and IT infrastructure and the influence of these capabilities and resources in the 4th IR transformation is that they will increase efficiency and effectiveness of business processes
1	1.2	1.2.2	19	The 4th IR has increased human productivity as they are able to make smart choices
1	1.2	1.2.2	20	IT capabilities and resources will enable effective digital business strategy
1	1.3	1.3.1	21	Worse outcomes for some employees
1	1.3	1.3.1	22	Some employees lack knowledge of the 4th IR
1	1.3	1.3.1	23	Some jobs may become obsolete which means people may need to be re-trained or re-purposed
1	1.3	1.3.1	24	With the support of new technology, productivity has increased
1	1.3	1.3.1	25	Communications and interaction have changed (e.g., meetings via MS Teams).
1	1.3	1.3.1	26	Exit of the skills, re-skilling is imperative
1	1.3	1.3.1	27	(Hybrid work): employees have the ability to work from anywhere, meaning office space may be a thing of the past.
1	1.3	1.3.2	28	Disrupt labour markets.
1	1.3	1.3.2	29	Digital identity is something that will be insured, and the insurer will be charged to access client identity via technology called 'self-sovereign identity off a blockchain network'
1	1.3	1.3.2	30	Displacement of workers by machines (AI)
1	1.3	1.3.2	31	The insurance industry has been experimenting with technologies like blockchain that facilitate even more unsupervised transactions and decisions
1	1.3	1.3.2	32	Insurance market will become much more competitive, and consumers will have more choice on insurance available
1	1.3	1.3.2	33	There is a lack of skilled employees to deliver the needs of business as a result of the rapid pace and changes introduced by the 4th IR
1	1.3	1.3.2	34	Improved services and product offering in real-time
2	2.1	2.1.1	35	Data analysis and people soft skill programme in place
2	2.1	2.1.1	36	Five force and pestle analysis to respond to market conditions
2	2.1	2.1.1	37	Both organisations have started the journey to implement the 4th IR
2	2.1	2.1.1	38	The Group has embraced AI and ML in a few of its investment solutions such as the Sanlam AI Global Managed Risk Fund
2	2.1	2.1.2	39	Administrative, repetitive function jobs will be most impacted
2	2.1	2.1.2	40	AI may replace many jobs and require people to adapt and learn how to use this technology to enhance existing processes
2	2.1	2.1.2	41	Development and HR jobs will be impacted based on the demand for modern skills to develop products for 4th IR businesses
2	2.1	2.1.3	42	HR and IT are identified as the least impacted jobs
2	2.1	2.1.3	43	People with experience in computer science, data science, actuarial and engineering will be least impacted
2	2.1	2.1.4	44	Active and continuous learning are the foundations on which to build when it comes to the 4th IR for employees to learn, grow and refresh skills
2	2.1	2.1.4	45	AI-based technologies will connect employees to the right content at the right time
2	2.1	2.1.4	46	They will be more relevant in the workplace
2	2.1	2.1.4	47	By creating opportunities for growth
2	2.2	2.2.1	48	Advantages: fast-track processes, awareness of customers, flexibility, strengthened security, increased profitability, improved customer experience, saved cost
2	2.2	2.2.1	49	Disadvantages: scarce skills of the 4th IR, costly to implement 4th IR-related technologies, opens the industry to a much broader disruptive competitor landscape
2	2.2	2.2.2	50	Automation should drive the theme of less staff required with the opportunity to re-skill and deploy excess capacity in more value adding areas of the business

2	2.2	2.2.2	51	It will lead to employing more specialist contractors and remote workers
2	2.2	2.2.2	52	Impact on communication between clients and brokers
2	2.2	2.2.2	53	There will be an overhaul of skills, determining skill relevance and seeing which employees have skills needed by the organisational and in alignment with the employment venture with the skills needed (either by upskilling current employees or hiring people with the relevant skills)
2	2.2	2.2.2	54	Giving existing and prospective workers greater flexibility in how, when and where they work
2	2.2	2.2.2	55	Both companies have already started to hunt skills and capabilities that are aligned to 4th IR related technologies.
2	2.2	2.2.3	56	Opportunity to evolve the business and make it more sustainable and fit for the future
2	2.2	2.2.3	57	Great opportunity to grow and survive for the next 100 years as an organisation and do great things and leave a great legacy as an organisation
2	2.2	2.2.3	58	Opportunity to unlock further value from the short-term insurance business model
2	2.2	2.2.3	59	Improved productivity, increased agility, market access collaboration, better customer experience, better customer insights
2	2.2	2.2.3	60	Opportunity, as it will create new markets and growth opportunities and generate new financial products and services
2	2.2	2.2.3	61	Opportunity, as it will improve quality of employee lives e.g., remote working
2	2.2	2.2.4	62	Free trainings (Santam Learning Academy and SoftSkills) are in place for employees to self-manage and build resilience on all the changing aspects of the industry
2	2.2	2.2.4	63	Implementing change management initiatives to create the demand for people to change
2	2.2	2.2.4	64	Adoption of AI (eSanlam AI Global Managed Risk Fund)
2	2.2	2.2.4	65	Blended working is already underway
2	2.2	2.2.4	66	Virtual meeting (MS Teams) more than face-to-face meetings
2	2.2	2.2.4	67	Communication through apps (employee app, client app, ChatBot)
2	2.2	2.2.4	68	They are bringing in the 4th IR skills as a function of how they attract talent, actively seeking individuals with skills sets with digital competencies

*RQ = Research Question; SRQ = Sub-Research Question; IQ = Interview Question; F# = Finding Number

The 68 findings are used to develop the categories and themes.

Theme development

Themes were developed based on the 68 findings (Table 4.4). The findings were coded and re-coded several times before building the seven categories. Table 4.5 presents the development of seven categories from the findings

Table 0.6: Codes, recodes and categories developed from the findings

Finding No:	Findings	Code	Recode	Categories
1, 4, 44, 50, 52, 55 ,68	The most important skills are data science, data analytics, data mining, emotional intelligence, leadership skills. The 4th IR requires employees with a growth mindset, employees who are innovative, creative, resourceful, adaptable and curious. Active and continuous learning are the foundations from which to build when it comes to 4th IR for employees to learn, grow and refresh skills. Automation should drive the theme of less staff required with the opportunity to re-skill and deploy excess capacity in more value adding areas of the business. It will lead to employing more specialist contractors and remote workers. Both companies have already started to hunt skills and capabilities that are aligned to 4th IR related technologies. They are bringing in the 4th IR	Skills needed in the 4th IR	Skills	Important skills

	skills as a function of how they attract talent, they are actively seeking individuals with skills sets with digital competencies.			
2, 3,15, 33, 40	Re-skilling employees for the new technology to deliver against the rapid pace of 4th IR, this poses a significant challenge for insurance environment. Workforce readiness for the future of work, a growth mindset, employees who are innovative, creative, resourceful, adaptable, curious, concept of 'lifelong learning. They will need to re-skill employees in order to deliver against the rapid pace of 4th IR – this poses a significant challenge. Al will necessarily replace most jobs, but rather, will require people to adapt and learn how to use this technology to enhance existing processes. There is a lack of skilled employees to deliver the needs of business as a result of the rapid pace and the changes introduced by 4th IR	4th IR factors to be considered in determining employment	Factors to be considered	Re-skilling employees
8, 10, 21,22, 23, 28, 31, 42	Worse outcomes for some employees. Some employees lack knowledge of the 4th IR to perform well. Some jobs may become obsolete which means people may need to be re-trained or re-purposed. The insurance industry has been experimenting with technologies like blockchain that facilitate even more unsupervised transactions and decisions. The 4th IR could result in greater inequality, this because of its significant potential to disrupt labour markets. HR and IT are identified as least jobs that will be least impacted by the 4th IR. Digital transformation has taken place across all areas of their business, resulting in fundamental changes to the way they operate. Significant external pressure and factors has certainly contributed to this transformation. Digitalisation calls for new ways of workplace communication and collaboration	4th IR impact	Challenges	Lack of knowledge
13, 35, 62, 63, 64	Free training and learning (Santam Learning academy and SoftSkills) are in place for employees to self-manage and build resilience on the changing aspects of the industry. Implementing change management initiatives to create the demand for people to change. Data analysis and soft skill programmes are in place to support employees. Invested more in data analytics	Preparation of 4th IR	Learning	Training programmes and E-learning
12, 27, 52, 54, 64, 65, 66	The 4th IR has transformed the ways in which businesses compete and interact with their markets (interact with their suppliers, brokers, and customers largely through various technological platforms e.g., MS teams, ChatBot). Hybrid work: They already have the ability to work from anywhere, meaning office space may be a thing of the past. Impact on communication between clients and brokers. They have adopted AI (eSanlam AI Global Managed Risk Fund) where financial planners meet with clients virtually. Giving existing and prospective workers greater flexibility in how, when, and where they work Blended working is already underway. Virtual meetings (MS Teams) occur more than face-to-face meetings	Work-home balance	Communication	Flexibility

4, 9, 47, 56, 57, 58, 59, 60, 61,	Opportunity to evolve the business and make it more sustainable and fit for the future. Great opportunity to grow and survive for the next 100 years as an organisation and to do great things and leave a great legacy as an organisation. Opportunity to unlock further value from the short-term insurance business model. Improved productivity, increased agility, market access collaboration, better customer experience and better customer insights will create new markets and growth opportunities and generate new financial products and services. it will improve quality of employees lives e.g., remote working. The 4th IR will create more opportunities for growth and by doing so, empower employees. The 4th IR has improved productivity.	4th IR opportunities	New opportunities	Opportunities
8, 10, 21, 22, 23, 28, 31, 32, 42, 50, 51	Automation should drive the theme of less staff required with the opportunity to re-skill and deploy excess capacity in more value adding areas of the business. It will lead to employing more specialist contractors and remote workers. Insurance markets will be more competitive, and consumers will have more choice of insurance available to them. The 4th IR could result in greater inequality, because of its significant potential to disrupt labour markets.	4th IR effect on employment	Effect	Effect

Four themes emerged from the seven categories listed in Table 4.5. The themes are shown in Table 4.6 and are linked to the findings, RQ, SRQ and IQs.

Table 0.7: Findings, themes, IQs, SRQ and RQs

Finding Number	Themes	IQs	SRQ	RQ
8, 10, 21, 22, 23, 28, 31, 32, 42, 50, 51	4th IR effect	1.2.1, 1.3.1, 1.3.2, 2.2.2, 1.3.2	1.2, 1.3, 2.2,	1 & 2
9, 47, 56, 57, 58, 59, 60, 61	4th IR opportunities	1.2.1, 2.2.3, 2.1.4	1.2, 2.2, 2.1	1 & 2
1, 4, 44, 50, 55, 68	4th IR skills needed	1.1.1, 1.1.2, 2.1.4, 2.2.2, 2.2.4	1.1, 1.2,1.4	1 & 2
12,13, 27, 52, 54, 62, 63, 64	4th IR preparation	1.2.1, 1.3.1, 2.1.1, 2.2.2, 2.2.4,	1.2, 1.3, 2.2,	1 & 2

*RQ = Research Question; SRQ = Sub-Research Question; IQ = Interview Question; F# = Finding Number

The themes are:

i) 4th IR effects
ii) 4th IR opportunities
iii) 4th IR skills need
iv) 4th IR preparation

Summary

The research was based on a case study and focused on the effect of the 4th IR on employment in the insurance sectors. The businesses chosen are financial service companies operating in Cape Town, South Africa.

Chapter 4 outlined the findings based on data collection from 12 participants. All participants gave consent to collect data for this research study (Appendix C). The findings are then summarised and categorised and themes are developed.

The chapter includes information of the 12 participants from which a total of 68 findings were identified, with seven categories and four themes emerging.

The analysis began by transcribing the recorded interviews. Once transcribed, the transcriptions were emailed to the participants to verify that the transcriptions are correct, and that the intent of the participant is correctly captured. After thoroughly reading the transcriptions several times, codes and concepts were identified. From the seven categories, four themes were developed: i) 4^{th} IR effect; ii) 4^{th} IR opportunities; iii) 4^{th} IR skills needed; and iv) 4^{th} IR preparations.

The study topics, results and themes are explored in Chapter 5 in connection to the body of previous work.

CHAPTER 5: DISCUSSION

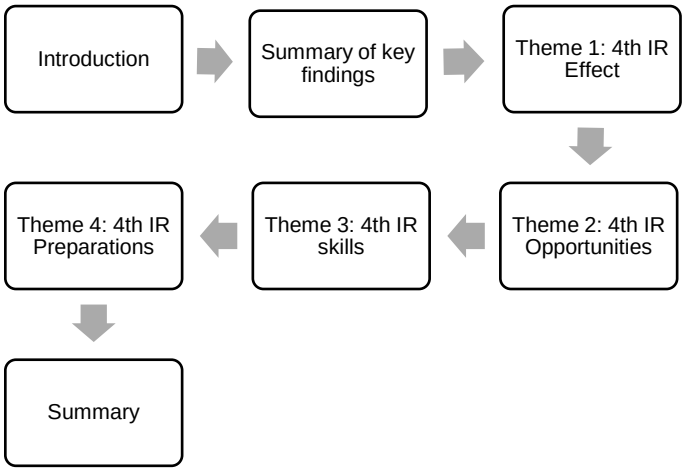

Figure 0.1: Layout of Chapter 5

Introduction

In this chapter (Figure 5.1) the themes as developed from the findings of the study as well as the link to the research questions are discussed. The discussion takes place against the background of the aim of the study, namely, to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa.

Chapter 5 discusses the findings obtained from the transcribed interviews from the insurance sectors. The results are presented according to the research questions, aim and objectives; conclusions have been drawn from the data analysis.

Themes

The following themes are discussed while answering the research question related to the theme: i) 4th IR effect (RQ1 & RQ2; SRQ1.2, SRQ1.3 & SRQ2.2); ii) 4th IR opportunities (RQ1 & RQ2; SRQ1.2, SRQ2.1 & SRQ2.2); iii) 4th IR skills needed (RQ1 & RQ2; SRQ1.1; SRQ1.2, SRQ1.4); and iv) 4th IR preparations (RQ1 & RQ2; SRQ1.2, SRQ1.3, SRQ2.2). The themes are discussed in the following order: i) 4th IR effect, ii) 4th IR opportunities, iii) 4th IR skills needed, and iv) 4th IR preparations.

1.1.45 Theme 1: 4th IR effect

From the findings, the 4th IR effect is identified as a theme (Chapter 4, Table 4.6). Table 4.6 shows the link between the findings and the research questions:

SRQ1.2.) How is the 4thIR transforming business? SRQ1.3) What are the challenges faced by employees in the insurance sector because of 4th IR implementation? SRQ2.2) What are the challenges of the 4th IR in the insurance sector?

The 4th IR introduces dynamic changes that impact enterprises, people and the employment landscape, causing upheaval in society, the economy and industry (Mayer, Wegerle & Oosthuizen, 2021:3857:). From the findings (8, 22, 23, 28, 31, 32, 42, 50 & 51), skills barrier was mentioned as the significant impact of performing well in the 4th IR.

P1 mentioned that "The rapid change the 4th IR is effecting is impacting business models, strategy, and execution. The focus on digital transformation has increased commensurately with a big increase into organisational priority and allocation of resources" (Appendix C). P2 stated,

> *Digital transformation has completely revolutionised the ways in which businesses compete and interact with their markets; the change has taken place across the entire value chain. At Santam, technology is being integrated along the entire employee lifecycle, from recruiting to onboarding and ongoing training, we interact with our suppliers, brokers and indeed customers largely through various technological platforms. Digital transformation has taken place across all areas of our business, resulting in fundamental changes to the way we operate. Significant external pressure and factors has certainly contributed to this transformation* (Appendix C).

The 4th IR will alter people's identities, feelings of privacy, consumption patterns, beliefs about ownership, time spent working and unwinding, as well as how they discover their abilities, advance in their careers, interact with others and build relationships (Schwab et al., 2016). P8 remarked,

> *By influencing the organisation to rethink business models and processes. Technology has resulted in the ability of employees to do their jobs remotely which has resulted in more flexibility in their personal lives, resulting in a richer organisational culture where employees feel trusted by their managers to do their jobs without being looked over the shoulder. Environmental contexts have influenced the organisation to go into the digitisation of paper records due to the real threat of climate change* (Appendix C).

According to P9 argued, "Digitalisation calls for new ways of workplace communication and collaboration and can be understood as the use of digital technologies and data" (Appendix C). P11 mentioned that "As technology becomes much more accessible and affordable, we need to adapt our internal systems and process. This will mean replacing legacy systems, adopt process improvements and invest more in data analytics to understand our customer base and behaviours" (Appendix C).

P10 said, “If technology is implemented it has tremendous effect on the route that our company must take and strategy it must follow as well as new products offerings that it needs to bring” (Appendix C).

In summary, 4th IR traits will have various effects on employment, consequences that will no longer be limited to just one area but will affect all industries. Many jobs will perish at the same time as new employment is generated.

1.1.46 Theme 2: 4th IR opportunities

From the findings, 4th IR opportunities is identified as a theme (Chapter 4, Table 4.6). Table 4.6 shows the link between the findings and the sub-research questions: SRQ 1.2) How is the 4th IR transforming businesses? SRQ 2.1) How does your organisation determine the characteristics and skills required for the 4th IR? SRQ2.2) What are the challenges of the 4th IR in the insurance sector?

According to Ohene-Afoakwa and Nyanhongo (2017), technological developments have enabled new goods and services, enhancing the effectiveness and satisfaction of our private life. The supply-side miracle of technological progress also leads to long-term advances in productivity and efficiency. New technologies have disrupted the value chains of conventional industries and given rise to whole new ways of satisfying current requirements. With the aim of enhancing customer service, consumers are becoming more and more central to the economy and enterprises. Growing customer involvement, openness and new consumer behaviour patterns (which are increasingly focused on access to mobile networks and data) all present possibilities for firms to modify how they create, market and offer goods and services.

From the findings (56, 57, 58, 47, 60 & 61), it is evident that the 4th IR will usher in great opportunity for the organisations. P8 noted that, “It is both, it depends on how the organisation will strategize and work around making technology an aspect that employees want to work alongside, and not a threat to their jobs” (Appendix C). P3 argued,

> *There certainly are related threats which may speak to the entry of non-traditional competitors in our sector as a result of the platform afforded by technology; we generally however consider this a change in type of competition. Interconnected activity and transfer of data has however shone the spotlight on cybersecurity. This is a real threat, and we like many others have had to invest significantly in protecting our own data as well as that of our customers, suppliers, and the rest of our value chain* (Appendix C).

1.1.47 Theme 3: 4th IR skills needed

From the findings, 4th IR skills needed is identified as a theme (Chapter 4, Table 4.6). Table 4.6 shows the link between the findings and the sub-research questions: SRQ1.1: How are employees in the insurance sector ensuring the relevance of their skills within the context of the 4th IR? SRQ1.4: How can the skills needed for the 4th IR be determined in the insurance sector?

The much-needed intellectual advice for developing and implementing smart and digital projects comes from skills, innovation systems and knowledge-based communities (Abdoullaev, 2011; Scholl & Scholl, 2014). E-literacy (e-skills & e-literacy) It has also been identified as crucial to the so-called smart company's success (Manda & Backhouse, 2017). Skills mismatches and redundancy have been cited as difficulties owing to the changing nature of occupations as a result of technological advancements and industrial practices (World Economic Forum, 2016). Furthermore, citizens' abilities to actively participate in social and economic activities in a smart society are influenced by their e-readiness (e-literacy and e-knowledge) (Manda et al., 2017).

According to Florea et al. (2018:55), soft skills are the mindsets, intrinsic qualities, behaviours, and aptitudes that enable people to successfully navigate their environments, collaborate effectively in teams, perform at their best and achieve their objectives. Simply described, soft skills are character traits, motivations, goals and preferences that are appreciated in the workplace (Succi et al., 2019:115).

From the findings (1, 18, 26, 35, 44, 53 & 62) it is evident that the important skills to for the 4th IR are as follows: data science, data analytics, emotional intelligence, leadership skills, data mining, soft skills and human skills (Appendix C). The importance and significance of soft skills are both growing, according to Bak et al. (2019). Hard skills alone are no longer sufficient for workers in the modern world. Additionally, workers require soft skills to advance in their positions (Dogara et al., 2019). Soft skills refer to “a combination of cognitive, metacognitive, interpersonal, and practical capabilities” (Succi et al., 2019:115). P4 admitted,

> *Personally, I feel that there’s a lot of fear that exists in the hearts of employees. This fear is driving behaviour that either promotes acquisition of new skills of the desire to hold onto existing skills to create your own sense of relevant and validity. Therefore, I believe that the ability to overcome challenge, to vision out and create a future (of a process, product, experience, business model, strategy) and not fear failure (or probability of failing) is critical. It’s about the mindset that people will need to embrace to imagine a future that is hopeful, flexible, and human* (Appendix C).

In summary, developing skills and competencies is essential to achieving the potential of the 4th IR. Organisations increasingly value soft skills when hiring new employees.

1.1.48 Theme 4: 4th IR preparations

From the findings, 4th IR preparation is identified as a theme (Chapter 4, Table 4.6). Table 4.6 shows the link between the findings and the sub-research questions: SRQ1.2) How is the 4th IR transforming businesses? SRQ1.3) What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation? SRQ2.2) What are the challenges of the 4th IR in the insurance sector?

The 4th IR is already altering how we live, study and work, and it will continue to do so, according to Kaka (2022). While some occupations could disappear, others might expand, and occupations that do not even exist yet might emerge and become widespread. That timing was most likely greatly accelerated by the Coronavirus outbreak. It is evident that the workforce of the future will require a competence that keeps up with the rapid speed of technology.

From findings (10, 13, 35, 62, 64, 65, 66, 67 & 68), it is evident that the organisations are already preparing for the 4th IR (Appendix C). P8 noted that “Blended working is already underway and there are constant skills opportunities internally (on SkillSoft and the Santam Learning Academy) to self-manage and build resilience on all the changing aspects of the industry” (Appendix C). P7 mentioned that “Sanlam has started training and building capacity to enable the team to build these technologies inhouse” (Appendix C). P10 pointed out that “Hybrid working is already happening, and Sanlam has embraced Machine learning and Artificial intelligence, we have what we call eSanlam AI Global Managed Risk Fund where financial planners meet with clients virtually**”** (Appendix C).

According to Balakrishnan et al. (2022), insurance businesses are modernising their business methods and using digital procedures to improve the policyholder experience, boost productivity and gain a competitive edge. The COVID-19 pandemic increased the need for creative, digital-first business solutions even though many companies in the industry were already looking for new ways to use technology to reinvent their operations. Many fresh insuretech start-ups are creating innovative approaches to produce significant results across the whole insurance value chain. In addition, there has been a surge in interest in technology accelerators with an insurance-specific focus. According to P11,

> *Organisations must take the initiative to improve digital literacy among their workforces, Santam is doing exactly this by availing internally and funding external opportunities for related learning and development programmes. We’re also brining in the skills as a function of how we attract*

talent, we are actively seeking individuals with skills sets with digital competencies. Our overall business strategy integrates digital transformation, this under the direction of our Chief Information Officer. Santam has invested significantly in understand and suitably incorporating changes required to enable digital transformation (Appendix C).

In summary, not all businesses are utilising new technologies to their full potential; in fact, some may not even be aware of how crucial fundamental ideas like digital transformation, business process automation and continuous improvement are to their success and survival. Organisations can develop a digital transformation strategy that will help them continue to compete, grow and thrive in the years to come by learning how to prepare for the 4th IR. This will allow them to extract more value and cost savings from their current processes.

Research questions

1.1.49 RQ 1: What is the effect of the 4th IR on employment in the insurance sectors?

SRQ 1.1: How are employees in the insurance sector ensuring the relevance of their skills within the context of 4th IR?

The rise of the 4th IR requires most employees to adopt new IT and non-IT related skills, both in order to remain employable. In both organisations it is evident that employees are being equipped with 4th IR skills e.g., they have a free Soft skill learning programme available online.

Skillsets are changing, and employees need to be developed to attain these new skills. Therefore, an effort from management is required to drive this initiative. Not having the right skills in the company can have an effect on the digital transformation strategy of the company.

Below are some of the important skills identified:

i) Data science the
ii) Data analytics
iii) Emotional intelligence
iv) Leadership skills
v) Data mining
vi) Soft skills/human skills
vii) Cognitive flexibility

SRQ 1.2: How is the 4th IR transforming businesses?

The successful transformation of companies depends on how management drives digital transformation. However, most agree that digital transformation is important to the company, as they need to set the vision as well as strategies and drive it to the end. This highlights that the vision and strategy are important factors for the company to pursue digital transformation.

SRQ 1.3: What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation?

There are several things that might put employees in risk of automation. Low work experience is one of these factors, which mostly affects individuals who work in repetitive jobs that may be readily automated. Another important aspect is having low levels of education and training. In contrast to low-skilled employees, whose tasks may be readily automated, highly educated and highly specialised workers are less at risk of losing their jobs as a result of automation.

SRQ1.4: How can skills needed for the 4th IR be determined in the insurance sector?

Business owners, and IT with support from HR functionaries, are the primary role players in determining what skills and competencies are required for specific job and roles and as such, are key in determining organisational skills required for the 4th IR.

IT and business relationship is crucial, and it needs to be strengthened if a company wants to survive. The importance of teamwork between IT and business has been evident in the findings. Frequent consultation with industries, needs analysis and open communication are needed to determine the required skills sets.

1.1.50 RSQ 2: How can the 4th IR affect the future of work?

SRQ 2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

Skills requirements tend to follow the actualisation of a business strategy; where, when and how rapidly an organisation intends to move largely determines its skills plan and requirements. It is evident from the findings that both companies have taken the approach of using implementation partners, bringing in experienced people to help with the implementation of new projects while there is knowledge transfer happening to in house resources. The knowledge transfer in this way is one of the best ways to determine the characteristics and skills required by the 4th IR.

SRQ 2.2: What are the challenges of the 4th IR in the insurance sector?

4th IR have an impact on the insurance sector, which is a knowledge-intensive sector. 4th IR changes the impact of production on the environment, employment, and education policies. New business models are formed, and mass productions carried out in a personalised manner. The main challenges facing the insurance sector are i) finding resources with the right skill set, ii) training own employees to acquire the skill set, iii) knowing what changes the 4th

IR is causing, iv) to adapt to those changes and v) to keep their customers part of the 4th IR journey.

The findings also showed that employment can be and impact organisations as follows:

i) There is a lack of skilled employees to deliver the needs of the business as a result of the rapid pace and changes introduced by the 4th IR
ii) Digital transformation has taken place across all areas of their business, resulting in fundamental changes to the business operations; significant external pressure and factors have certainly contributed to this transformation
iii) New forms of collaboration and communication at work are required as a result of digitalisation.
iv) Skills barriers and the need for re-skilling
v) New job and position profiles are required
vi) IT infrastructure barriers limiting the rollout of the 4th IR
vii) IT capabilities and resources will enable effective digital business strategy
viii) Some jobs may become obsolete which means people may need to re-train or re-purpose
ix) The 4th IR could result in greater inequality as a consequence of its significant potential to disrupt labour markets.
x) Digital identity is something that will be insured, and the insurer will be charged to access client identity via technology called self-sovereign identity of a blockchain network
xi) Roles typically human driven, such as claims and customer support, are increasingly redundant as a result of digitisation.
xii) It will lead to employing more specialist contractors and remote workers
xiii) Impact on communication between clients and brokers
xiv) There will be an overhaul of skills, determining skill relevancy and which employees have the skills needed by organisation, with alignment of the employment venture with the skills needed (either by upskilling current employees or hiring people with the relevant skills)

Opportunities identified are:

i) Opportunity to evolve the business and make it more sustainable and fit for the future
ii) Great opportunity to grow and survive for the next 100 years as an organisation and to do great things and leave a great legacy as an organisation
iii) Opportunity to unlock further value from the short-term insurance business model
iv) Improved productivity, increased agility, market access collaboration, better customer experience and better customer insights
v) It will create new markets and growth opportunities and generate new financial products and services
vi) It will improve the quality of employee lives e.g., remote working
vii) The 4th IR will create more opportunities for growth and by doing so, empower employees
viii) The 4th IR has improved productivity

Summary

The conclusions from Chapter 4 were examined in this chapter. The topics were examined in relation to the study's findings and classifications, including references from numerous sources and several participants. Four themes were identified. Based on the findings, the literature review discussed in Chapter 2 is used as a guiding instrument to assist in the recommendations which will be discussed in Chapter 6. The four themes namely, i) 4th IR effects, ii) 4th IR opportunities, iii) 4th IR skills need and iv) 4th IR preparation, have been discussed and research questions answered.

In Chapter 6, the conclusions, research questions, recommendation, limitations, future research, a reflection, and a summary are all presented.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

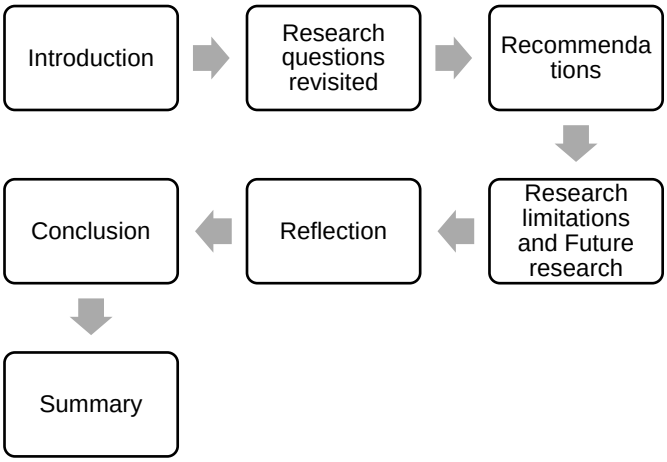

Figure 0.1: Layout of Chapter 6

Introduction

Because of the 4th IR's rapid speed of technological advancement, the financial market structure will alter as a result of digital disruption. Chapter 6 (Figure 6.1) i) outlines the aim and objectives of the study; ii) answers the research questions; iii) presents recommendations; iv) admits the limitations; v) suggests future research; vi) offers a reflection on the study; vii) draws a conclusion; and viii) closes with a summary.

Research questions revisited

In this sub-section, research questions are answered. First the sub-research questions are answered and then the answers of the sub-research questions are used to answer the main research question. The answers are derived from the interpretation of the key findings.

The problem statement concerns the 4th IR effect on employment in the insurance sectors. The aim of the study is to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa, which is answered by the research question as follows.

1.1.51 RQ1: What is the effect of the 4th IR on employment in the insurance sectors?

The effects of the 4th IR on employment in the insurance sectors are as follow:

i) Lack of the necessary skills inside the organisation might affect the company's digital transformation strategy
ii) IT infrastructure barriers limiting the rollout of the 4th IR
iii) Some jobs may become obsolete which means people may need to re-train or re-purpose

iv) There is a lack of skilled employees to deliver the needs of business as a result of the rapid pace and changes introduced by the 4th IR
v) Insurance market will become much more competitive, and consumers will have more choice on available insurance
vi) The development of a new universe of interconnected ecosystems and gadgets as a result of the 4th IR has a significant influence on how insurers develop their products and interact with policyholders.
vii) With South Africa's high unemployment rate, the 4th IR could result in greater inequality, because of its significant potential to disrupt labour markets. As the drive to automate replaces labour across the entire economy, the net displacement of workers by machine has the real and likely potential to exacerbate the gap as relates to availability of select, largely menial jobs, many of which are typically reserved for unskilled labour. The insurance sector is no exception: roles which were typically human driven such as claims and customer support are increasingly redundant because of digitisation.

1.1.52 RSQ 2: How can the 4th IR affect the future of work?

i) The 4th IR will lead to employing more specialist contractors and remote workers
ii) Rapid growth in technological advancements in the workplace will lead to continuous employee training to match the development of machines; workers who will not lose their jobs directly due to automation will have to constantly improve their skills and know-how to remain productive
iii) Remote work will rise
iv) New job and position profiles are required
v) There will be an overhaul of skills, determining which skills relevant and which employees have the skills required by the organisational, aligning the employment venture with the skills needed (either by upskilling current employees or hiring new people with relevant skills)
vi) It will create new markets and growth opportunities and generate new financial products and services
vii) Although most employment may be replaced by artificial intelligence, individuals will need to adapt and learn how to use this technology to improve current procedures

Recommendations

The study's findings indicate numerous possibilities and difficulties related to how the 4th IR may affect employment in the insurance sector. Therefore, the following is a summary of

advice for using the 4th IR successfully to modernise the insurance industries. Following are suggestions for a successful 4th IR transition based on this study:

i) All stakeholders must show commitment and attention to the 4th IR by adopting it and by designing an action plan and strategy that can realise the future of work.
ii) Change management and communication: The study acknowledges that changes will be prevalent in an organisation that aims to transform and stay ahead of its competitors, especially in the 4th IR. But the organisation must remember to take along on the journey its most valuable resource, its staff. It is therefore recommended that the organisation invest in the management of change and communication about change to ensure employees understand the reasons for upcoming change and are prepared for it.
iii) The Human Resource team (HRBP, L&D, Talent management) should be involved in the determination of skills shortages in the 4th IR environment
iv) The organisation must constantly strive to enhance benefits, the physical environment, growth opportunities and culture. This will make an enormous contribution to attracting, developing and retaining scarce-skilled talent.
v) To embrace and sustain the long-term adoption of the 4th IR, a solid digital strategy is necessary. To the contrary, an organisation's digital integrity will endangered and its digital environment may suffer from a poor or non-existent digital roadmap.
vi) How management supports digital transformation will determine how successfully organisations evolve. Although most people concur that digital transformation is crucial for businesses, they must create the vision, plan for the change and see it through.
vii) On the issue of privacy, with all the interconnected activity and transfer of data, the cybersecurity threat cannot be underestimated. Organisations will have to invest heavily to protect their own data and that of their customers if they are to be trusted players in this new ecosystem.
viii) The rate of change in the insurance industry today is substantial and can be difficult for insurance companies to manage. External strategic technology service providers have the knowledge, contacts and ability to support businesses in developing a unique value proposition. To fully explore the expanding business prospects that are currently accessible, this new era calls for fresh thinking and the capacity to use developing technology. The insurance companies that can successfully utilise 4th IR technology will find themselves in a position to guide and shape the industry's future.

Research limitations and future research

The main limitation of the study is that the research is based on two insurance companies, both in Cape Town, South Africa. It is for this reason that no claim is made towards generalisability to any other financial service industries. The study had setbacks in terms of data collection as there were delays in getting permission for data collection from the companies, scheduling of interviews and availability of participants. These challenges were exacerbated by the COVID-19 pandemic.

A focused examination of the actual changes in the workplace is necessary in addition to the expectations and views of key stakeholders regarding the impact of the 4th IR on employment in the insurance sector. Due to the increased acceptance of digital technology and the modifications in working habits brought on by the COVID-19 restrictions, this issue is now much more urgent. More studies need to examine the post-adoption influence on the skills necessary as the reliance on digital technology by various types and sizes of businesses increases.

Reflection

In order to solve the research problem, the study used a case study technique in conjunction with conducting interviews. Exploratory research was undertaken to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa. The 12 participants' interview responses that were pertinent to the topic and used to generate the study's findings and themes were reported as accurately as possible. The results vary depending on the individuals and the organisations they each represent.

The interview process was fraught with challenges, including participants cancelling appointments at the last minute after the researcher worked diligently for weeks to secure interview dates. For interviews that could not be performed in person owing to practical reasons, technological tools like Skype and Microsoft Teams were used. Overall, this stage of the study was exciting since it promoted the researcher's responsibility, desire and devotion. Better time management and multitasking might have improved the study's total turnaround time, among other actions that could have been carried out. The researcher gained practical experience in the area of study as well as a more solid, certain viewpoint on the issue.

Conclusion

In outlining the background for the study, the concept of the 4th Industrial Revolution was introduced. Ndung'u and Signe (2020:68) note that the 4th IR provides a massive opportunity for growth. However, it demands dramatic change in how organisations manage their workforce. The authors maintain that to transition successfully to the 4th IR, organisations must

invest in cultivating the skills and capabilities required to move into a world of automation and artificial intelligence (AI).

Companies' ability to successfully change into digital businesses depends on management ability to lead the process, establish a clear plan and implement governance. When deciding whether to incorporate new 4th IR technologies, the advantages should be thoroughly analysed. Companies find it difficult to acquire the skills necessary to utilise the capabilities of these new technologies due to the rapid rate at which new technologies are being developed. This results in a skills gap.

The study's findings demonstrate the growing significance of digital skills, from fundamental IT literacy to data analytics and programming. The usage and limits of digital technology must be understood by larger business environment, not only in the insurance sector. The research indicates that both individuals and employers should have a variety of talents, with soft skills becoming increasingly important. Higher cognitive abilities are prized in the workplace of the future; therefore, soft skills are viewed as crucial to success.

The literature highlights the importance of business and IT collaboration as well as the necessity of leadership. The usage of technology and its location are crucial to the 4th IR. One of the essential elements for the effective implementation of the 4th IR is a skilled workforce; thus, this is one of the areas where businesses will have to figure out how to skill their present workforce or acquire new skills.

Summary

This research aim is to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa. There are many factors that can contribute to the impact of the 4th IR on employment, some of which are identified as follows: The company's digital transformation plan may suffer from a lack of the necessary skills, and the implementation of the 4th IR may be hampered by IT infrastructure constraints. To pursue 4th IR transformation, a vision and strategy are crucial. Correctly implemented 4th IR has the potential to improve productivity and most of the participants do think the implementation of the 4th IR will have positive economic outcomes within the insurance sector. It will create new markets and growth opportunities and generate new financial products and services.

It was possible to address the problem statement by responding to the research question. This was accomplished by determining the factors that have an impact on employment in Cape Town, South Africa's insurance sector. Similar to how the objective was met, the causes and their impact on the 4th IR were identified.

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APPENDIX A: EXAMPLE OF INDIVIDUAL CONSENT FORM

BUSINESS AND MANAGEMENT SCIENCES, GRADUATE CENTRE FOR MANAGEMENT

INDIVIDUAL CONSENT FOR RESEARCH PARTICIPATION

TITLE OF THE STUDY: The effect of 4th IR on employment in the insurance sectors in Cape Town, South Africa.

NAME OF RESEARCHER: Nosiphelo Buyana

EMAIL: nosiphelobuyana@gmail.com

NAME OF SUPERVISOR: Dr A. De la Harpe

CONTACT DETAILS: 082 448 1058

EMAIL: andre@cencra.com

PURPOSE OF THE STUDY: The aim of the study is to explore the factors that influence the social entrepreneurial skills of the youth in underserved communities, in Cape Town, South Africa.

CONFIDENTIALITY: I have received assurance from the researcher/student that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used only for M Tech Thesis and that my confidentiality will be protected by creating a code for each learner.

ANONYMITY: My identity will be protected by not disclosing my personal details. I will be referred to as a research participant in the research study.

CONSERVATION OF DATA: The data collected will be kept in a secure manner. The researcher will keep data at his office and the offices of the supervisor, Dr de la Harpe. Data will be electronically stored and only the researcher and supervisors will have access to the

data. The school may at any time be given access to the data or be given a report or information session if needed. The data will be collected and stored as per research method fully described by the researcher especially for audit purposes.

VOLUNTARY PARTICIPATION: I am under no obligation to Participants and if I choose to Participants, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will be disregarded.

ACCEPTANCE: I agree to Participants in the above research study conducted by Mieshka Paulse the Faculty of Business and Management Sciences, Graduate Centre for Management at the Cape Peninsula University of Technology, which research is under the supervision of Dr Andre de la Harpe.

If I have any questions about the study, I may contact the researcher or the supervisor. If I have any questions regarding the ethical conduct of this study, I may contact the secretary of the Faculty Research Ethics Committee email WaltersC@cput.ac.za.

Participant's signature: _____
Date:26/10/2022

Researcher's signature: _____

Date: 26/10/2022

APPENDIX B: INTERVIEW GUIDE

Dear Research Participant

Request for permission to conduct an on-site, multiple case semi-structured interview

You are invited to Participants in an on-site semi-structured interview, conducted in fulfilment of a research project for a master's degree within the Faculty of Informatics and Design at the Cape Peninsula University of Technology (herein referred to as 'CPUT').

This research aims are to explore the effect of the 4th IR on employment within the insurance sector in Cape Town, South Africa.

The research project is undertaken by Miss Nosiphelo Buyana, a registered master's student at CPUT. An on-site interview/meeting shall be formally scheduled at a time most convenient to you.

Your participation in this study is entirely voluntary. You have the right to withdraw at any time and for whatever reason, without any penalty whatsoever. The information obtained from the questionnaire shall be treated with full confidentiality and shall only be used for academic purposes. Anonymity shall be maintained, as responses are not identifiable to your organisation. Furthermore, the research project has received ethical clearance from the CPUT's Ethics Committee and therefore has been found to not hold any significant ethical implications.

Sincerely,

Nosiphelo Buyana

INTERVIEW QUESTIONNAIRE

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment**:**
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment:
IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment**:**
SQ1.2: How is the 4th IR transforming the businesses
IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation? Comment:
IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations? Comment:
SQ1.3: What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation?
IQ1.3.1: How do you think the 4th IR will impact employees' lives?

Comment:
IQ1.3.2: What are the potential implications and impact on the insurance sector because of the 4th IR movement? Comment:
RSQ 2: How can the 4th IR affect the future of work?
SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?
IQ2.1.1: What jobs are the most likely to be impacted? Comment**:**
IQ2.1.2: What jobs least likely to be impacted? Comment:
IQ2.1.3: How will the 4th IR empower employees to upskill themselves? Comment:
SQ2.2: What are the challenges of 4th IR in the insurance sector?
IQ2.2.1: What are the advantages and disadvantages of 4th IR? Comment:
IQ2.2.2: How will the 4th IR impact employment in your organisation? Comment:
IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation?

Comment:
IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how? Comment:

Thank you for your time and patience in answering the questions. Your contribution is highly appreciated.

Signature of Student	Date

APPENDIX C: INTERVIEW TRANSCRIPTIONS

Sanlam

Participant 1

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: I would say essentially artificial intelligence and related will be able to replace human intelligence / logic in many business processes and business models. Skills related computing, data mining, extracting value from information, business and innovative skills will become more important.
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: The company should look at their strategy and people strategy and maturity level to embark on a digital transformation journey.
IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment: I think HR practitioner, business, and departments as well as IT managers should be involved.
SQ1.2: How are the 4th IR Industrial Revolution transforming the businesses.
IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation? Comment: The rapid change the 4th IR is effecting is impacting business models, strategy, and execution. The focus on digital transformation has increased commensurately with a big increase into organisational priority and allocation of resources
IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

One of the biggest dependencies is skills, as there aren't much skilled people to develop the 4th IR technologies in the South African Market. As well the IT infrastructure (hardware and software and licenses) is quite expensive.

SQ1.3: What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think the 4th IR will impact employees' lives?

Comment:

Employees will have deal with accelerated pace of change, disruption of business models they are currently operating in as well as possible redundancy of their current skillset with the opportunity to get involved in new opportunities created by the impact of 4th IR.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

The insurance industry is rated as one of the industries the most at risk of disruption. With insuretechs gaining momentum and critical mass the impact of this will be negative if the insurance industry current incumbents are not willing / able to respond or it may create the burning platform required to drive innovation and renewal in this industry.

RSQ 2: How can the 4th IR affect the future of Work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

My organisation has taken the approach of using implementation partners which helps by bringing in experienced people to help with the implementation of these new project while there is knowledge transfer to our inhouse resources

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

Call Centre jobs

Data capturing jobs

IQ2.1.3: What jobs least likely to be impacted? Comment: IT jobs Management jobs
IQ2.1.4: How will the 4th IR empower employees to upskill themselves? Comment: By learning new information and new ways of doing things and also a company should create opportunities for growth
SQ2.2: What are the challenges of the 4th IR in the insurance sector?
IQ2.2.1: What are the advantages and disadvantages of the 4th IR? Comment: Advantages – enables a high level of automation of manual tasks, supports higher levels of sophistication in underwriting models and claims processing and provides the opportunity to pivot the business model with potential involvement in ecosystems. Disadvantages – opens up the industry to a much broader disruptive competitor landscape
IQ2.2.2: How will the 4th IR impact employment in your organisation? Comment: It will create opportunities for growth and learning new ways of doing things.
IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation? Comment: I view it as a great opportunity to grow and survive for the next 100 years as an organisation.
IQ2.2.4: Is your organisation preparing for the fourth industrial revolution? If yes, how? Comment:

Yes, and it has started exploring, experimenting, and implementing some of the 4th IR technologies i.e., Robotics, Optical Character Recognition, AI-enabled technologies like signature comparison and many more. It is also training and building capacity to enable the team to build these technologies inhouse

Participant 2

RQ1: What is the effect of the 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of the 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: For my organisation I would say leadership skills, analytical thinking and IT skills
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: Readiness of employees based on their skills is very important, 4th IR requires people with growth mindset, employees who are ready to take on new challenges and learn
IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment: HR function more specifically on learning and development as well as IT
SQ1.2: How is the 4th IR transforming businesses?
IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation? Comment:

Digital transformation has completely revolutionised the ways in which businesses compete and interact with their markets; the change has taken place across the entire value chain. At Santam, technology is being integrated along the entire employee lifecycle, from recruiting to onboarding and ongoing training, we interact with our suppliers, brokers and indeed customers largely through various technological platforms. Digital transformation has taken place across all areas of our business, resulting in fundamental changes to the way we operate. Significant external pressure and factors has certainly contributed to this transformation.

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment

IT capabilities are crucial enablers of moving an organisation forward on its digital journey. The appropriate IT skills as well business skills that understand how to extract optimal value from a networked world are major dependencies.

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think the 4th IR will impact employees' lives?

Comment:

4th IR has fundamentally changed the way we all live, work, and relate to one another. At an organisation level, one of the main effects of the 4th IR is increased productivity. With the support of technology, we have been able to improve the speed, accuracy, and quality with which select tasks are completed.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

I think with South Africa's high unemployment rate, 4th IR could result in greater inequality, this because of its significant potential to disrupt labour markets. As the drive to automate replaces labour across the entire economy, the net displacement of workers by machine has the real and likely potential to exacerbate the gap as relates to availability of select, largely menial jobs, many of which are typically reserved for unskilled labour. The insurance sector is no exception, roles which were typically human driven such as claims and customer support are increasing redundant as a result of digitisation. Further, South Africa will need to re-skill a significant portion of its population to deliver against the rapid pace of 4th IR this poses a significant challenge for our local context.

RSQ 2: How can the 4th IR affect the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

There is going to be demanded to create completely new job functions and job roles to be able to meet the needs or requirements of the 4th IR. The current IT resources will have to learn new skills and the following will be key skills:

- Application development skills
- Data Science skills
- AI development related skills
- Business analysis skills
- IT testing skills
- Software engineers
- Change Management skills

There are many more skills that will be required, the above is just but a few

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

All jobs within the organisation will be impacted in some way or the other; hence the continuous learning driven across all occupations. Some more than others will require re-skilling, these largely being the more menial jobs; some job may however in future become completely redundant including human facilitated customer service, sales and intermediary support, data entry, claims and administrative support, certain roles in IT and operations.

IQ2.1.3: What jobs least likely to be impacted?

Comment:

Jobs at lowest risk of being automated will be least impacted. This includes jobs which require critical thinking, strong analytical skills, and creativity and more specifically, roles requiring qualifications and experience in computer science, actuarial modelling, engineering, data science and high-tech capabilities

IQ2.1.4: How will the 4th IR empower employees to upskill themselves?

Comment:

Within the organisation, employees need to be placed in an environment that offers continuous opportunities to learn, grow and refresh skills

SQ2.2: What are the challenges of 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of the 4th IR?

Comment:

Advantages

- Cost savings
- Improved efficiencies

Disadvantages

- High cost of implementation
- Scarce skills and having to source skills from offshore which ends up being expensive

IQ2.2.2: How will the fourth industrial revolution impact employment in your organisation?

Comment:

It will take away huge volume of employment, but it will lead to the need for specialised skills

IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation?

Comment:

I view it as a great opportunity to do great things, learn new skills and leave a great legacy as an organisation

IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how?

Comment:

Yes, incorporating 4th IR dynamics in forward looking business planning, systematically digitising business processes, involvement in the fintech and ecosystem space

Participant 3

RQ1: What is the effect of the 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of the 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: The ability to work with new technologies being introduced, the ability to implement, monitor and evaluate the effectiveness of the automation processes for new technologies being introduced & the ability to improve customer experience.
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: Workforce readiness for the future of work certainly is a pronounced agenda item. 4th IR requires employees with a growth mindset, employees who are innovative, creative, resourceful, adaptable, curious; the current transformation and its rapidly evolving nature requires a workforce that subscribes to the concept of 'lifelong learning'.
IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment: This is a conversation largely led by the HR functions, specifically the talent management and acquisition teams. These functions at all times have their ear on the ground in terms of skills demand versus supply – an ever-evolving space. Beyond this, skills acquisition aligns squarely with the strategic direction set by a business, into which markets it is growing, how rapidly it intends to grow and how this business strategy should be resourced. This level of input resides with senior leaders within a company including the CEO and his / her executive committee. The Chief Information Officer will be very close to how this particular area of work is growing / changing and can input on the specifics of what is required to lead or keep up.

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation?

Comment:

The rapid change the 4th IR is effecting is impacting business models, strategy and execution. The focus on digital transformation has increased commensurately with a big increase into organisational priority and allocation of resources

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

IT capabilities and resources will enable effective digital business strategy. And at Sanlam we have IT capabilities that enable high digital transformation in product offering, and services.

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think the 4th IR will impact employees' lives?

Comment:

The employees who are willing and ready to learn will find their jobs being made more efficient by the implementation of the relevant technologies, with the inverse proving true to those unwilling to learn. Streamlined processes may also mean that some employees lose their jobs as the use of human capital will not be needed, then employees will need to upskill to be able to monitor and evaluate the effectiveness of automated processes if they still want to be employed. The impact of 4th IR will be evaluated by how the employees adapt to the various processes being implemented

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

Risks are changing dramatically because of the 4th IR. As a part of these technological developments, insurers are using increasingly diverse data sets and predictive analytics to build future-state risk scenarios with the help of having a technology integration layer that facilitates a wide volume of data.

RSQ 2: How can the 4th IR affect the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?
IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector? Comment: For the insurance industry, and many others, data science and data analytics have been deemed for the future of our sector. At current however, demand far exceeds the supply of suitably qualified and experienced professionals.
IQ2.1.2: What jobs are the most likely to be impacted? Comment: This is tough to say…as much as research had predicted a reduction in administrative roles at the advent of the 4th IR, we still see admin roles being advertised in the marketplace. But I think that traditional roles and responsibilities will most likely be impacted. Development jobs and HR jobs will be impacted based on the demand for modern skills to develop products for the 4th IR business, and HR to play an important role in providing a workplace that enables people to be the best version of themselves.
IQ2.1.3: What jobs least likely to be impacted? Comment: Highly educated and highly specialised employees are less threatened by unemployment due to automation in contrast to low-skilled staff, whose tasks can be easily automated.
IQ2.1.4: How will the 4th IR empower employees to upskill themselves? Comment: By highlighting the potential skills needed for employees to do their jobs more effectively and efficiently through the technological processes that will be implemented.
SQ2.2: What are the challenges of 4th IR in the insurance sector?
IQ2.2.1: What are the advantages and disadvantages of 4th IR? Comment:

Advantages: It will save cost because we no longer use most of the paperwork, improve customer experience, better value to the customers and disadvantage is that it is costly to implement
IQ2.2.2: How will the 4th IR impact employment in your organisation? Comment: Positive as we have already started hunting for skills and capabilities that are aligned to 4th IR related technologies that bring people and technology together in one ecosystem.
IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation? Comment: There certainly are related threats which may speak to the entry of non-traditional competitors in our sector as a result of the platform afforded by technology; we generally however consider this a change in type of competition. Interconnected activity and transfer of data has however shone the spotlight on cybersecurity. This is a real threat, and we like many others have had to invest significantly in protecting our own data as well as that of our customers, suppliers, and the rest of our value chain.
IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how? Comment: Yes, blended working is already underway and there are constant upskilling opportunities internally (on SkillSoft and the Santam Learning Academy) to be able to self-manage and to build resilience on all the changing aspects of the industry.

Participant 4

RQ1: What is the effect of the 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of the 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: Personally, I feel that there's a lot of fear that exists in the hearts of employees. This fear is driving behaviour that either promotes acquisition of new skills of the desire to hold onto existing skills to create your own sense

of relevant and validity. Therefore, I believe that the ability to overcome challenge, to vision out and create a future (of a process, product, experience, business model, strategy) and not fear failure (or probability of failing) is critical. It's about the mindset that people will need to embrace to imagine a future that is hopeful, flexible, and human.

IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR?

Comment:

I would say the process of developing and implementing a digital strategy

IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation?

Comment:

I think HR, do to recruitment, EXCO, signing off of approval and management, to sit in the interviews to source the perfect applicant as well as IT, guidance

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation?

Comment:

Digital transformation calls for new ways of workplace communication and collaboration, and can be understood as the use of digital technologies and data

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

One of the main effects of 4th IR is increased human productivity. With technologies like AI and automation augmenting our professional lives, we're able to make smart choices, faster than ever before. But it's not all rosy, and we're not trying to sugar coat things

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think the 4th IR will impact employees' lives?

Comment:

The workers that will be most affected by the 4th IR will be those that may now feel invulnerable to competition with robots, that is, those whose jobs require moderate skills such as customer service that could be easily replaced by artificial intelligence.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

Ability to price products for vehicles that will do more km's than the average in the past. With the rise of electric vehicles, mechanical parts in vehicles will be reduced because the less moving parts equals less maintenance. How we insure vehicles that will maintained/services via software update will change our business model. This also opens a door to unauthorised hackers and cyber threats gaining access to vehicles and overriding drivability.

RSQ 2: How can the 4th IR Impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

I would say business owners with support from HR functions are the primary role players in determining what skills and competencies are required for specific job families and roles and as such will the role players in determining organisational skills required for 4th IR

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

Call centre and admin work

IQ2.1.3: What jobs least likely to be impacted?

Comment:

IT and HR jobs

IQ2.1.4: How will the 4th IR empower employees to upskill themselves?

Comment:

Invest in building human skills like active learning and creativity through sustained learning opportunities

SQ2.2: What are the challenges of the 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of the 4th IR?

Comment:

Advantages:

- Flexibility for employees and learning new skills.

Disadvantage

- They are often cross-functional projects with many stakeholders, which can mean projects can become mired in conflicting goals and may simply spit out.

IQ2.2.2: How will the 4th IR impact employment in your organisation?

Comment:

It will lead to employing more specialist contractors and remote workers and most jobs will become obsolete

IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation?

Comment:

I view it as an opportunity as it will raise income and new skills

IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how?

Comment:

Yes, modernised our legacy operational systems, recruiting skills aligned to the 4th IR, implementing change management initiatives to create the demand for people to change. Implementing new technology (Employee App, Client App, ChatBot, IoT products).

Participant 5

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: Technical skills like data analytics, data is very important on how they will make decisions and how operate within the organisations. Data analytics skills become more important.
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: I would say re-skilling of employees for the new technology must be a priority.
IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment: I think Line Managers, HR (People Development, Learning & Development, Training, Recruitment, Organisational Effectiveness, Talent Management, and HR business partners) as well as employees should be involved
SQ1.2: How is the 4th IR transforming businesses?
IQ1.2.1: How do technology, organisational, environmental contexts influence digital Transformation in your organisation?

Comment:

The rapid change the 4th IR is effecting is impacting business models, strategy and execution. The focus on digital transformation has increased commensurately with a big increase ito organisational priority and allocation of resources.

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

New job profile required, and new positions required, and HR must transform, and HR practices needs to be more versatile. Virtual mobility has increased in terms of skills.

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

unfortunately, there are some people who may be left behind due to the fast-paced technology gets produced and they may not have the acumen to understand the 4th IR technologies and as well some jobs may become obsolete which means people may need to re-trained or re-purposed.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

Some jobs will become obsolete, some jobs will have to be redefined as well as the environments will change. We already have the ability to work from anywhere, meaning office space may be a thing of the past. A lot of change is coming and some of the change is happening already.

RSQ 2: How can the 4th IR impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

My organisation has taken the approach of using implementation partners which helps by bringing in experienced people to help with the implementation of these new project while there is knowledge transfer to our inhouse resources. Key characteristics is enthusiasm and innovative minds are key and the ability to fail fast.

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

I would say jobs that involve a high level of physical work and repetitive tasks.

IQ2.1.3: What jobs least likely to be impacted?

Comment:

We believe that the delivery of our financial service product is an intermediated moral in terms of the sales process, but most people want a human touch and brokers that they can consult and speak with, so HR and brokers will be least impacted

IQ2.1.4: How will 4th IR empower employees to upskill themselves?

Comment:

Sanlam has introduced new free soft skills online where employees can take part anytime, they want.

SQ2.2: What are the challenges of the 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of 4th IR?

Comment:

Advantages:

- It will bring new opportunities
- Offer new products to the company

Disadvantages:

Costly to implement

IQ2.2.2: How will the 4th IR impact employment in your organisation? Comment: Digital transformation changes the way an organisation operates. Systems, processes, workflow, and culture are all part of this process. This transformation affects every level of an organisation and brings together data across areas to work together more effectively. Our industry has been experimenting with technologies (e.g., blockchain) that facilitate even more unsupervised transactions and hands-off decision making and customer interaction. Coupled with data and data analytics, these technologies are used to support our customer bases, improve margin, and become more competitive. With risk as the fundamental basis for our business, technology and analytics are helping us understand and explain risk differently. We're thinking differently about who and how we hire; 4th IR is dramatically changing the way business operates.
IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation? Comment: I see it as an opportunity as it will improve quality of our lives e.g., remote working
IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how? Comment: Yes, Hybrid working is already happening, and Sanlam has embraced Machine learning and Artificial intelligence, we have what we call e Sanlam AI Global Managed Risk Fund where financial planners meet with clients virtually.

Participant 6

RQ1: What is the effect of the 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of the 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment:

I would say the skills that are going to be more important are Innovative thinking, analytical minds, EQ, ability to collaborate and Initiative skills.

IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR?

Comment:

Technology being used (legacy or modern applications), process management and process engineering, current skills that employees have banked in the repertoire. In addition to this, I believe that the desire of the leadership team and decision makers at the top determine whether an organisation is going to do enough to stay relevant and respond to market changes or drive market change.

IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation?

Comment:

This is a conversation largely led by the human resource functions, specifically Talent Management and Talent Acquisition; these functions at all times have their ear on the ground in terms of skills demand versus supply – an ever-evolving space. Beyond this, skills acquisition aligns squarely with the strategic direction set by a business, into which markets it is growing, how rapidly it intends to grow and how this business strategy should be resourced

.

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation?

Comment:

Digital transformation has taken place across all areas of our business, resulting in fundamental changes to the way we operate. Significant external pressure and factors has certainly contributed to this Transformation, any business in our sector would struggle to maintain relevance in the absence of digital transformation – the world has moved I this direction and business serves as microcosm of its environmental context.

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

As we deploy more platform / app-based solutions, customised to our customer needs, we will need more specialised skills.

SQ1.3: What challenges are faced by employees in the insurance sector as a result of the 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

Immersive training through 3D modelling, virtual reality and the metaverse will impact how we interact with training content and socially with each other as we work in what we currently call the "hybrid workplace".

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

The insurance market will become much more competitive, and consumers will have more choice on insurance available to them. It will also be much more accessible, especially with a younger customer base that is technology savvy.

RSQ 2: How can the 4th IR impact the future of work?
SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?
IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector? Comment: Skills requirements tend to follow the actualisation of a business strategy; where, when and how rapidly an organisation intends to move largely determines its skills plan and requirements.
IQ2.1.2: What jobs are the most likely to be impacted? Comment: I would say administrative jobs will be more impacted
IQ2.1.3: What jobs least likely to be impacted? Comment: I think specialised jobs like actuarial, underwiring, procurement will be least impacted
IQ2.1.4: How will 4th IR empower employees to upskill themselves? Comment:

By learning new information and new ways of doing things

SQ2.2: What are the challenges of 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of 4th IR?

Comment:

4th IR is a disruptor and will take significant cultural change to embrace fully, but once embedded, it can provide competitive advantage to our business.

IQ2.2.2: How will the 4th IR impact employment in your organisation?

Comment:

It will have effect between our clients and brokers because customers increasingly demand solutions that are simple, fast, and effortless, yet personalised. These expectations are shaped, not by other life insurance experiences, but their experiences in other industries notably other digital platforms. This means that brokers need to be equally comfortable to serve their customers through physical and digital interactions.

IQ2.2.3: Do you view 4th IR as a threat or opportunity for your organisation?

Comment:

Definitely an opportunity to evolve the business and make it more sustainable and fit for the future.

IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how?

Comment: Yes, but on a very small scale and within certain parts of the business such as in Claims Services. There is a big focus here to look at skills of the future.

Participant 7

RQ1: What is the effect of the 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: For my organisation I would say skill needed is emotional intelligence (EI). In a space like financial planning, where understanding your client's emotional needs is critical in helping them feel secure, this is an especially important human skill.
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: The availability of technical skills, soft skills, & entrepreneurial skills within the employees.
IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment:

IT practitioners plays a role in determination of skills shortages in 4th IR environment

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital Transformation in your organisation?

Comment:

Digital transformation has taken place across all areas of the business, resulting in fundamental changes to the way we operate. Significant external pressure and factors has certainly contributed to this transformation.

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

In my organisation we have high IT capabilities in place that will help us create digital transformation by redesigning and rethinking existing business processes and by transforming traditional product, service and customer offerings to digital offerings.

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

As things become automated there will be more efficiencies and people will not be required to do mundane tasks that can be done by software bots and AI-enabled technologies

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

Digital identity is something that will be insured soon, and the insurer will be charged to access its clients identity via technology called self-sovereign identity off a blockchain network. This will dramatically shift insurance and any other industry that requires client/customer information to conduct targeted advertisements and sales.

RSQ 2: How can the 4th IR impact the future of work?
SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?
IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector? Comment: My organisation has started on the journey of implementing 4th IR related technologies. By looking at re-evaluating our operations and how we do business. Big data and analytics will be central to everything - from product development, supply-chains to the customer experience
IQ2.1.2: What jobs are the most likely to be impacted? Comment: For example, Faxes – we no longer have fax machines; each employee have the fax number where the fax comes directly to your computer and emails has taken over so admin related jobs will be most impacted
IQ2.1.3: What jobs least likely to be impacted? Comment: I think people with skills in complex problem solving, creativity, critical thinking and engineering will be least impacted by the 4th IR
IQ2.1.4: How will 4th IR empower employees to upskill themselves? Comment: By being in the forefront of significant changes in the organisation.
SQ2.2: What are the challenges of 4th IR in the insurance sector?
IQ2.2.1: What are the advantages and disadvantages of 4th IR? Comment:

While some insurance organisations are already reaping the benefits of digitisation – remote-based operations, fast-tracked processes and a more efficient workstreams, the rapid pace of technological advancement will place enhanced customer and client emphasis on personalised, intimate services and engagements
IQ2.2.2: How will the 4th IR impact employment in your organisation? Comment: As we start embracing technology and become a more technology enabled business, we will need to employ and upskill people with the necessary skills and experience
IQ2.2.3: Do you view 4th IR as a threat or opportunity for your organisation? Comment: I view it as an opportunity to unlock further value from the short-term insurance business model
IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how? Comment: Sanlam has started training and building capacity to enable the team to build these technologies inhouse

Santam

Participant 8

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: With the advancement of technology, the current skills that are required by the financial industry are shifting and changing because technology is creating a space where more simplified work are monotonous work is

being channelled through to technology such as robotics, where robots are doing more simple work which then means the shift of the skills that are required for people becomes more advanced, advanced in the sense that if monotonous work is no longer done people then people needs to deal with more intelligent work that requires a certain element of being more decisive taking better ownership and having higher sense of judgement at times if they interact with clients to be emotionally intelligent to understand how to operate with clients. I would say data analytics skills are more important.

IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR?

Comment:

I would say the availability of technical skills, soft skills & entrepreneurial skills within the employees are factors to be considered.

IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation?

Comment:

The Learning & Development department as well as the HR department within the organisation.

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation?

Comment:

By influencing the organisation to rethink business models and processes. Technology has resulted in the ability of employees to do their jobs remotely which has resulted in more flexibility in their personal lives, resulting in a richer organisational culture where employees feel trusted by their managers to do their jobs without being looked over the shoulder. Environmental contexts have influenced the organisation to go into the digitisation of paper records due to the real threat of climate change

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

Capabilities and resources will enable effective digital business strategy, and at Sanlam we have IT capabilities that enable high digital transformation in product offering, and services

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

Due to the continuous technological development, online social media, such as, Twitter, LinkedIn and Facebook are becoming more and more active. Everyone is able to express and highlight their views about any contemporary incident or event easily before the world through these social media platforms.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

The negative impact is that some jobs will become obsolete; some jobs will have to be redefined as well as the environments will change. We already have the ability to work from anywhere, meaning office space may be a thing of the past. A lot of change is coming and some of the change is happening already

RSQ 2: How can the 4th IR Impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

Our strategy department conducts an annual five forces analysis coupled with a pestle analysis to determine the macro and micro factors that influence and impact the organisations capability to respond to the market conditions.

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

I think jobs that involve admin work will be most impacted.

IQ2.1.3: What jobs least likely to be impacted?

Comment:

At Santam we believe that the delivery of our financial service product is an intermediated moral in terms of the sales process– but most people want a human touch and brokers that they can consult and speak with, so HR and brokers will be least impacted.

IQ2.1.4: How will 4th IR empower employees to upskill themselves?

Comment:

We will need immersive upskilling activities through virtual reality and simulated experiences in the metaverse. AI based technologies will connect us to the right content at the right time to ensure that we know what we need to know when it's important through wearables, biotech and IoT

SQ2.2: What are the challenges of 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of the 4th IR?

Comment:

Advantages: Flexibility for employees due to remote working, streamlined service delivery to clients, elimination of bottlenecks in client experience journey. Disadvantages: Could take a long while to implement processes as employees might not have the same level of exposure to technology or may be averse to adapting to new processes sought by organisation

IQ2.2.2: How will the 4th IR impact employment in your organisation?

Comment:

4th IR will challenge our business to start a new business that is not dependent on the current technology stack to reach new customers with different needs that need a different method of communication to market, advertise and sell to them.

IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation?

Comment:

It is both, it depends on how the organisation will strategize and work around making technology an aspect that employees want to work alongside, and not a threat to their jobs

IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how?

Comment:

Yes, blended working is already underway and there are constant skills opportunities internally (on SkillSoft and the Santam Learning Academy) to be able to self-manage and to build resilience on all the changing aspects of the industry.

Participant 9

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: Critical thinking, not being critical but really a mind that considers options and the imagination. Humanity, this is not only important for how we interact with each other but will influence how closely we consider the customers' requirements in our product design and development. Lastly, I still believe that bold problem solving is a crucial skill that we need to tackle wicked societal problems in the world that insurance has the ability to solve.
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: With South Africa's high unemployment rate, 4th IR could result in greater inequality, this as a consequence of its significant potential to disrupt labour markets. As the drive to automate replaces labour across the entire economy, the net displacement of workers by machine has the real and likely potential to exacerbate the gap as relates to availability of select, largely menial jobs, many of which are typically reserved for unskilled labour. The insurance sector is no exception, roles which were typically human driven such as claims and customer support are increasing redundant as a result of digitisation. Further, South Africa will need to re-skill a significant portion of its population to deliver against the rapid pace of 4th IR – this poses a significant challenge for our local context.
IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment: Human resource management are the key role player in determining skills shortages

SQ1.2: How is the 4th IR transforming the businesses
IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation? Comment: Digitalisation calls for new ways of workplace communication and collaboration and can be understood as the use of digital technologies and data
IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations? Comment: One of the main effects of the 4th IR is increased human productivity. With technologies like AI and automation augmenting our professional lives, we're able to make smart choices, faster than ever before.
SQ1.3: What are the challenges faced by employees in the insurance sector as a result of 4th IR implementation?
IQ1.3.1: How do you think 4th IR will impact employees' lives? Comment: Workers that will be most affected by the 4th IR will be those that may now feel invulnerable to competition with robots, that is, those whose jobs require moderate skills such as customer service that could be easily replaced by artificial intelligence
IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement? Comment: The insurance industry has been experimenting with technologies (e.g., blockchain) that facilitate even more unsupervised transactions and decisions. Coupled with data and data analytics, these technologies are dramatically changing the way business operates. In addition to the obvious technology reliance and resilience risks, these shifts introduce a completely new set of risks to a company
RSQ 2: How can the 4th IR impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?
IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector? Comment: By looking at the current organisational strategy, what outputs the organisation is looking to achieve at a financial, social and environmental level and then building the list of skills needed from our employees to achieve those goals.
IQ2.1.2: What jobs are the most likely to be impacted? Comment: Obviously Administrative jobs will be mostly impacted.
IQ2.1.3: What jobs least likely to be impacted? Comment: With the 4th IR, themes of digitisation, artificial intelligence, robotic process automation, IOT, administrative and structured logic roles will most probably be least impacted.
IQ2.1.4: How will 4th IR empower employees to upskill themselves? Comment: By investing in building human skills like active learning and creativity through sustained learning opportunities
SQ2.2: What are the challenges of 4th IR in the insurance sector?
IQ2.2.1: What are the advantages and disadvantages of the 4th IR? Comment: I would say an advantage is that online jobs provide people to work from and earn at home and disadvantage will be people overuse data and connections is overloading the network services.
IQ2.2.2: How will the 4th IR impact employment in your organisation?

Comment:

At this stage of the organisation's digital transformation journey, the intention is not got rid of people but rather to re-train and re-purpose. We do anticipate some people might want to leave the organisation as a result of the fear of the unknown and the fear of thinking they will not fit into the organisation anymore. This couldn't be further from the truth, hence there is very strong change management during the introduction and implementation of these technologies

IQ2.2.3: Do you view the 4th IR as a threat or opportunity for your organisation?

Comment:

Opportunity, as it will improve quality of employees lives e.g., remote working.

IQ2.2.4: Is your organisation preparing for the fourth industrial revolution? If yes, how?

Comment:

Yes, blended working is already underway and there are constant skills opportunities internally (on SkillSoft and the Santam Learning Academy) to be able to self-manage and to build resilience on all the changing aspects of the industry

Participants 10

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: The future workforce, and to a great extent current workforce, will in line with 4th IR be required to possess stronger technological, data and analytical skills. There will however I envision be a stronger balance in the requirement of technical skills as a result of increased automation / digitisation together with what are typically referred as soft skills i.e., critical and creative thinking, adaptability and broad-ranging predictive idea generation.

IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR?

Comment:

Factors that need to be considered is employee's functional skills, soft skills and candidate ability to function and add value in a networked world

IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation?

Comment:

Human Resource team HRBP, L&D, Talent management) should be involved in determination of skills shortage in 4th IR environment

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital Transformation in your organisation?

Comment:

If technology is implemented, it has tremendous effect on the route that our company must take and strategy it must follow as well as new products offerings that it needs to bring.

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

New job profile will be required, and new positions will also be required, and HR must transform as well as HR practices needs to be more versatile. Also, Virtual mobility has increased in terms of skills

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

Positive I think because we don't need to stand on the road and waiting for transportations, we can book cars or vehicles online (via Bolt, Uber or Indrive) they will be available at our doorstep.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

The insurance market will become much more competitive, and consumers will have more choice on insurance available to them. It will also be much more accessible, especially with a younger customer base that is technology savvy.

RSQ 2: How can the 4th IR impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

We have various teams within Santam specifically dedicated to People Development, Talent Management and Talent Acquisition who solution for the skills the organisation requires immediately as well as in future in line with the ever-changing market and the position we want to maintain therein.

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

Non-administrative, human interaction, business building, innovation focussed type roles will most probably be most impacted.

IQ2.1.3: What jobs least likely to be impacted?

Comment:

Human resources work, brokers, and IT specialised employees.

IQ2.1.4: How will 4th IR empower employees to upskill themselves?

Comment: I think 4th IR will emphasise self-employment.
SQ2.2: What are the challenges of 4th IR in the insurance sector?
IQ2.2.1: What are the advantages and disadvantages of 4th IR? Comment: Advantages – it requires urgency for change and to change, awareness of the next phase of competition, awareness of how customers are behaving in the future. Disadvantages – costly to implement 4th IR related technologies, scarce skills
IQ2.2.2: How will the 4th IR impact employment in your organisation? Comment: Minimal impact at this point because we are still are largely intermediated business that is dependent on financial advisors / brokers to bring in business."
IQ2.2.3: Do you view fourth industrial revolution as a threat or opportunity for your organisation? Comment:
IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how? Comment: Yes, hybrid working is already happening, and Sanlam has embraced Machine learning and Artificial intelligence, we have what we call eSanlam AI Global Managed Risk Fund where financial planners meet with clients virtually

Participant 11

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of the 4th IR?

IQ1.1.1: Which skills are going to become more important for staff in the 4th IR?

Comment:

Typical technical skills required across sectors include computer programming, coding, project management - technology-based skills. Together with this as indicated, employees are increasingly expected to have strong soft skills which at current cannot be programmed into machines, cannot be digitised, these being inherent to humans such as leadership, a growth mindset, cultural awareness, innovation and creativity.

IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR?

Comment:

The following are the factors to be considered: a progressive culture, embraces change, agile work environment, promotes culture of continuous learning.

IQ1.1.3: Which role-players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation?

Comment:

It is no longer just HR that plays this role. It should be driven by line managers and supported by the executive management teams as well

SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital

Transformation in your organisation?

Comment:

I would say as technology becomes much more accessible and affordable, we need to adapt our internal systems and process. This will mean replacing legacy systems, adopt process improvements and invest more in data analytics to understand our customer base and behaviours

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

I have no sight of this area of work and as a result cannot answer this question.

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

Adapt or die basically. We have not fully understood and embraced the 4th IR and there is already talk of a 5th IR. Employees will need to adapt skills and attitude to remain relevant in the workplace

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

4th IR may create improved service and product offering and this can be done in real-time or in shorter turn-around times.

RSQ 2: How can the 4th IR Impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

At Santam we have an online programme on Skills soft by Gartner that monitor the skills of employee it's a free programme available to everyone

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

I'm not sure as it depends on the company strategy, but I would say administrative jobs will be most impacted

IQ2.1.3: What jobs least likely to be impacted?

Comment:

I think HR jobs

IQ2.1.4: How will 4th IR empower employees to upskill themselves?

Comment:

It will make them more relevant in the workplace

SQ2.2: What are the challenges of the 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of 4th IR?

Comment:

On my organisation advantages it has improved SLA's and customer experience and the disadvantage is that these technologies are still very new and have not yet stood the test of time.

IQ2.2.2: How will the 4th IR impact employment in your organisation?

Comment:

Positively. We have already started hunting for skills and capabilities that are aligned to 4th IR related technologies that bring people and technology together in one ecosystem.

IQ2.2.3: Do you view 4th IR as a threat or opportunity for your organisation?

Comment:

For me and the company I would say it's a great opportunity because 4th IR is enhancing the facilities for the development as well as innovation of new skills and 4th IR emphasises growth of knowledge and thirsts for learning.

IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how?

Comment:

Organisations must take the initiative to improve digital literacy among their workforces, Santam is doing exactly this by availing internally and funding external opportunities for related learning and development programmes. We're also brining in the skills as a function of how we attract talent, we are actively seeking individuals with skills sets with digital competencies. Our overall business strategy integrates digital transformation, this under

the direction of our Chief Information Officer. Santam has invested significantly in understand and suitably incorporating changes required to enable digital transformation.

Participant 12

RQ1: What is the effect of 4th IR on employment in the insurance sectors?
SQ1.1: How are employees in the insurance sector going about to ensure the relevance of their skills within the context of 4th IR?
IQ1.1.1: Which skills are going to become more important for staff in the 4th IR? Comment: The following skills will be more important: • Data Science skills • AI development related skills • Business analysis skills • IT testing skills
IQ1.1.2: What are the factors to be considered in determining the employment readiness in your organisation for the 4th IR? Comment: I think re-skilling employees for the new technology is an important factor
IQ1.1.3: Which role players should be involved in the determination of skills shortages for employability in the 4th IR environment in your organisation? Comment: I think management need to set the vision and strategy of the digital transformation and drive it to the end.
SQ1.2: How is the 4th IR transforming businesses?

IQ1.2.1: How do technology, organisational, environmental contexts influence digital transformation in your organisation?

Comment:

My organisation takes guidance from the trends in those domains and implements digital transformation initiatives that bring the organisation in line with the industry.

IQ1.2.2: What are the IT capabilities and resource dependencies for your organisation? How do these influence 4th IR transformations?

Comment:

IT capabilities are Human IT skills and IT infrastructure and the influence of these capabilities and resources in 4th IR Transformation is that they will increase efficiency and effectiveness in our business process

SQ1.3: What challenges are faced by employees in the insurance sector as a result of 4th IR implementation?

IQ1.3.1: How do you think 4th IR will impact employees' lives?

Comment:

Communications and interaction be it with fellow co-workers, or customers, suppliers and intermediaries has completely changed; video platforms allow us to work from home or anywhere else in the world.

IQ1.3.2: What are the potential implications and impact on the insurance sector as a result of the 4th IR movement?

Comment:

I can only see positive impacts, as this will enable the South African insurance sector to compete at a global stage.

RSQ 2: How can the 4th IR impact the future of work?

SRQ2.1: How does your organisation determine the characteristics and skills required for the 4th IR?

IQ2.1.1: How can the skills needed for the 4th IR be determined in the insurance sector?

Comment:

By looking at current business strategy and re-skilling employees.

IQ2.1.2: What jobs are the most likely to be impacted?

Comment:

For my company, I think the call centre will be most impacted as well admin jobs

IQ2.1.3: What jobs least likely to be impacted?

Comment:

I think all jobs if 4th IR is implemented correctly and successfully and that depends on how management drives digital transformation

IQ2.1.4: How will 4th IR empower employees to upskill themselves?

Comment:

As administrative and routine tasks can be automated, it will leave more capacity for employees to focus on value adding, stimulating and innovative areas of work

SQ2.2: What are the challenges of 4th IR in the insurance sector?

IQ2.2.1: What are the advantages and disadvantages of 4th IR?

Comment:

Organisations across various sectors and industries are already enjoying the benefits of digital transformation: It enables businesses to modernise legacy processes, accelerate efficient workflows, strengthen security, and increase profitability. While some STI organisations are already reaping the benefits of digitisation – remote-based operations, fast-tracked processes and a more efficient workstreams – the rapid pace of technological advancement will place enhanced customer and client emphasis on personalised, intimate services and engagements

IQ2.2.2: How will the 4th IR impact employment in your organisation?

Comment:

There will be clean hand-offs and interactions between customers, brokers, underwriters, insurers, reinsurers, and claims providers. The concept of multiple systems and platforms will disappear, replaced by seamless workflow integration

IQ2.2.3: Do you view 4th IR as a threat or opportunity for your organisation?

Comment:

Great opportunity to grow and survive for the next 100 years as an organisation and to do great things and leave a great legacy as an organisation.

IQ2.2.4: Is your organisation preparing for the 4th IR? If yes, how?

Comment:

Yes, as we are bringing in the 4th IR skills as a function of how they attract talent, they are actively seeking individuals with skills sets with digital competencies.

APPENDIX D: EDITORS CERTIFICATE

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To Whom It May Concern

This is to certify that "**THE EFFECT OF THE FOURTH INDUSTRIAL REVOLUTION ON EMPLOYMENT IN THE INSURANCE SECTOR IN CAPE TOWN, SOUTH AFRICA**" by **Nosiphelo Buyana,** for the Faculty of Business and Management Sciences at the Cape Peninsula University of Technology (CPUT), under the supervision of Dr Andre de la Harpe, has been professionally edited by Dr. Laura Budler Kleinhans of ChickPea Proofreading and Editing Services for Students and Professionals.

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CEO ChickPea Proofreading & Editing

APPENDIX E: EXAMPLE OF SUMMARY OF RESPONSES OF PARTICIPANTS LINKED TO IQS

Summary%20of%20
responses%20of%2(