An Explorative Study on the Effects of The Fourth Industrial Revolution on Employment in Small, Medium and Micro Enterprises

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An Explorative Study on the Effects of The Fourth Industrial Revolution on Employment in Small, Medium and Micro Enterprises

by

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Abstract

The onset of the Fourth Industrial Revolution impacted most facets of life. As a services revolution, which was brought about by the merging of various sectors and phenomena such as nanotechnology, biotechnology, and Information Communication and technology systems, the Fourth Industrial Revolution will massively end, irreversibly altering the way that things are done, including in the SMMEs sector. Using the United Nations' Sustainable Development Goals numbers 8 and 9 and South Africa's National Development Plan as the guiding framework and legislation within which the Fourth Industrial Revolution will unfold in South Africa, this study, set out to carry out an exploitative case study of the fate of SMMEs by focusing mostly on automation and the fate of skilled and unskilled jobs.

This study seeks to understand the experiences and perceptions of people working in SMMEs on the effects of automation on employment through their work experience in an SMME. It also seeks to determine the extent of the utilization, or lack thereof, of automation in the SMME sector. Other aims include an examination of the contingency plans to be put in place to prevent or minimise job losses. Overall, the study aims to identify whether the Fourth Industrial Revolution is having a negative or positive effect on employment in SMMEs. The methodology used was a mixture of literature review and key informant interviews conducted by business owners and workers in Small, Medium, and Micro Enterprises and also by experts in this sector.

The main findings of this study were that without the prerequisite infrastructural development and the necessary digital literacy, South Africa's SMMEs will lose more jobs as a result of technological innovation and automation. This predicament will be exacerbated by the lack of reskilling and upskilling programmes meant to absorb those whose jobs would have been lost to automation. The conclusion reached was that the Fourth Industrial Revolution will not be useful in reducing unemployment, poverty, and inequality. On the contrary, it will widen these gaps and result in more unemployment and unemployability. Instead of being a beneficiary of the Fourth Industrial Revolution, the SMME sector will be one of the most affected sectors of the economy.

Keywords: Fourth industrial revolution, Industry 4.0, technology innovations, skills development, Small, Medium and Micro Enterprises, BRICS

Declaration

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
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4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
BRICS	Brazil, Russia, India, China, and South Africa
GDP	Gross Domestic Product
ICT	Information Communication Technology
IMB	International Business Machines
IoT	Internet of things
FIFA	International Federation of Association Football (The)
NDP	South African National Development Plan
NQF	National Education Framework (The)
OECD	Organization for Economic Cooperation and Development (The)
POPIA	Protection of Personal Information Act 4 of 2013
PPP	Purchasing Power Parity
PwC	PricewaterhouseCoopers
R&D	Research and Development
SAB	South African Brewery
SDGs	Sustainable Development Goals
SEDA	Small Enterprise Development Agency
SMMEs	Small, Medium, and Micro Enterprises
USA	United States of America
WB	World Bank

CHAPTER ONE: INTRODUCING THE STUDY AND THE FOURTH INDUSTRIAL REVOLUTION

1.1 Background

The world has undergone three processes of industrialisation that have been termed "industrial revolutions." We are currently undergoing the fourth process of industrialisation termed the Fourth Industrial Revolution. What qualifies these four processes as industrial revolutions is their impact on life and work, which they fundamentally alter. The Fourth Industrial Revolution is characterised by immeasurable quantum technological developments that explode exponentially, giving rise to multiple possibilities and outcomes never imagined before. The Fourth Industrial Revolution, by definition, is the result of the emergence of many spheres of life, giving rise to products and services such as the Internet of Things (IoT) and big data. Benyera defines the Fourth Industrial Revolution; thus,

> The 4IR is essentially a services revolution brought about by the merging of nanotechnology, biotechnology, information communication technology (ICT), among others in the process blurring the traditional boundaries between the physical, the digital, and the biological worlds, (Benyera, 2022: x).

The magnitude, depth, speed, and effect of the Fourth Industrial Revolution permeates all facets of life. This dissertation aims to investigate the implications of the Fourth Industrial Revolution on employment in South African Small, Medium, and Micro Enterprises (SMMEs).

The Fourth Industrial Revolution has emerged as a transformative phenomenon on a worldwide scale, with governments and multilateral organisations scrambling to capitalise on its opportunities while limiting its possible negative socio-economic effects. As with the three preceding industrial revolutions, the Fourth Industrial Revolution is considered a revolution due to the introduction of new technologies that have fundamentally altered socio-economic structures worldwide. It has replaced the previous order of life with a new one (Prisecaru, 2016).

The Fourth Industrial Revolution involves the simultaneous emergence of several technologies, such as nanotechnology, renewable energy, and quantum computing, in the physical, digital, and biological realms (Schwab, 2017). The technical advances that accompany the Fourth Industrial

Revolution are anticipated to disrupt industries mostly because of the vastly increased automation made possible by artificial intelligence. The Fourth Industrial Revolution is predicted to result in job losses and talent shortages.

According to a 2018 Accenture report, 35% of all employment in South Africa is at risk of becoming fully automated by 2025. (Philips, Seedat, van der Westhuizen: 2018). This equates to approximately 5.7 million jobs. Both blue-collar and white-collar jobs are at risk of being automated, according to the study. Jobs with predictable and repetitive duties are most likely to be automated (ibid.). White-collar jobs such as bookkeeping, accounting, and auditing are repetitive and therefore amenable to being learned by a machine (artificial intelligence). Consequently, it is possible that these jobs will be automated. Moreover, blue-collar occupations such as construction, maintenance, and mining are vulnerable to automation as smarter ways are developed to perform tasks that were previously performed manually by humans.

The loss of jobs in South Africa would exacerbate the country's already severe unemployment problem. The unemployment rate is currently 34.4% (Stats SA: 2021). This does not include discouraged job seekers who have given up looking for work, therefore the actual unemployment rate is significantly higher than 34.4%, thus providing evidence of the severe economic realities in South Africa. This has been exacerbated by the COVID-19 epidemic, which has ravaged the world as we know it, culminating in global unemployment and economic deterioration.

It is also concerning that the Fourth Industrial Revolution may exacerbate inequality among local communities and, more broadly, between first- and third-world nations. As a result of the Apartheid rule, government resources were directed to "white areas," while homelands, or "Bantustans," received minimal to no investment in their healthcare systems, education systems, and basic amenities. This has left South Africa with a legacy of inequality, with the World Bank naming South Africa as the most unequal nation (World Bank, 2022). If South Africa does not take advantage of the potential presented by the Fourth Industrial Revolution, it is feared that inequality will worsen. It may cause South Africa to fall behind countries like China and the United States, which have achieved enormous gains and are at the forefront of the Fourth Industrial Revolution. It is the view of Prisecaru (2016) that African states being recolonized as they become dependent on first-world nations for their technology, particularly through the purchase of green energy. If African states fall behind in this aspect, developed nations will have leverage over them.

The Fourth Industrial Revolution is a continuation of the Third Industrial Revolution, which was characterised by digitalisation such as internet-connected handheld gadgets and other digital technologies that have altered the way of life (Marwala, 2020). Access to modern digital tools and even Internet connectivity is tremendously unequal in South Africa, with poor groups being mostly excluded. Furthermore, it is believed that South Africa has failed to innovate technologically since it has not established its own computing brand (ibid.). Consequently, if South Africa lags in the third industrial revolution, there is cause for concern that it will lag behind in the fourth industrial revolution, making the fear of greater inequality and poverty a legitimate one.

Small, medium-sized, and micro-businesses are among the most impacted sectors when a massive industrial revolution occurs. Small, Medium, and Micro Enterprises (SMMEs) are the driving forces of economic development because they account for 90% of enterprises in developing nations and leading economies, contributing to the Gross Domestic Product (GDP), job creation, employment, and tax provision (Murithi, 2017). To achieve increased economic growth, the South African government has selected SMMEs. This was evident in 1996, when the National Small Business Act No. 102 was enacted (National Small Business Act, No. 102 of 1996, 1996: chap. 1). This Act provides government departments with rules for encouraging SMMEs and reacting to their requirements, such as tax exemptions. Since 1996, this provision has been modified to refine and expand upon the objective of encouraging inclusive economic growth and job creation through SMMEs.

According to Ayandibu and Houghton (2017), SMMEs are the leaders in innovative products, delivery models, and overall innovation in the telecommunications industry. SMMEs are more adaptable than their corporate counterparts, implying that they benefit more from the industry. This stimulates competitiveness and increases economic output. This demonstrates the importance of SMMEs to the South African economy and to employment development. Therefore, this study will investigate the consequences of the Fourth Industrial Revolution on SMMEs, as they are the most adaptable and greatest job creators in the economy.

Anecdotal evidence suggests that the Fourth Industrial Revolution will have a multitude of negative effects on SMMEs in South Africa as a developing country. There could be an increase in competitive pressure, a decline in the capacity to attract and keep qualified workers, and an increase in expenses. In addition, the Fourth Industrial Revolution may result in a decrease in R&D

spending by small and medium-sized businesses in South Africa, which could have an influence on the quality of the products and services they provide.

The Fourth Industrial Revolution has had a substantial impact on South African small and medium-sized businesses. This has resulted in a growth in the number of small and medium-sized enterprises as well as innovative and successful businesses. This has contributed to the creation of increased wealth and possibilities for South Africans and improved the standard of living for a huge number of people.

This study will therefore investigate the extent to which automation is occurring in SMMEs and whether this is leading to job losses. It will investigate whether SMMEs have contingency plans to retain staff in the face of the automation of company tasks, such as upskilling programs. Finally, it will investigate if the attributes sought by SMMEs when recruiting new staff have evolved. This will indicate whether the fear regarding the Fourth Industrial Revolution generating job losses and rising inequality is a real threat and to what extent it has occurred in Johannesburg, South Africa's SMMEs. This chapter provides an overview of the research problem, the significance of the study, the primary research questions, and the underlying assumptions, as well as a glossary of words used throughout the study.

1.2 Introduction

The National Development Plan served as the legislative framework within which an assessment of the impact of a monumental change such as the Fourth Industrial Revolution on South Africa's economy and Small and Medium Enterprises (SMMEs) was carried out. This analysis was carried out to determine how the Fourth Industrial Revolution will affect South Africa's economy and SMMEs. The need to enhance the lives of South Africans can be summed up as the overall and overriding goal of the National Development Plan, which can be condensed as "the need to better the lives of South Africans." The use of job creation is identified as one of the techniques that the National Development Plan will employ to improve the lives of South Africans. This is where SMMEs come into the picture. Increased employment will inevitably lead to higher earnings, which will, in turn, have a trickle-down and multiplier effect on people's discretionary incomes, according to the reasoning behind the national development plan. The anticipated rise in productivity will not only lead to higher wages and greater employability; it will also expand the size of the economy and bring about more economic growth. According to this line of reasoning,

when the economy improves, the state will not be required to spend as much money on welfare programmes like social grants because more families and households will be able to support themselves financially (National Planning Commission, 2011).

In addition to using the National Development Plan as a vehicle for boosting economic growth and expanding the quality of life for South Africans, this goal will also be addressed by the plan. Additionally, the state intends to use this strategy to improve the skill sets of people living in South Africa, particularly young people and people working in SMMEs. The National Development Plan also addresses the need to diversify the economy and, therefore, the engagement of previously marginalised people in the economy, SMMEs were recognised as the right vehicle to improve South Africa from a developmental state into a middle-income developing nation. By placing an emphasis on small and medium-sized enterprises (SMMEs), South Africa may take advantage of the many opportunities presented by the Fourth Industrial Revolution and grow into the nation it envisions becoming. However, much like previous eras of industrialization, the Fourth Industrial Revolution does not just usher in new opportunities; it also brings with it new challenges. Because it also brings risks, the presence of the fourth industrial revolution does not automatically translate into a direct benefit for SMMEs. Indeed, anecdotal data has revealed that, on balance, the survival of SMMEs in the Fourth Industrial Revolution is based on their ability to adapt to a fast-changing global economic system.

South Africa's effort to align itself with the United Nations' Social Development Goals (SDGs) for 2030, which aim to increase human development while simultaneously striving towards ecological sustainability, includes the promotion of SMMEs as an additional component of the program. Goals 8 and 9 of the Sustainable Development Goals have been mapped out to correspond with South Africa's developmental plans, which are contained in the National Development Plan. "Decent work and economic growth" is objective 8 of the Sustainable Development Goals, and "industry, innovation, and infrastructure" is goal 9. Specifically, the utilisation of SMMEs to obtain higher productivity, increase the economy, and reduce poverty is associated with goal number eight, which strives to promote sustained, inclusive, and sustainable economic growth.

In an ideal world, the government of South Africa will adjust its goals for economic growth so that they are compatible with the Fourth Industrial Revolution. The use of artificial intelligence results in an improvement in productivity but poses a threat to employment (Marwala, 2020). Considering

this, the government should ideally focus on skills development that artificial intelligence cannot replace and skills where people operate and oversee the usage of artificial intelligence in diverse businesses. This will make it possible for the economy to flourish as a consequence of an increase in productivity brought about by artificial intelligence, and it will also make it possible to mitigate the possibility of job losses through the training of relevant skills. In terms of the ownership of production being held by a diverse group of people, the opportunity for black South Africans, and particularly for black-owned SMMEs, to have their participation in the prospects presented by the Fourth Industrial Revolution stated in legislation.

It seems unlikely that we will have achieved anything near full employment by the year 2030; nevertheless, if we improve our educational system and the percentage of people who have completed high school, this will lead to increased employment and wages. However, in addition to the enhancement of education, an intense plan to expand the economy to absorb graduates is essential. According to the Quarterly Labour Force Survey, the graduate unemployment rate reached 11% in the second quarter of 2020, (Stats SA: 2021). Thus, it is null and invalid to increase education only for graduates to have little to no career options. Literacy rates within the education system have been shown to be exceptionally low, with science and technology having even lower rates. This is especially the case within black communities, as science and technology were previously taught at schools that were exclusive to white students during the apartheid era (Saahier, 2017). This resulted in a legacy of inadequate education in subject areas that are essential for the development of talents such as computing, block-chain technology, and other advantageous abilities necessary for the Fourth Industrial Revolution.

According to its gross domestic product (GDP), South Africa's economy dropped from being the best performing economy on the African continent in 2005 to the third best performing economy in 2020, (Zandt, 2021). Nigeria's and Egypt's economies have risen to become two of the three leading economies in Africa (ibid.). The exportation of petroleum and the expansion of Nigeria's banking sector, in addition to the rapid growth of its technology hub, have all contributed to Nigeria's rise to the position of having the most robust economy in all of Africa. Kenya has embraced sectors associated with the Fourth Industrial Revolution by becoming the home of technology powerhouses such as Google, International Business Machines (IMB), and Cisco, therefore also seeing a jump into the top 10 economies in Africa (Chakravorti & Chaturvedi, 2019). (Chakravorti & Chaturvedi, 2019). Thus, showing the advent of the Fourth Industrial Revolution,

associated industries contribute to a state’s economic development in African states. This pattern can be observed in economies all around the world, and further discussion on this topic will be found in chapter two.

The link between SDG goals number 8 and 9 and South Africa's National Development Plan is that both seek to address South Africa's a longstanding triple challenge of unemployment, inequality and poverty. The logic is that with more sustainable jobs being created as a result of the Fourth Industrial Revolution inequality, unemployment and unemployability will be reduced, and eventually poverty will also be reduced, resulting in a better quality of life. The origin of this argument is the realisation that the creation of sustainable jobs is efficacious in attaining social development, reducing poverty and inequality, and eventually leading to a more developed state as a result of the availability of disposable income, among others. The SDG goals #8 and nine and the National development plan are therefore in alignment with each other and can be used to guide how SA SM is interact with the fourth Industrial Revolution.

The biggest challenge with this approach is not a new one and is one which was experienced with the previous round of the United Nations Millennium Development Goals. No matter how well-meaning both the Social Development Goals and the National Development Plan are, the crux of the matter is on how they will be implemented. Hence the relevancy of this study which seeks to evaluate and assess the impact to which automation his head on the SMEs industries in South Africa.

To foster economic expansion and progress, it is essential for South Africa to emulate the practise of investing in the Fourth Industrial Revolution and other industries that are closely tied to it, since South Africa’s economy is at risk of further sliding down the list of top performing economies on the continent. The effects of the Fourth Industrial Revolution on small and medium-sized enterprises (SMMEs) are extremely important to comprehend because of the significant role that SMMEs play in the economy, particularly in terms of their contributions to the Gross Domestic Product (GDP), job creation, employment, and tax provision, as well as their adaptability and innovation.

As a result, it is necessary to understand the effects of the Fourth Industrial Revolution to accomplish the goals set forth by the National Development Plan for 2030, which are to achieve economic development and nearly full employment by the year 2030. Considering the potential

threats, it has to employment. It is crucial to investigate the effect that the Fourth Industrial Revolution has had on employment conditions inside SMMEs, given the significance that SMMEs play in the creation of jobs and the contribution that these jobs make to the GDP.

1.3 Problem statement

In South Africa, it is anticipated that SMMEs will profit immediately from the Fourth Industrial Revolution. Given that the Fourth Industrial Revolution is a revolution in services and technology and that the majority of SMMEs are driven by unskilled and semi-skilled workers, the advent of the Fourth Industrial Revolution will surely bring more benefits than drawbacks to this sector. The problem is that the previous three industrial revolutions have resulted in more negatives than positives, in Africa in general and South Africa in particular; hence, the need for this study to examine the perceived benefits of the Fourth Industrial Revolution's automation to South Africa's SMMEs.

1.4 Rationale and Significance of the Study

The rationale for this study was to investigate how SMMEs may benefit from the Fourth Industrial Revolution. Employers and employees in the SMME sector will have the chance to share their experiences with this study regarding the impacts automation and the Fourth Industrial Revolution have had on their SMMEs and their industry. There is a wealth of knowledge regarding the Fourth Industrial Revolution and how it affects employment. However, little is known about its consequences, notably for SMMEs, a key factor in the economy.

The survey will also indicate whether automation has led to employment losses and whether it has altered hiring standards in SMMEs. This will show whether the Fourth Industrial Revolution-related anxieties are justified. The Fourth Industrial Revolution is an emerging phenomenon, and policymakers and the government will need to adjust quickly. Additionally, it employs a proactive social development perspective with the intention of offering suggestions for ways to lower unemployment in South Africa to achieve the objectives outlined in the NDP and SDG 2030. It will reveal areas that require action.

Employers will also benefit from it because it will enlighten them about the changing nature of the workplace and how they can help to lessen its negative impacts. It will benefit the entire public because it will educate students about new job opportunities as well as those that are rapidly becoming obsolete. Job seekers will learn about the shifting standards that businesses use.

1.5 Aims of the Study

The aim of this study is to investigate SMME employees' perceptions of the effects of automation on employment based on their work experience in SMMEs. Therefore, the Fourth Industrial Revolution is thus a societal reality that this work seeks to define and comprehend.

1.6 Main Research Questions

- Has the SMMEs automated any of their functions?
- Has automation if any, lead to job losses?
- Did SMMEs plan to upskill its employees to curb human irrelevance?
- What skills and employability characteristics did the SMME look for from job seekers?
- Has this changed over the last 5 years?

1.7 Research Objectives

- To determine if automation is being utilised by SMMEs.
- To examine if automation is leading to job losses.
- To identify whether the Fourth Industrial Revolution is having a negative or positive effect on in employment in SMMEs.

1.8 Main Assumptions

- SMMEs have automated some functions to a low extent, and to a higher extent increased in digitalisation.
- Automation has led to some job losses of blue-collar jobs but to a relatively low extent due to the slow progress of automation in SMMEs in South Africa
- Employers will not have plans of upskilling staff to prevent job losses.
- SMMEs will now look for skills that surpass the use of Microsoft Office Suite but require job seekers to have knowledge in higher grade use of technology such as coding.

1.9 Clarification of Terms

The following section defines the terms used in this study. This clarification is important because it puts the reader on the same conceptual level as the writer and helps contextualize disputed terms and terminologies.

1.9.1 Fourth Industrial Revolution

Popkova, Regulina, and Bogoviz (2019) define an industrial revolution as the accumulation of new technology on such a large scale that it alters production and the economy. A revolution suggests that evolution occurs in a manner distinct from earlier manufacturing processes, hence radically altering and accelerating industries. The Fourth Industrial Revolution is the emergence of technologies such as robotics, the Internet of Things, cloud computing, 3D printing, machine learning, and artificial intelligence in particular (Prisecaru, 2016). The Fourth Industrial Revolution is also known as Industry 4.0 and the Fourth Industrial Revolution.

1.9.2 Automation

Automation refers to the process of machines undertaking work that humans would typically accomplish (Ford, 2015). Artificial intelligence and machine learning accomplish this. Others may refer to automation as the use of technical tools and processes to lessen the amount of human interaction necessary to perform a task.

1.9.3 Artificial Intelligence

The merger of computer science and human intelligence used to solve issues and simplify systems is called artificial intelligence (AI), (Borana, 2016). It is a branch of computer science concerned with the creation of aware, intelligent machines. It is designed to mimic human behaviour and execute human jobs with speed and precision. When coding, data gathering, and algorithms are used to implement artificial intelligence, computers can learn without being explicitly instructed. AI research focuses primarily on creating machines that can match or surpass human intelligence, but in a less cognitively demanding setting.

1.9.4 Employability

Employability is the measure of a person's desirability as a future employee by his or her own company or another organization. Employability is also the ability to meet an employer's requirements. It focuses on the individual and their possession of attributes that suit the needs of companies, allowing them to acquire employment (Römgens, Scoupe, & Beauvaert, 2020). The talents, knowledge, technological proficiency, and adaptability of an individual are desirable for obtaining a job. This determines whether a person is employable or unemployable and, to a certain extent, their capacity to move across roles.

1.9.5 Human irrelevance

Human beings have been critical to the process of production through human labour. With the advancement of technology, such as self-driving cars, self-service check-out tills, automated factories, and warehouses, much of the manufacturing process requires less human labour. Brynjolfsson and McAfee (2015) compare the exponential growth in computing and robotics that is replacing human labour to how early innovations like tractors and automobiles replaced horses. Thus, human irrelevance refers to a decrease in the need for humans in the production process, rendering humans obsolete. This is not only important in blue-collar jobs where people work on farms, in construction, or in jobs that require physical or manual labour. It is also relevant to white collar or "office" jobs, as automated machines are now being used across industries.

1.9.6 Black people

According to South Africa's Broad-Based Black Economic Empowerment (B-BBEE or BEE) Act 53 of 2003:

…a Black person' is a generic term which means Africans, Coloureds and Indians. It refers to those who are citizens of the Republic of South Africa by birth or descent; or who became citizens of the Republic of South Africa by naturalization before 27 April 1994; or on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date.

People in South Africa generally consider black people to be either South African natives or individuals with at least some African ancestry. This includes people who were born and raised in South Africa, as well as those who have visited or currently live there.

1.9.7 Small Medium and Micro Enterprises (SMMEs)

SMMEs are businesses that have fewer than 250 employees. Small enterprises have a staff of 50 employees or less. Medium enterprises have a staff compromise of above 50 employees but less than 250 employees. Businesses with an annual revenue of less than R10 million are also considered SMMEs (Ayandibu, Houghton: 2017). Small Medium and Micro-Enterprises are businesses with a turnover of up to R3 million, and a customer base

of less than 500 families. A micro-enterprise is classified as a small business if its sales are less than R10,000 a year.

1.10 Summary

This chapter has introduced the planned research study's title, as well as its underlying context and justification for conducting the investigation. An overview has been provided of the study's research topics, aims, and underlying assumptions. There is a definition provided for each of the key terms that are used throughout the study. In the following chapter, a review of the relevant previous research will be presented to support the aims of the study. It will present the theoretical framework that the study is governed by, as well as the policies and laws that are now in place regarding the Fourth Industrial Revolution.

CHAPTER TWO: EXPLORING AND HISTORIZING THE FOUR INDUSTRIAL REVOLUTIONS: A LITERATURE REVIEW

2.1 Introduction

The objective of this chapter is to provide the reader and the researcher with a more comprehensive grasp of the significant subjects by doing an analysis of the existing research on the research challenge presented in the previous chapter (De Vos et al., 2011). This chapter delves into the investigation of the key focuses of the study, which are as follows: (1) the Fourth Industrial Revolution and automation; (2) employability; and (3) SMMEs in South Africa. It discusses the laws that are currently in effect as well as the theoretical underpinnings of the research. However, before beginning the review of the relevant literature, it is required to first carry out some preparatory research. I would like to describe how I came to explore the literature that I studied as well as how I perceive the role that a literature review plays in an investigation of this kind. A simple overview of the types of books that are available, along with who authored what, when, and how, does not constitute a literature review. An activity that drives the relevance of one's present study is exploring the existing literature, classifying it, and exposing the inadequacies of the material that has been discovered so far.

The candidate is able to demonstrate their familiarity with the scholarship and the areas in which further research on the subject will be undertaken with the assistance of the literature review. Additionally, it assists students in demonstrating formal comprehension. The candidate is given the opportunity to demonstrate their intellectual independence through the process of writing a literature review. This allows the candidate to discuss how the literature can be categorised and organised into analytic categories. My literature evaluation, which takes the shape of this dissertation, is structured as a critical discussion that is framed by a historicisation of the last three industrial revolutions and how those revolutions have consistently influenced SMMEs. In addition, I conducted a literature review to highlight the depth of my comprehension of the numerous debates, theories, and methodologies about the impact of the Fourth Industrial Revolution on small and SMMEs in South Africa.

2.2 Industrial Revolutions and Automation

A process of automation and the gradual replacement of humans by machines is what happens as a direct consequence of an industrial revolution. Automation is a fundamental component of each successful industrial revolution. As a result, anytime there is an industrial revolution, there is always fear among humans, notably the government and labour groups, about the potential loss of employment due to automation. This is because automation tends to replace people in labour-intensive jobs.

In most cases, the history of automation can be traced back to the commencement of the industrial revolution. On the other hand, there isn't much agreement over when exactly the industrial revolution started. Between the years 1750 and 1847, a period that is usually referred to as the First Industrial Revolution, took place in Great Britain. Other civilizations, such as the Chinese and numerous African ones, saw a much greater number of industrial revolutions than did the Western world. Since the time of the Kush civilisation, which flourished between around 1050 BCE and 350 CE in what is now desert-written Egypt, the country has had the ability to harness water from the Nile River, the only river that flows through their area, and use it to feed an entire community.

The history of the industrial revolutions is helpful in improving one's grasp of the Fourth Industrial Revolution. This is because each revolution builds upon the one that came before it, and there are observable recurring elements across each revolution. According to Rifkin (2011), the beginning of each of the revolutions coincided with the development of a new communication technology that made it possible to organise economic activity in a more effective manner. Concurrently, a new energy source that propels economic activity is made available to the public. And last, new modes of transportation are developed to facilitate the flow of economic activity more effectively. In the end, this results in alterations to the environment, as smaller groups of people coalesce into larger ones and governing structures are reorganised (Rifkin, 2011). An analysis of how each of these characteristics of industrial revolutions played out in each revolution is presented in the next section.

The fact that robots are now taking over jobs that were traditionally carried out by humans is not a particularly unusual development that is taking place during the Fourth Industrial Revolution. This advancement may be traced back to the very first industrial revolution, which occurred during a time when machines produced at a faster rate than people. Robots do not get sick, do not take

smoking breaks, and cannot be away from work without authorisation (AWOL) like their human counterparts, which was the justification for the complete acceptance of machines over people. The temptation among industrialists to replace humans with robots was immense.

The replacement of people with machines was a tendency that persisted through the second and Third Industrial Revolutions and is presently becoming more consolidated in the fourth industrial revolution. The First Industrial Revolution was the starting point for this trend. As a result, what is taking place at this time of the Fourth Industrial Revolution is not a brand-new phenomenon. What we are seeing is really the continuation of a pattern that was established during the early stages of the First Industrial Revolution.

2.2.1 The First Industrial Revolution

An industrial revolution results in a process of automation and the replacement of humans by machines. Automation is a vital part of an industrial revolution. As a result, anytime there is an industrial revolution, there is always fear among humans, notably the government and labour groups, over the impending loss of jobs due to automation.

Historically, automation dates to the commencement of the industrial revolution. However, there is no consensus on the start of the industrial revolution. The period from 1750 to 1847 that is often referred to as the First Industrial Revolution occurred in Great Britain. However, many more industrial revolutions occurred in other civilizations, such as China and Africa. Since the age of the Kush civilisation, which lasted from around 1050 BCE to 350 CE, Egypt has been able to utilise water from the Nile River, the only river that flows through their region, to sustain an entire population.

Understanding the history of industrial revolutions facilitates knowledge of the Fourth Industrial Revolution, as each revolution builds upon the preceding one and themes become visible as they progress. According to Rifkin (2011), each revolution began with a new communication technology that made it possible to organise economic activity more efficiently. Concurrently, a new energy source that propels economic activity is introduced. And last, new modes of transportation are developed to effectively move economic activity. In the end, this influences the environment, as people combine into larger groupings and governance changes (Rifkin, 2011).

The subsequent section examines how each of these characteristics of industrial revolutions materialised in each revolution.

As robots replace people in formerly human-performed vocations, the Fourth Industrial Revolution is not a unique event. This advancement may be traced back to the first industrial revolution, during which machines were more productive than humans. The absolute acceptance of machines over people was justified by the fact that robots do not get sick, do not smoke, and cannot be absent without authorization (AWOL) like humans. The industrialists' desire to replace humans with robots was intense.

The first industrial revolution represented the beginning of people being replaced by machines, a trend that persisted through the second and third industrial revolutions and is presently solidifying in the fourth industrial revolution. Therefore, what is transpiring during the Fourth Industrial Revolution is not a new occurrence. Rather, it represents the continuation of a pattern that began with the First Industrial Revolution.

2.2.2 The Second Industrial Revolution

The Second Industrial Revolution took place in the mid-1800s. Its epicentre was the United States of America and was most effective from roughly 1860 to 1914 (Mohajan, 2019b). This revolution is distinguished by the invention of the electric motor, or "electromagnetism", which resulted in improved production using electricity. Electronic communication devices such as the telegraph, telephone, and radio were developed (ibid.). Electricity was mostly fueled by inexpensive oil, with coal and steam engines being phased out. This technical advancement disrupted manufacturing by dramatically increasing the pace and scale at which items were created; this is what we refer to as the rise in mass production.

The Ford Motor Company, which invented the assembly line that resulted in the first mass manufacturing of automobiles, was a perfect example of mass production at the time. This marked a departure from steam trains and ships as the primary forms of transportation. And economic activity was now conveyed by automobiles, buses, and trucks, which were made more accessible by the Ford Motor Company. In the period of mass production and capitalism, productivity was thought to be dependent on superior technology and labor. As working circumstances changed, this had an impact on employment. As capitalists were propelled by the frenzy of mass production

and profit, workers were expected to work harder and for longer hours. People began working 16-hour workdays while living below the poverty line, according to Nichols and Unger (2017).

South Africa, on the other hand, was trapped in the mineral energy complex that afflicted the whole continent. Private mining firms were the primary users of power and modern transportation systems (Marwala, 2020). Furthermore, because South Africa was largely racially divided and black people were merely utilised as cheap labour, the technical advancements of the period had not infiltrated into these areas as a purposeful strategy of infantilisation.

2.2.3 The Third Industrial Revolution

The Third Industrial Revolution, sometimes known as the "digital" revolution, began in the 1940s and was sparked by the creation of the semi-conductor and, later, the transmitter in 1947. (Marwala, 2020). This resulted in an increase in electronic appliances and a move from analogue to digital technology (ibid.). As an example, consider the transition from television antennae to digital means like the internet and streaming.

In contrast to the first two industrial revolutions, which helped and developed Europe and the United States, the third industrial revolution has benefited countries worldwide. This is due to the increased efficiency of green energy, transportation, lean manufacturing, advanced manufacturing technologies, the internet of things, information technology (IT), and 3D printing, which are widely available throughout the world (Mohajan, 2021). This improves production in the education, health, defence, finance, and administrative sectors. This is evident in the rise in GDP per capita in both developed and developing countries (Connors, Gwartney, & Montesinos, 2020).

The third industrial revolution has been revolutionary in the sense that it has turned the old capitalist global economy into a sharing economy. With the emergence of industries with little to no marginal costs, such as having a YouTube channel and generating cash from brand endorsements, the ways of earning a living have expanded, and the need for capitalist bureaucracy to employ people has essentially altered (Rifkin, 2011). This may also be observed in the usage of e-commerce platforms like UberEATS delivery service, which allows restaurants and small cooks selling take-away meals to reach a bigger client base without relying on renting space. This type of innovation has transformed entrepreneurship, offering underdogs a piece of the retail income

pie. Similar systems, such as Uber and Airbnb, enable people to earn money by profitably sharing their car or house.

As a result, employment and money creation opportunities have increased. However, unpleasant and risky working conditions are increasingly being reported across industries, and workplace machines have resulted in fatalities (Mohajan, 2021). Over 6,500 immigrant workers have perished in the construction of new stadiums, giant buildings, highways, and a whole new city in Qatar's preparations for the 2022 FIFA World Cup (Mail & Guardian, 2021). This proves how, as corporations strive towards enhanced manufacturing, job expectations have gotten tougher and more harmful to human lives. Similarly, to the second revolution, when capitalists were bent on mass production and boosting profit margins even at the sacrifice of workers' rights and wellbeing, we witness the same strong purpose in the fourth revolution, but to accomplish and maximise innovation.

Furthermore, the third industrial revolution has expanded the global carbon footprint as a result of large-scale manufacturing and mass consumption, which is hastening climate change (Mohajan, 2021). This has a significant influence on food production, and in Africa, where food security is already precarious and governments have few resources, the repercussions of climate change are harsh. Water scarcity has risen in Africa, and government rules prohibiting land ownership, particularly in Southern Africa, have a significant impact on food security and deepen the inequality gap (ibid.).

However, because of South Africa's massive inequality gap, access to these technologies is not evenly dispersed among low-income populations and rural areas. This was obvious during the COVID-19 epidemic, when the government imposed strict geographical quarantining, often known as "lockdown," to prevent the virus from spreading. As a result, academic institutions were shuttered, and non-essential personnel were prohibited from physically reporting to their workplace. This meant that education and employment had to be done from a distance. To do this, each person working or attending school needed a computer or laptop as well as internet access. According to Stats SA (2016), just 9.5% of the population has a home internet connection, with most of those figures concentrated in Gauteng and Cape Town. In South Africa, the cost of data also limits access to the internet.

2.2.4 The Fourth Industrial Revolution

The Fourth Industrial Revolution is a technology driven services revolution which was aided by the coming together of many aspects of life, but predominantly through the amalgamation of nanotechnology, information technology, and communication and biotechnology, thereby blaring the boundaries between the sentient end the insentient through the creation of the Internet of Things. The production of industrial goods has transitioned to the use of contemporary digital machines that are connected to one another and are able to respond to changing conditions in real time by coding that enables machine learning and, eventually, culminates in the automation of machines (Sukhodolov, 2019). This indicates that the production process as well as distribution are handled by "intelligent" equipment. As a result, there is less of a demand for human labour during the manufacturing process. This reduces the potential for human error, which in turn lowers associated costs and results in production that is more accurately copied. A wide variety of devices are networked with one another and can teach themselves thanks to their connectivity to the internet. For instance, more machines are now wi-fi compatible; as a result, the software on these computers can now self-update and save information such as the patterns of how the machine is used; these patterns may then be replicated.

Transportation has also been modernised thanks to intelligent machines, which have enhanced safety capacities and even led to the development of self-driving cars (ibid.). As a result of this advancement in transportation and logistics systems, the quantity of distribution has drastically improved. The rise in production and distribution provides a boost to the economy, and the introduction of innovative products raises the general level of well-being among the populace.

The unintended consequence of this, however, is the elimination of jobs, since activities that were formerly carried out by humans are gradually being replaced by machines. The need for 'intellectual labour' has increased in tandem with the decline in the necessity for human labour. Even though machines are "smart," they still need to be maintained, which means that workers need knowledge and skills in communication technologies as well as the ability to use evolving information (Spendla et al., 2017). This suggests the introduction of new characteristics that are required of employees to get employment. This is true not only for job opportunities in settings where commodities are produced but also in settings where services are supplied, because both settings are becoming increasingly automated.

The shift away from human labour towards work that needs intellectual or specialised skills will have an impact on the education system since lesson plans in schools will need to account for artificial intelligence. Marwala (2020) recommends that school curricula become more interdisciplinary, with students learning both social science and technological subjects. This is since knowledge and capabilities in communication technologies are becoming more widespread, while at the same time, students should learn social science subjects because understanding society will continue to be important because machines are unable to carry out jobs that require a human touch, such as psychology. This presents a particularly difficult problem in South Africa, where the school system already struggles with problems like inequality, high dropout rates, and ineffective government funding. This problem is widespread throughout the world's emerging nations.

This transition to production being based on knowledge capital, or to rephrase it, the transition to a knowledge economy, requires employers to upskill employees, which is highly dependent on an employer's knowledge and attitude towards innovation. In other words, the knowledge economy transition requires employers to upskill employees, fuelling the fear of the loss of millions of jobs due to a lack of technical skills. The culmination of all these concerns is the anxiety that widespread job losses would lead to increased rates of economic inequality and poverty. As a result, the self-learning or otherwise "smart" digital technologies that automate manufacturing processes are going to be the distinguishing feature of the Fourth Industrial Revolution. This is helpful to the economy since production will increase as products are produced more efficiently and with less human participation. This will result in fewer jobs being created. The result of the production and availability of higher-quality goods will be an improved quality of life for the general population. On the other hand, this will have the unintended consequence of causing widespread unemployment as machines gradually replace human labour. To find a solution to this problem, changes need to be made to the educational system so that humans can be trained to work with machines. This must take place in the educational system as well as via the upskilling of employees to prevent a talent shortage as we transition from an economy based on human labour to one based on information. Many people are concerned that the Fourth Industrial Revolution will lead to a significant decrease in employment opportunities as well as a rise in both inequality and poverty.

2.3 The four industrial revolutions and SMMEs

The overall loss (human, material, epistemic, and dignity) that Africa endured is one that stands out as a consistent theme throughout all four waves of industrialization. However, when it comes to SMMEs in Africa and South Africa, the relationship with the four industrial revolutions was in some ways balanced, as SMMEs tended to lose and gain. This was the case because SMMEs had a balanced relationship with each of the revolutions. For instance, because of the development of engines, they increased their level of effectiveness, but at the same time, human beings lost their employment and their means of subsistence.

This research will provide a concise overview of Africa's role in each of the previous three industrial revolutions as a means of analysing and contextualising the ongoing Fourth Industrial Revolution as well as investigating and historicizing the previous three industrial revolutions. When people in the Global North, particularly the United Kingdom, witnessed the invention of many technologies that resulted in mass production, Africa witnessed the inverse in the form of slave trade to provide free labour to these industrialising nations. This was done in order to meet the demand for cheap labour. During the same time as the global north was undergoing the Second Industrial Revolution, Africa was undergoing colonialism, conquest, cruelty, and genocide. The global north needed to satiate its enormous demand for raw materials and markets, and it regarded Africa and the global south as the ideal targets for this cruelty since they had the most limited resources available. As a result, the Second Industrial Revolution is not celebrated in Africa; rather, it is lamented as a phenomenon that ushered in the catastrophe of colonization. In a similar vein, the Third Industrial Revolution should not be welcomed from an African point of view since it brought about imperialism. If we follow this logic and trajectory, we can reach the conclusion that the Fourth Industrial Revolution will consolidate imperialism, or what some people call coloniality. Coloniality refers to the continuation of unequal power relations between former colonies and their former colonizers, even in the absence of official colonialism and apartheid. The consolidation of imperialism will occur because of the Fourth Industrial Revolution.

What is necessary is to determine whether the rate of automation is being matched with the rate at which individuals who lose their employment because of automation and the industrial revolution are being matched. This is what is meant by the term "imperative." The rate at which procedures of reskilling and upskilling labour that would have been rendered unnecessary because of the

innovations that came about because of the industrial revolutions are occurring is not happening at the same speed as the rate at which technical innovation is occurring. As a direct consequence of this, many individuals have lost their employment and their means of subsistence. The most significant effect of this is what we now refer to as a widespread lack of digital literacy. The Fourth Industrial Revolution will be driven mostly by advances in information and communications technology (ICT), and to profit from and actively participate in the Fourth Industrial Revolution. They require a high level of digital literacy. Most of the jobs that are being eliminated because of this trend in the SME sector are manual occupations that were formerly carried out by semi-skilled or unskilled laborers. Brick moulding is an example of a job like this that exists in the informal sector. The effort of retraining and improving the skills of an informal brickmaker is a herculean one, if not an impossible one.

2.4 South Africa, BRICS, and the Fourth Industrial Revolution

Without comparing this study to other nations that are experiencing comparable problems and circumstances, it would be incomplete. Searching for such nations can be aided by looking at groups of nations that have similar ideologies, such as those that are geographically or economically grouped. The BRICS (Brazil, Russia, India, China, and South Africa) alliance includes South Africa. It also takes part in the Southern African Development Community (SADC) and the South African Customs Union (SACU), which is a monetary union based on the Rand be aided by looking at groups of nations that have similar ideologies, such as those that are geographically or economically grouped. The BRICS (Brazil, Russia, India, China, and South Africa) alliance includes South Africa. It also participates in the Southern African Development Community (SADC) and the South African Customs Union (SACU), which is a monetary union based on the Rand. Of these three, BRICS provides a more useful comparison since South Africa will be compared with nations that are at a comparable developmental stage.

Different nations are adopting the Fourth Industrial Revolution at different phases. Leading developing market economies from around the world have merged to form BRICS. These emerging nations were grouped together because they have a substantial informal economy, a fast-growing GDP, and contemporary industrial sectors (Armijo, 2007). South Africa joined the BRICS in 2010, but initially, it was simply a term used by economists. In 2009, BRICS formalised their unity. The union wants to work together on common aims and trade deals. Based on its unified

structure and shared objectives, the Fourth Industrial Revolution's trajectory and strategy in different nations are so comparable.

The Automation Readiness Index (2018) places China as the world's 12th most automated country, followed by Russia (16), India (18), Brazil (19), and South Africa (22). The BRICS nations exhibit comparable Fourth Industrial Revolution places and trajectories. China is poised to surpass all other BRICS nations to become one of the first artificial intelligence (AI) superpowers. The "Next Generation Artificial Intelligence Development Plan," released by the Chinese government in 2017, was the first step in laying out its strategy for using the Fourth Industrial Revolution and AI. In it, China outlines the legal frameworks, social governance, international competition, and economic growth necessary for China to become the world leader in AI by 2030. (Roberts et al., 2021). The Ministry of Science and Technology and the AI Plan Promotion Office oversee organising this. The administration intends to put this into action by offering the business sector and local government significant incentives. The government supports private businesses and "national champions" in achieving the plan's stated strategic objectives. National champions have first dibs on contracts, early access to fining, and occasionally market share protection (Graceffo, 2017). Consequently, as a wish list with incentives, the "New Generation Artificial Intelligence Development Plan" (Sheehan, 2018)

The political structure in China, which permits government goals to trump civil liberties and public involvement, also contributes to the country's rapid AI development. This is demonstrated by the Social Credit System, which tracks citizen behaviour from littering to late debt payments and assigns points to each action (Roberts et al., 2021). The use of AI in China to restore morality and promote productive citizenship raises ethical and privacy concerns. There are numerous examples of how China uses AI to address government problems.

Employment has not been significantly threatened despite China rapidly automating daily life, let alone production, according to a PwC report titled "Sizing the Prize: What's the Real Value of AI for Your Business and How Can You Capitalize?" This is because labour is needed to install and maintain automated machines, as well as China's education reform, which supports the skilled labour needed for AI and the Fourth Industrial Revolution (Roberts et al., 2021). As a result, China has been able to employ AI to address state problems while reducing the likelihood of widespread job losses because of automation, thanks to its approach to the Fourth Industrial Revolution and

its steadfast desire to become a world leader in AI. China is the global leader in innovation, artificial intelligence (AI), and the Fourth Industrial Revolution.

2.5 The Fourth Industrial Revolution and Social Development in South Africa

The Fourth Industrial Revolution has been viewed in South Africa as a panacea to the challenges that are faced in the tertiary education, agriculture, security and other services industries, but rarely as part of the solutions to the social problems. The fourth industrial revolution, like its three predecessors, is viewed as a significant disruption to social life and economic activities in South Africa. This industrial revolution is viewed more as a disruptor than part of the solutions to the country's social and developmental challenges.

As a highly unequal society comprising the haves and the have-nots, the digitised and the digi-deprived, South Africa experiences the Fourth Industrial Revolution in exactly that same bifurcated manner. The digitised will quickly embrace and ride on the benefits of Fourth Industrial Revolution, while the digi-deprived will sink lower into the realms of marginalisation and greater inequality as they will not be able to participate in a digital economy. Stated differently, those with existing digital footprints prior to the onset of the Fourth Industrial Revolution will benefit more than those who did not have a digital footprint. Therefore, one of the new social challenges that will be created by the 4th Industrial Revolution is the entrenchment of poverty and the feather white, or widening of the gap between the deprived and the digitised. Resultingly, those without a digital footprint will not be visible in the economy, and this involves the majority of South Africa's as SMMEs that have hitherto operated as informal entities.

In the Fourth Industrial Revolution, the notion and interpretation of literacy has taken a new meaning. Literacy no longer means the ability to read and write. It now means the ability to adapt to a fast-changing technological environment. The impact of the Fourth Industrial Revolution on South Africa's SMMEs in inherent in the literacy of those that participate in this economy. Together with the government's ability to turn its plans into action, literacy will play a huge role on how South Africa is impacted by the Fourth Industrial Revolution generally. The next section discusses South Africa's approach in the Fourth Industrial Revolution.

2.6 South Africa's approach to the Fourth Industrial Revolution

The reaction of South Africa to the Fourth Industrial Revolution is comparable to that of the other BRICS countries in that it places an emphasis on the development of artificial intelligence, unemployment, and appropriate training. On the other hand, since they share comparable resources and socioeconomic standing, it is most analogous to Brazil and India. In the 2019 State of the Nation Address, when President Cyril Ramaphosa declared that the government will focus its efforts on artificial intelligence, the initial step that the government took to commit to the Fourth Industrial Revolution was to declare that the government will focus its efforts on AI. In later years, the President established the Presidential Commission on the Fourth Industrial Revolution to assist the state in maximising the potential advantages of the revolution while also mitigating the risks that may arise from it (Marwala, 2020). This is a typical response, as seen in the other BRICS countries; in contrast, South Africa's answer came far later than the others.

Cabinet proposals given by the Presidential Commission on the Fourth Industrial Revolution emphasised the necessity of investing in human capital to avoid a talent shortage caused by the shifting skills that are required in the digital era. In addition to the ideas described in more detail in the sub-chapter called "Policy and Legislation," suggestions were also made about setting up an AI institution, improving industrial techniques, and creating intelligent infrastructure.

The recommendations put out by the Presidential Commission on the Fourth Industrial Revolution are founded on the concept of collaborating with municipal governments and the private sector. To address the challenges that are impacting service delivery, the local government is looking for AI-based solutions. To identify electrical defects in substations and prevent blackouts, an artificial intelligence system has been created in Johannesburg (Marwala, 2020). Finally, improving the performance of local government services and displaying support for the national policies governing the Fourth Industrial Revolution.

Change had already started to take place in the private sector, notably in the manufacturing industry. In the early 2000s, the Ibhayi Brewery in Gqeberha was recognised as the brewery with the highest level of automation in the Southern Hemisphere. The South African Brewery (SAB) addressed this issue by investing 438 million rand in the automation of its breweries to increase both capacity and human operation (Marwala, 2020). South Africa has developed an artificial intelligence system that can help those who have lost their voices regain the ability to talk (ibid.).

The employment of drones in the mining industry, as well as agricultural and logistics operations, has led to a significant boost in production levels at these businesses. South Africa, like India and Brazil, does not have the financial resources necessary to invest in artificial intelligence technologies, and its internet connection is severely lacking.

Because of this, South Africa is the driving force behind the Fourth Industrial Revolution; nevertheless, both the private sector and municipal governments need to join in. Through the implementation of AI solutions to address issues regarding service delivery, local government has proven its preparedness to participate in the national goal of AI. The commercial sector has also provided evidence that it is committed to the achievement of the national goal by serving as a leader in the implementation of AI in the fields of medicine, logistics, agriculture, and mining. Through various education and training initiatives, the government tries to mitigate the impact of potential job losses brought on by technological advancements.

2.7 Policy and legislature

This section examines the policy and regulatory framework within which SMMEs operate and the Fourth Industrial Revolution is taking place.

2.7.1 The Skills Development Act 97 of 1998

In 1998, the Skills Development Act of 1997 was enacted. The goal of the Act is to enhance the career chances of formerly disadvantaged and unfairly discriminated against individuals during the Apartheid regime, which infantilized black people via inadequate training and education.

Learnerships are a significant component of South Africa's present government-funded skills development framework. Learnerships are also utilised by students to gain qualifications assessed on the National Qualifications Framework (NQF), which ensures qualification-wide consistency (Baker, 2007). This is complemented by the Skills Development Levies Act 9 of 1999, pursuant to which the government finances apprenticeship programmes for businesses. This is pertinent to the promotion of worker upskilling in accordance with the Fourth Industrial Revolution. The government's purpose of harnessing the Fourth Industrial Revolution would be furthered if companies offered AI apprenticeships. This should also be reflected in AI-related educational policy.

2.7.2 Labour Relations Act No. 66 of 1995

The Labour Relations Act No. 66 of 1995 seeks to safeguard employees while also promoting economic growth. The Labour Relations Act, according to Karolia-Hussain and Fourie (2021), allows for collective bargaining and strike action. However, collective bargaining in the South African mining sector has failed to generate the desired effects as envisioned under the Labour Relations Act. This is because strikes are becoming more regular, and strikes are frequently violent and unprotected. The influence and significance of the Fourth Industrial Revolution on the labour law framework in the mining sector must be carefully considered. Furthermore, modifications to the legislation regarding strike action should be considered, particularly if strike action becomes more prevalent as a result of automation threatening employment, and unions should be proactive in this regard.

2.7.3 The Cybercrimes Act 19 of 2020 and the Protection of Personal Information Act 4 of 2013

On May 26, 2021, the President of the Republic of South Africa, Mr. Cyril Ramaphosa, signed the Cybercrimes Bill into law as Act 19 of 2020 (Cybercrimes Act) of the Parliament of the Republic of South Africa. The Act is enacted to regulate the rise of digitally-based criminal activities resulting from the Fourth Industrial Revolution. However, this is not the first time South Africa has attempted to regulate portions of our increasingly digital future. Other examples are the Protection of Personal Information Act 4 of 2013 (POPIA) and the recently released National Data and Cloud Policy Draft (Constitution of South Africa, 2021).

Again, the president has created a panel to examine the establishment of pertinent regulations for the Fourth Industrial Revolution. The President's Commission on the Fourth Industrial Revolution has released a new study examining the condition of technology in South Africa and potential tax reforms the nation may implement to prepare for the Fourth Industrial Revolution. The president is encouraged to explore a range of tax suggestions, including a new digital tax for multinational businesses like Netflix, Airbnb, Amazon, and Facebook. Other suggested regulations include tax efforts such as a structure on processed minerals used in Fourth Industrial Revolution components and a tax incentive for research and development for Industry 4.0 startups (Marwala, 2020).

Therefore, current law has proven enough to handle preexisting employment concerns, such as disadvantaged individuals' lack of skills. This effort is reflected in the constitution and the national

goal of redress; but, since the Fourth Industrial Revolution, law and policy have been absent due to the unpredictability of the new era. The foundation of the Commission by the President is a step in the right direction towards the creation of new acts, bills, and policies.

2.8 Theoretical framework - Human and Social Capital Theory

The human capital is an essential component of any developmental state and its ability to adapt to a changing environment is key to the realisation of national goals, such as those of the National Development Plan. Essentially, the crux of the National Development Plan is to develop South Africa's the human capital as a mechanism and vehicle for reducing the triple challenge of unemployment, poverty and inequality. As such the effects of the Fourth Industrial Revolution must be discussed in terms of how the 4IR will impact South Africa's human capital. Especially the ability of this capital to manage the many disruptions that are concomitant in the Fourth Industrial Revolution. As alluded to earlier on, the literacy of the human capital must be analysed in terms of its adaptability to an ever-changing environment whose result will determine whether they will be relevant, redundant, up-skillable or re-skillable?

Human capital theory holds that human productivity, skills, and knowledge are related to their economic and social status. According to the theory, people with more human capital are better off financially and socially because they have more access to resources, allowing them to invest in their future and become wealthier. Furthermore, the theory asserts that human capital benefits job satisfaction and workforce productivity. Human capital theory refers to habits, knowledge, and social and personality characteristics that enable people to perform labour for monetary value. Human capital refers to how people develop themselves, their lives, their income, and their skills, resulting in personal growth and, on a larger scale, economic growth, and poverty reduction (Appleton & Teal, 2002). With the Fourth Industrial Revolution and the prevalence of artificial intelligence (AI) in everyday life, the nature of human capital should change to reflect future solutions.

The relationships that an individual has at their disposal within their community, workplace, and society at large are referred to as social capital. Social capital enables people to navigate life by providing advice, referrals, and other forms of support. In the case of South Africa, due to the

nature of its inequality, access to AI and even basic Fourth Industrial Revolution knowledge would be limited to a select few. Furthermore, because spatial segregation is still prevalent in South Africa, the spread of knowledge in this regard will be limited. This necessitates government intervention through educational programmes targeting all socioeconomic groups.

2.9 Summary

This chapter discussed the four different industrial revolutions that have taken place throughout history and highlighted how advancements in technology have always posed a challenge to existing forms of employment. Despite this, workers have historically been able to adjust well to societal shifts, which is something that governments are working hard to achieve in the current revolution. In this chapter, we looked at the BRICS nations' plans and goals for the future about the Fourth Industrial Revolution. It has investigated South Africa's history as well as the country's current efforts to make use of AI and the opportunities presented by the Fourth Industrial Revolution. It has outlined the relevant policies and legislation, in addition to the theoretical underpinning that lies behind them. The methodology of this investigation will be discussed in the next chapter.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the approaches that were used in this investigation. The research design, demographic and sampling, data collection, research instrument, data analysis and verification, ethical concerns, potential limits and reflexivity, and ethical considerations are all included. This chapter focuses on the nature of qualitative research techniques, the approach used, and data gathering and analysis procedures. The chapter described qualitative research techniques and the characteristics and reasons that made them suitable for this thesis.

3.2 Research design

This dissertation's research design is inherent in the study technique, which will be briefly detailed in the next paragraph. The issues of data validity and reliability were at the centre of these processes to clarify what the dissertation employed in terms of providing clarity to the appropriate research design, selecting the right respondents for both the key informant interviews in the business sector and in academia, and the resultant technique used for data collection.

Fossey, Harvey, McDermott, and Davidson (2002) define qualitative research as an approach that describes an individual's behaviour, experience, and social circumstances without employing quantitative and statistical metrics. According to De Vos, Strydom, Fouche, and Delport (2011), qualitative research designs are used to evaluate social interactions and the perceptions of participants about these interactions. This is supported by Babbie & Mouton (2007), who assert that qualitative research does not attempt to anticipate human behaviour but rather to characterise and comprehend it.

The purpose of this study was to investigate SMME employees' perceptions of the effects of automation on employment based on their work experience in SMMEs. The Fourth Industrial Revolution is therefore the societal reality that this work seeks to define and comprehend. This study gave participants' perceptions and experiences with SMMEs precedence. Due to the nature of the issue investigated, this study employed a qualitative methodology. Swedberg (2020) believes that an exploratory research strategy is used to elucidate or clarify a phenomenon for which there is limited or insufficient evidence. This exploratory study aimed to elucidate what is considered a mysterious social phenomenon, the Fourth Industrial Revolution, while it is

happening. Standard exploratory research approaches, such as evaluating existing literature and conducting interviews, are employed in this study.

3.3 Population and sampling

The study population is the group of people who are being considered for participation in the study based on desired traits required for the research (De Vos et al., 2011). This research investigates the implications of the Fourth Industrial Revolution on employment in SMMEs. As a result, the population was made up of people who work or have worked in SMMEs.

The sampling procedure refers to the process of determining who is acceptable and adequate to be chosen to participate in the study (De Vos et al., 2011). This study used non-probability or purposive sampling. This implies that the researcher chose volunteers based on their capacity to offer data relevant to the study's topic (De Vos et al., 2011). This technique was used because the exploratory study seeks to explore, define, and analyse how the Fourth Industrial Revolution is affecting employment in SMMEs. As a result, participants who have worked in SMMEs were required to relay their experiences so that the researcher can glean relevant information.

The people who were chosen are referred to as the sample (De Vos et al., 2011). The participants must have worked in an SMME with the following characteristics:

1. The participants must be over 18 years of age, as this is the legal age of consent in South Africa.

2. Worked in a SMME between 2017 and 2022 as this allowed the participant to reflect on changes in employment over the last five years.

3. With more than five people employed, this allowed the participant to reflect on how different roles have changed over the last five years.

As the participants were of legal age, operating in their own capacity, and not representing an organization, the researcher was not required to obtain clearance from any organization. The study is not gender or age specific. The research sought participants with medium to long-term experience working in an SMME so that they can reflect on the SMME's evolution over time. The participant had to be familiar with business and employee functions to offer information on how

these have evolved over time. The participant's employer must have at least five employees in order for the participant to give information regarding employee retention.

The researcher located individuals who satisfied the sample requirements and solicited their participation in the study. The researcher provided willing volunteers with information about the objectives of the study and a consent form. The following sections of this dissertation will elaborate on these processes. This is regarded as the sampling method.

3.4 Data collection methods

This study employed a semi-structured approach and one-on-one interviews using an online video platform. The interviewer was able to examine nonverbal cues when using video calling (De Vos et al., 2011). End-to-end encrypted platforms was used to prevent outside observers from watching interviews. This technique of data collection was employed since the nature of the study is the Fourth Industrial Revolution, and hence it is appropriate to use Fourth Industrial Revolution technology.

The purpose of using a semi-structured interview schedule was to guarantee that both the participant and the interviewer stay on topic so that in-depth, rich information may be revealed (Minichiello et al., 1990). One-on-one interviews were used to enhance responsiveness and candour as participants discussed their own experiences, sentiments, and society (Fossey et al., 2002). This strategy allowed the interviewer to investigate participant responses while the participant communicated without fear of peer judgement. Despite this, it is noted that a drawback of a semi-structured interview, even though the interview is done one-on-one, might result in a participant delivering the interviewer's comments that the participant perceives as 'right' or what the interviewer wants to hear (ibid.). This was addressed by telling the participant before the interview that there are no wrong answers to the questions to be posed to them, all their views were valid and would be incorporated and appreciated.

3.5 Data collection instruments

Data was collected from one-on-one interviews where the responses from the participants were recorded. In this method of data collection, the data gathering tools consist of a tape recorder that is integrated into most online video conference systems, such as Zoom and Microsoft Teams. This enabled the interviewer to refer to the dialogue for clarification and to quote the participant directly

to give the person's voice precedence. The interviewer adhered to the semi-structured interview schedule and take notes during the session.

3.6 Data analysis

The act of examining the information that was acquired in the data gathering phase, synthesising it, and interpreting it is what is meant by the term "data analysis" (Fossey et al., 2002). Tesch's (1990) analytical technique, which consists of eight phases of analysing the data, serves as the foundation for this research.

1. Review the data from transcripts and notes taken.
2. Identify recurring themes while applying them to the research objectives.
3. Label the recurring themes, which can be divided into categories and sub-categories.
4. Code the themes, categories, and subcategories by associating meaning to the overarching labels.
5. Create a synthesised list where all coded themes, categories, and subcategories are grouped.
6. Refine the coded themes, categories, and subcategories for an enhanced coding frame.
7. Conduct a preliminary analysis of the data collected for each coded theme and category.
8. Compare the analysis of the findings in relation to the literature review, provide a reflection of the findings versus the research assumptions, and discuss the divergence across participants (Tesch, 1990: 142-145).

Following from the above, this study evaluated the acquired data, categorised it into recurring themes, and determined how the data results were connected to the research and where it differed. Tesch's (1990) analytical approach enabled the researcher to simplify the data so that it could be comprehended according to the researcher's conceptions, as well as to investigate the relationships in the data while flagging potential gaps, oversights, and areas for additional investigation.

3.7 Data verification

The correctness of the data reported in research is referred to as data verification. According to Lincoln and Guba (1985), for data to be verified, it must demonstrate credibility, transferability, dependability, and confirmability. Wallendorf and Belk (1989) introduced the assessment of integrity to the data verification outline of Lincoln & Guba.

3.7.1 Credibility

Establishing trust in research findings is referred to as "credibility" (Anney, 2014). It is therefore critical for the researcher to confirm that the information represented is authentic to the participants' original data, which was accomplished through peer debriefing. According to Guba (1981), researchers should validate their findings through academic advice. Throughout the study, but especially during the dissertation writing process, an academic supervisor provided help. The supervisor looked at the data collection procedure, data management, data analysis technique, and results.

The researcher incorporated negative case analysis to increase the credibility of the study. The term "negative case analysis" refers to conclusions that differ from those found in the study's literature review (Bitsch, 2005). This increases the credibility of the research by providing alternative explanations for the study that the researcher may not have considered rather than simply providing data that matches the study's assumptions. Finally, to enhance the credibility of this study, the researcher recorded the interviews for referential adequacy.

3.7.2 Transferability

Transferability refers to the applicability of the findings to a new location or setting with different participants and respondents (Anney, 2014). Transferability was accomplished by utilising detailed descriptions (Li, 2004). Other researchers will be able to duplicate this work if the approach is thoroughly described. As a result, the researcher has provided detailed analyses of how the data was collected and processed throughout this chapter.

In addition, to boost the generalisability of the study, the sampling technique (purposive sampling) assures that the data collected from participants is comprehensive and rich, since the participants were picked based on a criterion indicating their subject matter expertise (Schutt, 2006). Other researchers may repeat the study using the same criteria.

3.7.3 Dependability

The term dependability relates to whether the results would be consistent if the setting or participants were the same (Anney, 2014). According to Bitsch (2005: 86), it is "the consistency of findings throughout time." The study's dependability is inextricably linked to its credibility. An audit trail of all research choices and actions, such as raw data, interview notes, and documents

obtained during interviews, is one approach to ensuring reliability (Lincoln & Guba, 1985). This study preserved an audit trail for the academic supervisor to investigate. Furthermore, in order to boost dependability, the study conducted peer debriefing, in which the researcher reviewed the research method and findings with a neutral colleague in the field as a form of reflection and to potentially discover bad situations.

3.7.4 Confirmability

Confirmability refers to the extent to which other studies can verify the findings (Anney, 2014). To achieve confirmability, an audit trail and a reflection process, as described above, ensured that the conclusions are drawn from the data gathered from the participants, rather than the researcher just verifying the study's hypotheses and objectives. The audit trail and reflection procedure generated input from other researchers on the veracity and dependability of the findings.

3.8 Limitations of the study

There were two key limitations to this study. First, there were insufficient time and resources to conduct thorough research covering most sectors within the SMME sector. The second limitation was conceptual, and it emanated from the fact that the study concentrated only on the impact of automation on job losses in the SMMEs sector and did not examine other sectors, such as banking, education, agriculture, etc., where automation is also having an effect. Other limitations are described below.

3.8.1 Assessing Integrity

General limitations to the study was the integrity of the data. Assessing Integrity refers to determining whether interview participants are honest in their replies (Wallendorf & Belk, 1989). Participants may submit incorrect information for a variety of reasons, including discomfort with the questions posed or distrust in the researcher. To counteract this, prior to the interview, the researcher established rapport with the subject and ensure that the participant were aware of the topic and type of questions that would be asked (Anney, 2014). It was also critical to ensure that the participants stayed anonymous to make the person feel at ease.

3.8.2 Qualitative Research

One of the limitations of this study is ascribed to the common problems associated with qualitative studies. Since qualitative studies often use a limited sample, their findings are often unapplicable to a wider population. This is due to the fact that qualitative studies tend to have a smaller sample size. The sample size for this study is twenty people, and due to the fact that the selection criteria are not representative of the South African population as a whole, the findings cannot be generalised to apply to the entirety of the country. However, this is not the aim of the research. Through gathering the views of directors and managers of the sampled SMMEs, the goal of this research was to gain an understanding of how the Fourth Industrial Revolution is unfolding within such organisations and the concomitant challenges faced as organisations try to cope.

According to Babbie and Mouton (2007), qualitative research is constrained by the bias that is conveyed from researcher to participant, which influences the study's conclusions. This is countered by the researcher's awareness of potential bias and the researcher's obtaining scholarly counsel from an academic supervisor.

3.8.3 Data Collection & Data Collection Instruments

De Vos et al. (2005) state that the quality of the data that is collected from participants is dependent on the researcher’s skill in interviewing. This was avoided as the researcher prepareds a quiet space for the interviews, used an interview schedule to ensure that the discussion was productive, and time conscious (De Vos et al., 2005). Using these interview principles, the researcher gleaned substantive information to present in the findings.

The volume of data collected is large and could be difficult to analyse (De Vos et al., 2005). This is especially true given the duration for which the interviews were conducted. This was negated through guidance from an academic supervisor. The use of recording interviews may pose a limitation, as participants may be weary of expressing themselves fully and honestly due to being recorded. Thus, it was imperative that the researcher assure the participant of how the recordings would be stored and managed to protect the participant's anonymity.

3.9 Reflexivity

In the process of producing knowledge, the researchers' personal views, experiences, and interests may affect the objectivity of the study, and examining this is reflexivity. Gray (2008) states that reflexivity is a reflection on whether the study is influenced by the researcher's relationship to the topic. To practise reflexivity, Pillow (2010) recommends keeping a journal where the researcher reflects on the various stages of the study to be aware of the voice of the researcher. This study made use of this study to ground the researcher. The researcher being conscious of their bias goes a long way, especially on matters such as gender, race, class, sexuality, ethnicity, and nationality.

3.10 Ethical considerations

Ethical considerations are the deliberate attempt to protect human subjects (participants) from potential harm which the study may inflict (Arifin, 2018). This study's ethical guidelines are in accordance with The Professional Board for Psychology, Health Professions Council of South Africa 18/5/B (2000), as cited in Babbie and Mouton (2010).

3.10.1 Informed Consent and Voluntary Participation

To obtain informed consent, the researcher adequately informed the potential participant about the research project, the types of questions that would be asked, how the information would be used, and what is expected of them (Arifin, 2018). The researcher gave the participant the opportunity to raise any concerns and ask questions. The participants were competent to consent, meaning that they were over the age of 18 and have no mental disability that would hinder their ability to consent (ibid.). Thereafter, the participant may voluntarily chose to participate in the study. When agreeing to participate, the participant provided written consent. The researcher followed this guideline and assured participants that they could withdraw from the study at any time with no repercussions.

3.10.2 Anonymity and Confidentiality

Anonymity and confidentiality are maintained by not revealing the identity of the participant throughout the data collection process, the analysis of the data, and when documenting the findings (ibid.). This is critical to ensuring that the participant feels comfortable sharing in-depth about their experience while knowing that it will not be used against them in any way. To further protect the anonymity and confidentiality of the participant, the researcher ensured that all voice recordings of interviews cannot be accessed by a third party. Furthermore, in the data analysis and tabling of

the findings, the researcher made use of pseudonyms, and aspects of their identity that make them identifiable were removed.

The written consent forms signed by the participant is kept safely and inaccessible to third parties. The participant was informed that their age and a description of their role at work will be used in the findings, but their company and other identifiable details were kept anonymous.

3.10.3 Deception of Participants

Deception of participants refers to the researcher deliberately misinforming the participant on matters of the study (De Vos et al., 2011). This study commits to not deceive participants, as this would be a gross breach of informed consent and trust, which may result in the participant's harm.

3.10.4 Avoidance of Harm

In a study, harm may be both physical and psychological (Arifin, 2018). In social science where participants are interviewed, the greatest risk may be psychological harm, which may be a result of the questions asked that can be triggering or a breach of confidentiality that may have far-reaching effects on the participant's personal life. To avoid psychological harm, a debriefing session was followed for all interviews. Local community support groups and counselling services would be engaged, should the researcher be informed of any psychological ramifications of the interview. All measures mentioned in 3.10.2 to avoid the breach of confidentiality and anonymity were followed to avoid the potential harm of such a breach.

3.10.5 Debriefing

The process of debriefing allows the participant to reflect post-interview (Cozby, 2009). The purpose of debriefing is to allow the participant to raise concerns, complaints, and any misinterpretations that may have been a result of the interview. This was achieved by follow-up questions around how the participant felt post-interview. It sought to identify if the participants were experiencing any negative feelings as a result of the questions asked in the interview. None of the participants reported any such feelings post-interview.

3.11 Summary

Thus, this chapter has provided the methodological underpinnings of the study it has outlined the research methodology that was used and showed the careful consideration of the ethical guidelines that this study committed to.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 Introduction

In this chapter, we focused on the implications of the Fourth Industrial Revolution on employment in the SMME sector while presenting the study findings. The findings reported in this chapter were derived from an analysis of data acquired through semi-structured interviews. The instrument, which comprises five parts, five themes, and twelve subthemes, addressed the study questions and objectives and provided responses to the research questions. The presentation of the study's findings was based on primary research, and the discussion and interpretation of the findings were also offered with regard to the research's purpose and objectives. There was a correlation between the study's findings and the literature review.

4.2 Participants' Response Rate

A total of 20 participants were involved in this study. There is need to justify why 20 participants were involved. Firstly, the COVID 19 pandemic was still present when the fieldwork was done, and this drastically reduced the number of responds that were available. Secondly, as alluded to in the study delimitations, time was a huge factor in the sourcing of the correct respondents to the study. The 20 that were interviewed with deemed to constitute a valid representation of the sample given the circumstances alluded to above.

Of the 20 participants who were recruited for the study, 17 interviews were conducted using a semi-structured interview schedule, accounting for only 85% of the total. Three individual participants influenced the response rates because they were either unresponsive or did not honour interview invitations. This is due to trust, fairness, colleague significance, and data management and protection, despite the fact that this issue was addressed in the covering letter and the permission letter to conduct the study (Schutte-Lyth, 2015:43). Because of the country's current economic insecurity, the individuals from these three SMMEs firms may regard the interview as less significant than any obligation that they may have. According to Fosnacht, Sarraf, Howe, and Peck (2017:21-22), response rates had little effect on the study since it concentrated less on obtaining the desired rate of 20 participants and more on assessing, analysing, interpreting, and applying the data obtained.

4.3 Participants' Biographical Information

The tables below present the section containing a general biographical information of the seventeen SMMEs participants with their roles in the Gauteng Province. The presentation of the findings concerning the participant's gender, age, ethnic groups, and duration at company is provided in sub-sections.

4.3.1 Participants' Gender

Table 4.1 provides a presentation of the distribution of the study participants by gender.

Table 4.1: Participants' Gender

Gender	**Frequency**	**Percentage**
Female	9	53%
Male	8	47%
Total	**17**	**100%**

As shown above on Table 4.1, most of the study participants were nine females which constitute a 53% and eight males which constitute a 47% of the participants.

4.3.2 Participants' Age

Table 4.2 below displays a presentation of the distribution of the study participants by age.

Table 4.2: Participants' Age

Age	**Frequency**	**Percentage**
25 – 29	2	12%
30 – 34	3	18%
35 – 39	5	29%
40 – 44	2	12%
45 – 49	2	12%
50 – 54	2	12%
55 – 59	1	6%
Total	**17**	**100%**

As demonstrated in Table 4.2, all respondents were between the ages of 25 and 59, constituting a response rate of 100 per cent. The research also found that there were fewer participants in the age groups 25–34, 40–54, which ranged from 12% to 18%, and 55–59, which comprised 6% of the demographic group. The conclusions of this study were consistent with those of SEDA (2022), which ascribed a low number of SMME owners in the age ranges of 25–29 and 55+ to their decision to exit the labour force in July 2021 owing to the COVID-19 pandemic and social instability. It was also found out that adults between the ages of 35 and 50 were more resilient because they had greater responsibilities, such as family obligations and heading up households (SEDA, 2022:17).

4.3.3 Participants' Ethnic groups

The following Table 4.3 shows the distribution of the study participants by their ethnic groups.

Table 4.3: Participants' Ethnic Groups

Ethic Group	Frequency	Percentage
Black	8	47%
White	4	24%
Coloured	4	24%
Indian/Asian	1	6%
Total	**17**	**100%**

As illustrated on Table 4.3 above, 47% of the study population are black people, whereas whites and coloureds have 24% of each group's population. The Indian/Asian category accounts for 6% of the population, which is the lowest compared to the rest of the racial groups. The findings obtained from this study were in line with those of the Second Quarterly Labour Force Survey (2022) from Stats SA, which showed that 72.7% of SMME owners are black, followed by white owners, who account for 19.5%, Coloured 3.4%, and Indian/Asian accounting for 4.5%. Therefore, these findings show that SMMEs in Gauteng are majorly black-owned.

4.4 Employment Information

Table 4.4 to 4.6 provides a presentation of the distribution of the study participants by employment information.

4.4.1 Participants' Role

The following Table 4.4 provides a presentation of the distribution of the study participants by role in the company.

Table 4.4: **Participants' Role**

Role	**Frequency**	**Percentage**
Director	15	88%
Manager	2	12%
Total	**17**	**100%**

As illustrated on Table 4.4 above, the majority of 88% of the participants were Directors to the companies and 12% were employed as managers.

Table 4.5: Participants' Duration at Company

Duration at Company	**Frequency**	**Percentage**
5 years	9	53%
6 years	0	0%
7 years	2	12%
8 years	2	12%
9 years	2	12%
10 years	1	6%
11 years	0	0%
12 years	0	0%
13 years	1	6%
14 years	0	0%
+ 15 years	0	0%
Total	**17**	**100%**

Based on the findings presented in Table 4.5 above, the majority of the respondents (53%) were in their job roles for 5 years. Participants with seven, eight, and nine years constituted about 12% each, and participants with 10 years and 13 years were six percent each. The findings obtained from this study were in line with Stats SA (2022) that accounts for 22.2% of SMMEs falling within enterprise age of 6-10 years old followed by 20% 11-20 years old.

4.5 Data Analysis and Interpretation of Findings

Data was presented in themes and sub-themes to address the aims and objectives of this study in relation to the study participants' responses.

4.5.1 Objective 1: To determine if automation is being used by SMMEs.

The study's first goal was to determine whether SMMEs used automation. This subsection discussed the presentation and interpretation of research findings in relation to the use of automation by SMMEs. E-commerce from a physical store, office administration, some finance tools, manufacturing equipment, sales through a website and automatic pay-gates, and digital marketing were identified as automated activities by SMMEs in Gauteng during the research process.

4.5.1.1 Theme 1: In the last five years, has the company automated any functions?

21% of the population group indicated that the company has utilised automation in the last five years with 29% percent indicting that they have not implemented any automation in the company during the research process. The following views were expressed by participants:

Participant 2, 3, 4, 5, 6, 7, 8, 10, 12, 14 and 17 said: *"Yes" to automation to the company in the last five years.*

Participant 9, 11, 13, 15 and 16 stated reiterated: *"No" to automation in the past five years.*
The responses shared by the above participants revealed that SMMEs in Gauteng have automated some of their business activities in the past five years. The findings of this study were consistent with those of SEDA (2022), which acknowledges the changes brought about by the Fourth Industrial Revolution in manufacturing and distribution processes, as well as how they have integrated supply chains. It emphasises financial system changes, such as mobile payment options and other cashless, automated solutions. It further states that, as of January 2021, 38.2 million

South Africans were internet users and actively using various social media platforms. This has prompted growth in SMMEs advertising online and on social media, a shift from traditional marketing. (SEDA, 2022). Therefore, the findings identified 71% of SMMEs as having embraced automation in the past five years, with 29% indicating that they are still not automated.

4.5.1.2 Sub-Theme 1.1: What forms of Automation has the company implemented?

The study's first goal was to determine whether SMMEs used automation. This subsection discussed the presentation and interpretation of research findings in relation to the use of automation by SMMEs. E-commerce from physical stores, office administration, some finance tools, manufacturing equipment, sales through websites and automatic pay-gates, and digital marketing were identified as automated activities by SMMEs in Gauteng during the research process. The following views were expressed by participants:

Participant 1 stated: *"The company has used automation in our administration and CV sourcing on platforms like LinkedIn and Pnet, this gives us access to large amounts of data, automatically."*

Participant 2 stated: *"We have introduced automation in our response handling (emails, calls), payroll and administration."*

Participant 3 indicated: *"We have a paperless system for all business functions".*

Participant 4 stated: *"We use automation in our digital administration, virtual training services and its very effective".*

Participant 5 stated: "*Development operations within the IT space".*

Participant 6 reiterated: *"Administration, buying, servicing is the only area which we are using automation in the business systems".*

Participant 7 stated: *"E-commerce from physical store".*

Participant 8 stated: *"Office administration, some finance tools however, the manufacturing equipment was automated over 8 years ago."*

Participant 9 stated: *"None."*

Participant 10 stated: *"Sales through website and automatic pay-gate".*

Participant 11 reiterated: *"None"*

Participant 12 stated: *"Marketing."*

Participant 13 stated: *"We don't have any automation introduced in the company; we are still using manual systems".*

Participant 14 stated: *"Administration, bookings/sales, payments".*

Participant 15 observed: *"Not at the moment"*

Participant 16 indicated: *"None".*

Participant 17 stated: *"Packing".*

Based upon the research findings, it was found that most businesses have introduced some form of automation to their operations, with many stating that administrative and bookkeeping functions have been automated by apps. Most SMMEs have embraced new ways of working, such as conducting business virtually and becoming paperless.

4.5.1.3 Sub-Theme 1.2: What is the company's attitude towards the Fourth Industrial Revolution?

Half of the participants felt positively about the Fourth Industrial Revolution. While others felt indifferent about it and a smaller few felt negatively about the Fourth Industrial Revolution.

Participant 3, 5, 6, 7, 11, 14 and 17 observed: *"We are championing the revolution", "excited to be competitors in the revolution"; "Plan to harness it" and "Excited about the new opportunities."*

Participant 1, 2, 4 and 8 stated the following, respectively: *"Negative, confused on what to do about it"; "Negative, uncomfortable and feel that limited resources are preventing progress in this regard"; "Negative, South Africa is not ready" and "Negative, company does not look to partake in the changes".*

Participant 9, 10, 12, 13, 15 and 16 indicated: "*Indifferent" and one participant stating that "It will not affect the food industry that much".*

Based upon the research findings, it was acknowledged that there are different views about the company's attitude towards the Fourth Industrial Revolution among SMMEs in Gauteng. The findings revealed that most negative responses came from people working in finance and business services, who later identified their core businesses as being threatened by automation. The one negative response that did not fall within this industry came from the manufacturing industry, and it was attributed to the lack of interest in partaking in automation as it was a long-standing business that was comfortable without the changes.

4.5.2 Objective 2: examine if automation is leading to job losses

Objective two of the study was concerned with examining if automation in the SMMEs is leading to job losses in Gauteng. The presentation and interpretation of the research findings were discussed in this subsection in relation to the examination of automation in the SMMEs and whether it is the leading cause of job losses in Gauteng. Only three out of 17 participants reported that staff had lost their job due to automation. One of the three participants attributed the job loss of a receptionist to the closure of the office due to COVID-19 and the functions then becoming automated via AI response handling mechanics, where the person was most valuable when managing the office and attending to walk-in clients. The vast majority (83%) stated that no jobs had been lost and that automation was directly to blame.

4.5.2.1 Theme 2: In the last five years, have people lost their job due to the role being filled by some form of automation?

Job losses were identified in roles such as administration, receptionist, accountant, system testers, data capture, cashiers, security guards, cleaners, and packers due to the roles being filled by some form of automation during the research process. People who lost their jobs were earning anything less than R5 000-R10 000 per month. The age range was 20-24, 25-30, and two people were 40-44 years old. The following views were expressed by participants:

Yes/No

Participants 1, 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15 and 16 stated: *"No" with two participants indicating that "people employed on internship contracts were lost job due to COVID19 pandemic".*

Participants 2, 5, 7 and 17 indicated: *"Yes."*

a. If yes, what role (s)

Participants 2, 5, 7 and 17 reiterated: *Job losses were from roles such as Administration, Receptionist, Accountant, System testers, Data capturer, Cashiers, Securities, Cleaner and Packers.*

b. How many people have lost their job?

Participants 2, 5, 7 and 17 observed: *Fifteen employees were reported as people that have lost their jobs due to the role being filled by automation.*

c. What were the characteristics of those who lost their jobs?

Age: 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65+

Wage: <R5000; R5000-R10 000; R10 000- R15 000; R15 000-R20 000; R20 000-R25 000; R25 000-R30 000; R30 000-R35 000; R40 000-R45 000; R50 000 +

Education attainment: < Less matric; Matric; some tertiary; tertiary qualification; some post-graduate; post-graduate qualification

d. What category would that role fall into?

Entry-level/ Mid-level/ Senior, Manager/ Director/Executive, or a contract role

Participant 2 stated: *"the two employees who lost their jobs due to automation were Intern/Receptionist which was in the age group 20-24. They were earning from R5000-R10 000 per month and they had some tertiary level qualification. This was an entry-level job. The second employee was the accountant which was in the age group 35-39 years, they were earning between R25 000-R30 000, and they had tertiary level qualification and were employed at a middle level in the company."*

Participants 5 indicate: *"Five employees within the IT Unit namely, system testers and Data Capturer, lost their jobs. The four system testers were between age group 20-24, some had a tertiary qualification or some tertiary education that was uncompleted. Their salary was between R5000-R10 000 per month.*

The data capturer was between age group 35-40 years, the person had only matric and earned between R15 000-R20 000. They were employed at middle level because of their roles and amount of confidentiality.

Participant 7 closed a physical store that trades leisure items and moved to an e-commerce method of trade. Participant 7 observed: *"Three Cashiers, Three Security Guards and a cleaner lost their jobs. The Cashiers were earning between R5 000-R10 000 whereas Securities and Cleaner were paid less than R5 000 per month. The age group varied really, and I think it was because of skill requirement because Cashiers were between age 20-24, Securities were between 40-44 years and the Cleaner was between age 55-59 years. These people were all employed entry level."*

Participant 17 observed: "*There were only two packers that lost their jobs who were between age 25-30 years. They were earning very little though, less than R5000 per month and had only matric as qualification. They were employed at entry level in the company."*

Based upon the research findings, it was found that most people who lost their job to automation fell within the age range of 20–24. All the employees were entry-level to mid-level hires earning less than R5000 to R10,000, with a few earning in the brackets above that. No senior or managerial hires are reported to have lost their jobs due to automation.

4.5.2.2 Sub-Theme 2.1: Do you feel that technology, automation is affecting employment in your company?

Participants 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15 and 16 stated: *"No"* with three participants indicating that "*it is encouraging employment as the business is growing quickly", "it has grown the company"* and "*it has grown the company through things like UberEATS."*

Participants 2, 5, 7 and 17 indicated: *"Yes."* – all of which reported job losses due to automation.

4.5.2.3 Sub-Theme 2.2: Do you feel that technology, automation is affecting employment in your industry?

It was found out that 65% of the participants stated that technology and automation were affecting employment within their industry. Some participants expressed that automation decreased the responsibilities of roles and, thus, SMMEs required less staff in departments. Furthermore, some participants expressed that jobs were also being lost because of the COVID-19 pandemic. The following views were expressed by participants:

Participants 1, 2, 3, 4, 5, 6, 7, 8, 11, 14 and 17 stated: *"Yes" with some participant indicating that, "Jobs are made easier, and less people are then required".*

Participants 9, 10, 12, 13, 15 and 16 indicated: *"No" with some participants indicating that "we offer services to the built environment industry, and they are unable to replicate our services using AI" and "the e-commerce space is creating jobs."*

Based upon the research findings, it has been found that most participants in the finance and business services industry and all the participants within the manufacturing industry believed that technology and automation were resulting in job losses. Most organisations stated that day-to-day responsibilities are being made easier by technology and automation, and therefore, fewer staff are required. However, none believed that human labour was being replaced completely. Within the manufacturing industry, it is noted that manual labour is being automated by specialised equipment, but labourers are still required to operate the equipment, and only a few are absorbed into this role. These responses constituted 65%.

The research further found that 35% of participants did not think that technology and automation were affecting employment in their industry. Most of these were participants in the trade and accommodation industries, with some reporting that business was growing rapidly through e-commerce selling platforms such as websites, UberEATS, and AirBnb.

4.5.3 Objective 3: To examine if SMMEs have contingency plans to prevent job losses.

Objective three of the study was concerned with examining if SMMEs have contingency plans to prevent job losses in Gauteng. The presentation and interpretation of the research findings were discussed in this subsection in relation to the examination of the SMMEs contingency plans to

prevent job losses in Gauteng. 65% had no contingency plans in place to prevent job losses through upskilling programs, while 35% were implementing some form of upskilling program. Most participants believed that upskilling was the only way of preventing job losses, with some also expressing that business survival and growth were also imperative to preventing job losses.

4.5.3.1 Theme 3: Does the company have any educational/upskill programmes?

65% of the participants stated that the SMME did not have any upskilling programs, and 35% said that they did have upskilling programmes. In one case, the upskilling programmes were free as part of a membership benefit from Microsoft. Another case-free programme is available for the use of new equipment. Other programmes included online short courses, project management courses, and health and safety training, which were identified as some of the educational and/or upskilling programmes provided by SMMEs to their employees.

Out of the 65% of participants that had no upskilling programmes offered, exactly half of the SMMEs stated that some form of programme would be implemented when there were additional employees. While the other half stated that no upskilling programme would be introduced as the responsibilities were mostly strengthened through experience, one stated that the company does not intend to engage in automating the business and therefore will not upskill workers also due to cost cutting. The following views were expressed by participants:

Are there educational/upskilling programmes - Yes/No

Participants 1, 2, 4, 6, 7, 8, 10, 11, 12, 13 and 15 stated: *"No" with one indicating that, "not formal but employees are upskilled as they come in with no skills and are trained."*

Participant 3, 5, 9, 14, 16 and 17 stated: *"Yes."*

If so, what programmes?

Participants 3 stated: *"Online short courses."*

Participants 5 indicated: "*Free programmes from Microsoft."*

Participants 9 noted: "*Project management."*

Participants 14 stated: "*Short course in Housekeeping."*

Participants 15 noted: "*No."*

Participants 16 indicated: "*Short courses on Professionalism."*

Participants 17 stated: "*Short courses on New Equipment, Health and Safety."*

If no, Does the company intend on creating any educational/upskill programmes?

Participants 1, 2, 8, 9, 12 and 15 stated: *"No". Other participants indicated the following: "until there are more employees, but the director's experience is sufficient"; "it is more experienced based that fine tunes skills" and "the company tries to cut costs at all costs".*

Participants 4, 6, 7, 10, 11 and 13 indicated: "*Yes". With some participants indicating "when there is budget and need"; "Yes, programmes around marketing and creative work" and "when there are more employees".*

Based on the research findings, as per the research assumption, most SMMEs do not have contingency plans to prevent job losses due to automation, as most do not have any educational or upskilling programme. Half of those who did not have any educational or upskilling programmes intended to create such programmes as the business grew and the staff complement increased.

4.5.3.2 Sub-Theme 3.1: Do you think there are other ways to prevent job losses in your business?

70% of participants stated that the only way to prevent job losses in SMMEs is through educational and upskilling programmes while 30% stated that business survival and growth was another way to ensure jobs are secured. With some comments such as "Diversify business as business is becoming obsolete" The following views were expressed by participants:

Participants 1, 2, 3, 5, 6, 7, 11, 12, 14, 15, 16 and 17 stated: *"No."*

Participants 4 indicated: *"Diversify business as business is becoming obsolete."*

Participants 8 stated: *"Upskilling especially with the type of robotics becoming prevalent in manufacturing. But it will not absorb everyone."*

Participants 10 indicated: *"Business growth."*

Participants 13 stated: *"Partnering with technology."*

Participants 9 indicated: *"Yes."*

Based upon the research findings, participants believe that preventing job losses in SMMEs is highly dependent on upskilling and educational programmes.

4.5.4 Objective 4: To examine if the standards of employability characteristics have changed.

Objective four of the study was to determine if the standards of employability characteristics were changing within the SMMEs in Gauteng. as well as examining if employment itself has changed. 70% of participants reported that responsibilities had changed due to automation, while 30% said no. Only 17% of respondents believed that administrative and financial roles were becoming obsolete. The majority, however, expressed that roles are becoming thin but not obsolete.

When asked what are considered desirable skills that the SMME seeks, most listed soft skills such as the desire to learn, adaptability, resilience, and creativity. Some participants stated that sales orientation, marketing on digital platforms, and a strong knowledge base of digital platforms were also desirable. 47% of participants prioritised educational qualifications in the hiring process, with some even commenting that education builds discipline and is a good knowledge base. 23 percent prioritised automation skills, another 23 percent said neither, and the remaining 7 percent said both education and automation skills.

4.5.4.1 Theme 4: Have any responsibilities changed within roles due to automation?

70% of participants stated that responsibilities had changed due to automation with most stating that the change occurred in day-to-day functions.

Participant 1 stated: *"Yes, day-to-day, core functions such as CV sourcing."*

Participant 2 stated: *"Yes, day-to-day functions are becoming automated and less time consuming thus, staff are output focused."*

Participant 3 stated: *"Yes."*

Participant 4 stated: *"Yes, day-to-day functions."*

Participant 5 stated: *"Yes, functions have moved from software development to development operations."*

Participant 6 stated: *"Yes, network monitoring is done on an app and on a phone, nobody is manually doing it whereas in the beginning they were."*

Participant 7 stated: *"Yes, business is no longer face-to-face."*

Participant 8 stated: *"Yes, office functions, administration and finance."*

Participant 10 stated: *"Yes, processing orders/administration."*

Participant 14 stated: *"Yes, less administration with booking and finance."*

Participant 17 stated: *"Yes, packaging is quality checked."*

Participants 9, 11, 12, 13, 15 and 16 stated: *"No."*

Based upon the research findings, it is found that most participants believed that responsibilities had changed due to automation, with most reporting that day-to-day functions such as administration, bookkeeping, and response handling had changed. The subjective correlates with the objective, as most participants report having implemented some form of AI. Thus, it can be deduced that SMMEs are implementing some form of automation, which is changing the landscape of the responsibilities of employees.

4.5.4.2 Sub-Theme 4.1: Does the company foresee certain roles becoming obsolete?

Only three of the 17 participants stated that they believe some roles are becoming obsolete, with the majority of the participants stating that they do not believe any roles are becoming obsolete but are rather thinning in number. The following views were expressed by participants:

Participants 1, 2 and 17 stated: *"Yes."*

Participants 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 stated: *"No."*

f so which roles and why?

Participants 1 stated: *"Office roles such as administration and finance."*

Participant 2 stated: *"Administration and full-time finance."*

Participant 17 indicated: *"Manual roles depending on equipment."*

Based upon the research findings, it was found that the participants who reported roles becoming obsolete were those who reported job losses within their SMME due to automation. These participants stated that roles such as administration staff who perform traditional administration tasks such as greeting and welcoming visitors to the office, filing, and response handling are becoming obsolete. as well as bookkeeping and finance personnel. This is partly due to automation, where these responsibilities are being performed through applications; however, this is also due to COVID-19 and offices being closed and new ways of working being implemented. Thus, it is difficult to solely attribute it to automation.

Furthermore, a role that is also said to be becoming obsolete is finance and/or bookkeeping. The participant expressed that those functions, such as payroll, are automated via most banking applications. Other tools such as Sage allow businesses to keep track of financial matters such as invoices, purchase orders, etc. Thus, having a full-time finance employee is not needed, but for finance matters such as tax returns, SMMEs contract a finance person for the task. This shows that the role has diminished from a full-time role to a "free-lance" sort of role, but the role has not become obsolete altogether.

4.5.4.3 Sub-Theme 4.2: What skills does the company look for during the recruitment process? *Did you previously require these skills?*

Participants expressed various skills that they seek when engaged in the recruitment process. Most, however, expressed that they look for candidates who have a desire to learn. This seems to come from an SME's reliance on the founder of the business to lead the company in meeting its needs by teaching employees what needs to be done. Furthermore, SMMEs have tight budgets and thus do not seek to hire qualified staff to perform one role but rather someone who does not necessarily have tertiary qualifications as their cost to the company is usually lower and they are more willing to perform multiple roles.

Participants also expressed that soft skills were most desirable when recruiting. skills such as adaptability, resilience, professionalism, and discipline, with some stating that through the pursuit

of tertiary qualifications, these soft skills are imparted. And this response was found across the three industries, independent of automation implementation.

Another emerging skill that participants described as desirable is marketing within digital platforms, as well as content creation for social media marketing. This was associated with a sales-oriented mindset, which was described as desirable. The following views were expressed by participants:

Participants 2 stated: *"Data analysis, became prevalent in the last couple of years."*

Participants 3 reiterated: *"Digital/IT skills in operating the systems."*

Participants 5 observed: *"Desire to learn, show adaptability."*

Participants 6 noted: *"Desire to learn, computer savvy (being able to operate apps)."*

Participants 7 noted: *"Desire to learn, computer skills, marketing and creative skills around content creation for social media."*

Participants 8 stated: *"Sales orientation especially in digital platforms."*

Participants 10 reiterated: *"Digital marketing and content creation."*

Participants 12 stated: *"Creative people, strong in research."*

Participants 17 stated: *"Skills in operation."*

4.5.4.4 Sub-Theme 4.3: What emphasis does the company place on education vs. skills in automation?

Eight of the participants prioritised educational qualifications in the hiring process, with some even commenting that education builds discipline and is a good knowledge base. Four people prioritised automation skills, four others said neither, and one person said both..

Participants 3 stated: *"Both."*

Participants 1, 2, 4, 7, 8, 9, 14 and 16 stated: *"Education" with one participant indicating that "knowledge foundation and the discipline from studying is also critical."*

Participants 5, 6, 10 and 17 stated: *"Skills in automation" one participant indicated that "traditional roles like accounting, then qualification."*

Participants 11, 12, 13 and 15 stated: *"Neither."*

Based upon the research findings, it was found that participants who earlier reported feeling "indifferent" about the Fourth Industrial Revolution reported prioritising neither education nor skills in automation. Where participants stated that education was prioritised over skills in automation, it was often people who felt negatively about the Fourth Industrial Revolution. Then, where it was reported that skills in automation are prioritised, it was expressed by participants who felt positively about the Fourth Industrial Revolution and looked to "champion the revolution." Thus, the priority of educational attainment over skills in automation is closely related to the SMMEs attitude towards the Fourth Industrial Revolution.

It should be noted, however, that participants who expressed excitement about the Fourth Industrial Revolution and prioritised automation skills over educational attainment still stated that for traditional or "important" functions such as finance, it would be preferable for the person to have educational qualifications because they viewed these as symbols of trustworthiness.

4.5.5 Objective 5: To identify whether the Fourth Industrial Revolution is having a negative or positive effect on in employment in SMMEs.

Objective five of the study was concerned with identifying whether the Fourth Industrial Revolution is having a negative or positive effect on employment in SMMEs in Gauteng. Under this objective, the study was also concerned with informing and recommending strategies for combating unemployment because of job losses due to automation.

Participants largely reported that the challenges around automation were the costs involved in implementing new technologies. Almost half of the participants stated that they did not have any challenges, and this correlated with the participants who reported their businesses being advanced by the Fourth Industrial Revolution, and this occurred most frequently in the trade and accommodation industries. When determining if automation is potentially jeopardising business, only four participants stated that business was being jeopardized, and these fell in the finance and business services industries. These participants reported that the SMME itself was becoming obsolete, and the solution they identified was to diversify businesses.

35% of participants stated that they are not ready for the Fourth Industrial Revolution and the changes it may bring, while 47% reported being ready and 18% were indifferent. Those who were not prepared for the challenges of business relevance, funding the Fourth Industrial Revolution through things like licencing software and other forms of technological advancement, were among those who were. Where funding was a concern, participants stated that saving revenue was the only possible way to finance new technologies.

4.5.5.1 Theme 5: What challenges does the business have regarding technological advancements?

The most frequent challenge reported by participants are finance required to purchase new technologies.

Participants 1 and 2 indicated: *"Lack of information on the topic."*

Participants 3, 4, 5 and 17 stated: *"Costs to implement."*

Participants 6 stated: *"Competition resulting in a flooded market with everyone trying to do 4IR business."*

Participants 7 stated: "*None, challenge is the countries situation."*

Participants 8 stated: *"Costs and risk around training new personnel."*

Participants 9 stated: *"Keeping up and paying for websites and marketing tools with small budget."*

Participant 10 shared similar sentiments to participant 9

4.5.5.2 Sub-Theme 5.1: Is there a concern that business will be jeopardized due technological advancements? Yes/no

5 out of the 17 participants reported that they believed business was being jeopardised by technological advancements.

Why does the company feel business is being jeopardised?

Participant 1 stated: *"Companies are cutting out the middleman as they have access to large scores of data which was retrieved by the middleman"*

Participant 2 stated: *"Company becoming obsolete"*

Participant 4 stated: *"Market is becoming smaller as more people try to harness the Fourth Industrial Revolution"*

Participant 11 stated: *"Competition with huge manufacturers when my company has basic equipment"*

Participant 15 stated: *"Platforms online that connect freelancers to clients cut out the need for my company"*

Does the company plan to work around this?

Participant 1 stated: *"Diversify and find digital solutions*

Participant 2 stated: *"Creating new, relevant solutions for business"*

Participant stated 5 stated: *"target people who do have a need for the business".*

4.5.5.3 Sub-Theme 5.2: Does the company feel ready for the changes that the Fourth Industrial Revolution will bring to the company?

35% of participants stated that they are not ready for the Fourth Industrial Revolution and the changes it may bring, while 47% reported being ready and 18% were indifferent. The following views were expressed by participants:

Participant 1, 2, 3, 4, 11 and 15 indicated: *"No."*

Participant 5, 6, 7, 8, 10, 13, 14 and 17 stated: *"Yes."*

Participant 9, 12 and 16 observed: *"Indifferent."*

Based upon the research findings, some participants raised a concern that South Africa was not ready for the Fourth Industrial Revolution. One such case is an e-commerce SMME that expressed

the desire to start manufacturing their own products but feared that the economic environment was not conducive to such progress. The participant stated,

> *I am looking to going into manufacturing my own products. A lot of it can be done with 3D printers but I look at the running costs and wonder if it will be worth it. Especially with running costs increasing due to hiking interest rates and load-shedding. There have been things I have had to urgently buy such as UPS and an inverter without budgeting because it was so urgent. So, the issue around this is the stability of the country that makes it hard for businesses to take calculated risks.*

When asked how this could be remedied, he said, *"I don't know how to tackle the issue around the publics buying power, vote differently maybe?"*.

4.5.5.4 Sub-Theme 5.3: What challenges does the company anticipate regarding Fourth Industrial Revolution?

Participants anticipated various challenges, such as a lack of economic growth resulting in the SMME remaining small and a lack of buying power as a result of the economy causing sales of non-essential products and services to dwindle, affecting business. These challenges were mostly related to the state of South Africa rather than the Fourth Industrial Revolution. However, some participants stated that one of the challenges of the Fourth Industrial Revolution is that people's needs are rapidly increasing due to technology, and businesses lack the capacity to meet these needs. Other challenges that SMMEs face include competing with other SMMEs and corporates that have access to technologies that they do not. Creating greater inequality in business. The following views were expressed by participants:

Participant 2 observed: *"Remaining an SMME and not recovering from COVID19 and ultimately being unable to catch up to the 4IR."*

Participant 9, 12 and 16 observed: *"Funding new technologies/systems and licensing."*

Participant 4 observed: *"Client's requirements will change, and the company's current capacity does not suit the requirements."*

Participant 6 observed: *"Competitors and funding new technology for competitive advantage."*

Participant 7 observed: *"People's buying power limits the company from pursuing. manufacturing becomes if the price points changes, they will lose customers, so they rather import from China."*

Participant 10 observed: *"Competing with very big Chinese wholesalers."*

Participant 11 observed: *"Funding when eventually a plant is opened."*

Participant 15 observed: *"Decline in business but not solely due to technology but also a change in the ways of work."*

4.6 Conclusion

The presentation and interpretation of the research findings discussed in this chapter were in relation to the aims and objectives of this study. The human and social capital theory was used to analyse the primary research findings. Based on the research findings, it was revealed that,

a) Automation is being utilised by SMMEs to varying degrees.

b) Automation has led to some job losses mostly of people earning anything less than R5 000-R10 000 per month and were hired in entry-level jobs. The age group varied but most fell between 20-30.

c) Most SMMEs do not have contingency plans for preventing job losses as only 35% of the participants interviewed had some form of education/upskilling programme.

d) Employability has changed as automation has simplified responsibilities in most roles reducing the need for many staff. Roles in administration and finance was the widest reported roles to be, becoming obsolete. SMMEs seek soft skills in the recruitment process but when asked which weighed more educational qualifications or skills in automation, most stated education. This however is closely linked to the attitude towards the Fourth Industrial Revolution.

e) Most SMMEs reported being ready for the Fourth Industrial Revolution while some stated they were not ready, and a small number stated they were indifferent. The challenges which most SMMEs anticipate is funding for new technologies and other changes that the revolution may bring. Some SMMEs, mostly in the Finance and

Business Services industry, reported concerns that automation will jeopardise business by causing it to become obsolete. While a similar number, mostly in the Trade and Accommodation industry, express that business has been enhanced and is thus growing rapidly through the implementation of Fourth Industrial Revolution biproducts such as e-commerce. Thus, it cannot be said definitively if the revolution is having a negative or positive effect as it has benefits and challenges to different SMMEs. However, the country's current economic situation has widely been expressed by participants as more dire than the Fourth Industrial Revolution.

4.7 Summary

Therefore, this chapter has presented the main findings of the study. It reflected the perceptions and experiences participants had working in SMMEs in the age of the fourth industrial revolution. The following chapter will discuss the main conclusions and recommendations.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the findings that were outlined in Chapter 4 of the study and makes recommendations from the study. The overall objective of the study was to explore the effects the fourth industrial revolution is having on SMMEs in Gauteng. The study looked at SMMEs in the manufacturing industry, finance, and business services industry, and lastly, in the trade and accommodation industry. This explorative study aimed to:

1. To determine if automation is being utilised by SMMEs.
2. To examine if automation is leading to job losses.
3. To examine if SMMEs have contingency plans to prevent job losses.
4. To examine if the standards of employability characteristics changed.
5. To identify whether the fourth industrial revolution is having a negative or positive effect on in employment in SMMEs.

5.2 Findings from the Study

This section of the study provides the main conclusions of the research study per objective. The major findings of the study with that given South Africa's Levels of inequality, poverty, and unemployment. The impact of the Fourth Industrial Revolution will be no more negative than positive. This impact will be exacerbated by South Africa's lack of digital literacy among the group termed the digi-deprived. Those that are digitally illiterate are among the majority of participants in the Small to Medium and Micro Enterprises in South Africa. Additionally, this is the same cohort that does not have digital literacy; hence they are not re-skillable or up skillable and will obviously be impacted, especially by automation.

5.2.1 Research Objective One

This objective sought to determine if SMMEs were utilising automation. The research found that most SMMEs utilised some form of automation, with most reporting that administrative and bookkeeping functions of the business had been automated. The findings on this objective confirmed what was contained in literature and also affirmed by Key Informant Respondents. The key finding was that SMMEs were struggling to cope up with the sudden and immediate COVID-

19 pandemic-imposed transition from doing their business ‘as usual’ to dealing mainly online. Where automation was a solution and on alternative, the challenge was that the money to acquire their technology and machinery was not available. Additionally, the skills to operate the acquired machines was not also available. Thirdly, transitioning current staff from business ‘as usual’ to automation and online business proved to be difficult as most of the staff were untrainable and lacked the foundational digital literacy needed to be trained in order to operate automatic machines and wake online.

Most participants (75 per cent) reported that they have adopted new ways of working, such as virtual meetings and paperless systems. with the COVID-19 pandemic and lockdown, which required businesses to adapt traditional office working spaces to individual working from home spaces. Thus, it is undeniable that this has triggered the shift from traditional ways of working to new ways of working that embrace the technological advancements of the fourth industrial revolution, such as virtual meetings, for instance. Therefore, it can be deduced that SMMEs are utilising forms of automation in office functions; however, it cannot be said that this is solely because of the fourth industrial revolution penetrating society but rather that the fourth industrial revolution and automation are being established as a result of the COVID-19 pandemic.

Although most SMMEs reported automating simple functions such as administration and bookkeeping (office functions), others reported that they had automated core business functions such as closing physical trade stores to open e-commerce stores. Others reported using e-commerce platforms such as UberEats and AirBnb. Thus, SMMEs in the trade and accommodation industries displayed a more significant use of automation. SMMEs in the manufacturing industry mostly automated the typical office functions; this was because these manufacturers made small quantities of products and, thus, did not have advanced, automated equipment. Thus, it can be deduced that SMMEs in the manufacturing industry have implemented little to no automation in manufacturing plants due to the scale at which they manufacture products. In finance and business services, it was reported that office functions were automated, with some core functions being automated.

The study then tried to determine the attitude of participants towards the fourth industrial revolution to identify if automation is indeed being entrenched in SMMEs. The study found that participants from the trade and accommodation industries were the most positive towards the fourth industrial revolution, and this is attributed to these SMMEs feeling secure in their business prospects. Participants in the manufacturing industry were mostly indifferent or felt negatively about the fourth industrial revolution, as they feared that they would be unable to compete with large-scale manufacturers with advanced manufacturing plants. Some people in the finance and business services industries even went so far as to say that the changes of the fourth industrial revolution threatened their businesses.

Chapter two of the study discusses the concern that developing countries will lag behind developed countries, especially countries such as China that have made huge strides in the fourth industrial revolution. Recolonisation, according to the literature, will occur when least-developed countries become technologically dependent on developed countries. Through this objective, it is found that SMMEs have implemented forms of automation, but not to a significant extent, especially in comparison to some of the other BRICS states. This study cannot prove that South Africa will become dependent on developed countries, but it does show that the country is slow to adopt new technologies, which could be a problem in the long run.

5.2.2 Research Objective Two

This objective sought to examine if automation was causing job losses in SMMEs. Given the unavoidability of automation in the SMMEs sector, this sector was confronted with a situation where they had to make a choice. Given that most of the staff lacked the foundational digital literacy, most SMMEs had to survive by outsourcing these automated and digitalised functions to specialised industries which sprouted up and taking advantage of this new sector. Outsourcing therefore consisted an overt form of job losses as work that was supposed to be done in company was now being accomplished and done by outsourced companies. This finding was consistent with both literature review and the views of key informants, who noted that unless they are concerted efforts to recruit staff that have got the requisite digital literacy. Those already working in the lack this skill will find themselves unemployed as most of the week. Becomes automated and subsequently outsourced. An additional danger with this development is that once an SMME

becomes comfortable with outsourcing and they begin to enjoy most of its advantages, they will reduce the size of their staff and begin to remodel their businesses around, outsourcing most of their functions.

Form the data collected, it was revealed that an overwhelming majority of participants stated that automation was not leading to job losses within their SMME. It was found that SMMEs outsourced many services to other SMMEs or freelance professionals. For instance, some participants reported that they did not have a full-time accountant but contracted an accountant on a project basis. This proved true across all three industries that this study considered. As a result, because SMMEs outsource human resources, they limit their staff complement to essential personnel. This is a contributing factor to why there have been few to no job losses in relation to automation.

Participants believed, however, that automation was affecting employment in their respective industries. It is reported that automation reduces the day-to-day responsibilities and makes most jobs a lot easier and less time-consuming, and therefore, fewer staff are required per department. Despite responsibilities in roles being reduced and the staff complement being reduced, roles were not becoming fully automated. In the trade and accommodation industries, the reduction of staff was less prevalent, as participants believed that hyper-consumerism and accessibility through e-commerce platforms were expanding business and even creating employment.

Where job losses were reported, it was found that people in entry-level roles lost employment. These people earned between R5 000 and R10 000 per month and were between 20 and 30 years old. Despite the reported low level of job losses because of the fourth industrial revolution, the NDP and SDGs 2030, which aim to significantly increase employment through economic growth, will not be realised by 2030 as planned.

Professor Mthunzi Mdwaba, a serial entrepreneur and, inter alia, Chairperson of Productivity SA and former Vice-President of the International Organisation of Employers (“IOE”), the largest private sector business organisation in the world, with over 150 members, representing over 50 billion companies and who was also the Vice-Chairman of the International Labour Organization (ILO”) the only tripartite special agency of the United Nations (“UN”), was interviewed as an

expert in the field of this study. Professor Mdwaba stated that the job losses in the SMME sector due to the fourth industrial revolution are expected to be low. This is because the use of automation and artificial intelligence in the means of production is likely to be low. The fourth industrial revolution hasn't reached other parts of the country. Large corporations are more likely to be the first to lay off workers when an economic downturn is detected. SMMEs show more resilience in this regard. He stressed though that the low levels of disruption could only be achieved by an early intervention in the up-skilling and re-skilling of people so they can be re-directed from roles and jobs that would reduce their absorption in sectors that are being eroded into those that would have increased absorption. Failure to do this, would over time then confirm the self-fulfilling prophecies of doom and gloom. Generally, technology, he argued had done the opposite over time, and had proved very instrumental in the creation of jobs throughout the different kinds of revolutions.

However, Professor Mdwaba states that this does not mean that the NDP and SDGs will be realised by 2030. When COVID-19 hit, money had to be redirected to ensure that people had clean water, PCR tests that were being used, and other such medical emergency necessities. which alone has thrown the goals off course. Prior to COVID-19, however, it would have taken approximately $100 trillion to achieve the SDGs in Africa.

Professor Mdwaba stated that there are 700,000 unemployed people in the UIF database. 80% are on unemployment benefits. The people receiving unemployment benefits are separate from the Department of Labour and Employment database, which already has six million unemployed people. Eradicating anything is impossible with high levels of unemployment and economic inactivity. Therefore, the NDP was an incredibly ambitious document that would have been difficult to realize, especially as it did not foreshadow COVID-19 or the energy crisis. Our high levels of implementation failure as a country tend to sabotage the good policies we have adopted.

5.2.3 Research Objective Three

This objective examined whether SMMEs had contingency plans to prevent job losses in the form of educational initiatives or up-skilling programmes. Only 35% of participants reported having an up-skilling programme implemented at their SMME. These programmes ranged from free

programmes that were provided as part of the membership benefit from Microsoft to health and safety training and up-skilling on how to use new equipment.

Despite the low number of SMMEs implementing an up-skilling programme, 70% of the participants believed it was the only way to prevent job losses due to automation. Out of the 65% of participants that had no up-skilling programmes offered, exactly half of the SMMEs stated that some form of programme would be implemented when there were additional employees. while the other half stated that no up-skilling programme would be introduced as experience was deemed sufficient and the exercise would be too costly.

Therefore, most SMMEs do not have contingency plans to prevent job losses due to automation, as most do not have any educational or up-skilling programmes. Half of those who did not have any educational or up-skilling programmes intended to create such programmes as the business grew and the staff complement increased. It was also expressed that the growth and survival of the business, amidst the hardships faced due to the crippling economy and load shedding, are essential to retaining jobs above up-skilling.

According to the human capital theory, which guides this study, investments in humans will lead them to be more productive, which ultimately results in higher individual value and a positive contribution to the economy at large. Investing in humans includes up-skilling them. The study found that SMMEs are not investing in up-skilling employees, and therefore, we can expect a lack of economic activity to result. The SMMEs that planned to implement programmes mostly stated that upon hiring a larger staff, they would introduce programmes. However, according to this theory, by up-skilling the people that they do have, it would result in increased economic productivity and growth in the business, which would lead to an expansion in the staff complement.

Professor Mdwaba stated that COVID-19 has blurred the lines in terms of how to move forward in ensuring that the future of work is inclusive. Before COVID-19, there should have been interventions such as re-skilling, up-skilling, coaching, and mentoring to get people work-ready for the future of the Fourth Industrial Revolution paradigm. The only thing that will obviate the challenges of the fourth industrial revolution is up-skilling. The only way to manage the transition

and get people to cross into different platforms, with dignity is skilling people on a continuous and consistent basis.

SMMEs have difficulty accessing funds to up-skill and even to invest in and implement new technologies. The current government claims to be a development state, and the policies are created within that paradigm, but expecting private sector funding for SMMEs is a pipe dream. The role of the private sector is not to fund companies; they have their own issues, such as COVID and energy. Companies are also pro-profit and pro-growth for themselves. They are not all pro-development. Professor Mdwaba stressed that, a development state goes into the social and economic fabric of society and participates in building people and enterprises so that people have dignity, resilience, and sustainability. Therefore, the government must lead by example and be the funder of first resort. In leading by example, the private sector will feel encouraged to partner with the state. It is the role of the state to develop its people and its enterprises. This needs to be a priority for SMMEs to have access to funds.

5.2.4 Research Objective Four

Research objective four sought to determine if the standards of employability have changed to accommodate the fourth industrial revolution. This objective sought to find out if there was a change in the nature of the work which staff in the SMME undertook prior to the Fourth Industrial Revolution and after. This is on the back of the fact, reported in literature, that the Fourth Industrial Revolution fundamentally changed most, if not all, facets of life. Hence it was. Presented is the greatest disruptor of all time. Literature also reported incidences of job losses as a result of Fourth Industrial Revolution-induced redundant. In some SMMEs this redundant created acrimony between management and stuff, where staff blamed management for deliberately rendering them redundant by buying machines which was aimed at replacing them.

The study was found that most (70%) of the participants believed that day-to-day responsibilities had changed, as responsibilities have been simplified by automation. It was found that roles were not becoming completely obsolete, even those that were earlier reported to be heavily automated, such as administration and finance. Such roles have a smaller staff complement, but the roles and departments themselves are not becoming completely obsolete.

A small number of participants did report that they believed roles were becoming obsolete, and it was found that these participants also reported job losses in the roles that they believed were becoming obsolete. The participants expressed that those functions, such as payroll, are automated via most banking applications. Other tools, such as Sage, allow businesses to keep track of financial matters such as invoices and purchase orders. However, even so, such roles have been reduced from a full-time to a "free-lance" sort of role.

It was found that desirable employability characteristics when recruiting new staff are soft skills such as discipline, resilience, professionalism, willingness to learn, creativity, and adaptability. Tertiary educational attainment is still desired, as participants stated that this made candidates more trustworthy to be able to perform the job and that they are more likely to have learned the desirable soft skills through studying.

It was discovered that SMMEs rely on the founder to lead the company in meeting its needs by teaching employees what needs to be done. Furthermore, SMMEs have tight budgets and thus do not seek to hire qualified staff to perform one role but rather someone who does not necessarily have tertiary qualifications as their cost to the company is usually lower and they are more willing to perform multiple roles.

Where participants stated that education was prioritised over skills in automation, it was often people who felt negatively about the fourth industrial revolution. Then, where it was reported that skills in automation are prioritised, it was expressed by participants who felt positively about the fourth industrial revolution and looked to "champion the revolution." Thus, the priority of educational attainment over skills in automation is closely related to the SMME's attitude towards the fourth industrial revolution. Emerging skills that participants described as desirable are marketing within digital platforms as well as content creation for social media marketing. This was associated with a sales-oriented mindset, which was described as desirable.

According to Professor Mdwaba, the skills coming out of institutions and the skills required by employers were not aligned. Skills mismatches that were already prevalent pre-covid, were now becoming more and more wide spread due to the time we have lost during the covid.There was some questioning about whether STEM should still be the main focus or if the skills of the future are ones that cannot be emulated by robotics, together with an up-ramping of vocational skills.

Skills such as law and accounting can be done by robots. But there was a big move towards skills that are creative, require emotional intelligence, communication, and marketing. However, as with vocational training, there is still a lot of stigma attached to it because it is associated with apartheid structures. In European countries, Germany being an example with its two-tier system, there is no status orientation around these things, as people have the same social standing in a formal career and a vocational career. Therefore, there is a skills backlog that is highly prevalent in South Africa, and this shows how employability characteristics are changing and are misaligned.

5.2.5 Research Objective Five

Research objective five aimed to identify whether the fourth industrial revolution is impacting SMMEs negatively or positively. This objective aimed to measure and assess the impact of the Fourth Industrial Revolution on SA as SMMEs, given the levels of digital illiteracy some of the staff were not even aware of the existence of the fourth Industrial Revolution in their workplaces, never mind the fact that their jobs could be threatened by these developments. This objective also sought to assess the readiness of employees in the SMME sector to embrace and take advantage of automation as the fourth industrial revolution consolidates. Unfortunately, what was found out was mostly resistance in suspicion by staff. This view, that automation is a threat than a problem solver was also enhanced by labour unions, which are opposed to the mass replacement of human beings by machines. Especially in the coal mining industries of South Africa. 35% of participants stated that they are not ready for the fourth industrial revolution and the changes it may bring, while 47% reported being ready and 18% were indifferent.

Half of the participants stated that they did not have any challenges, and this correlated with the participants who reported their businesses being advanced by the fourth industrial revolution, and this occurred most frequently in the trade and accommodation industries. It further correlates with participants who had positive attitudes towards the fourth industrial revolution.

It was found that some SMMEs stated that their businesses were jeopardized, and these were in the finance and business services industries. These participants reported that the SMME itself was becoming obsolete, and the solution they identified was to diversify businesses. All SMMEs expressed that one challenge around automation was the costs involved in implementing new

technologies. Where funding was a concern, participants stated that saving revenue was the only possible way to finance new technologies. Self-financing was the only answer, as SMMEs stated that funding would result in the price point of their products and services increasing, which consumers, in the state of the economy, would be unable to afford.

Other challenges that SMMEs face include competing with other SMMEs and corporates that have access to technologies that they do not. Creating inequality in business based upon the research findings, most participants raised a concern that South Africa was not ready for the fourth industrial revolution. One such case is an e-commerce SMME that expressed the desire to start manufacturing their own products but feared that the economic environment was not conducive to such progress, citing load shedding and hiking interest rates as huge worries. And furthermore, a lack of buying power as a result of the economy is causing sales of non-essential products and services to dwindle, affecting business. Thus, businesses are weary of investing in growth ventures as they fear they will not have a return on investment. This stagnates innovation in various industries.

5.3 Recommendations

5.3.1. This study found that most SMMEs had no up-skilling programmes, this was leading to redundancy. A lack of knowledge affects SMMEs and thus they are not informed on measures to upskill employees. Government should thus intervene on the ground as it has many policies and task teams but there is no turnover.

5.3.2. This study found that desirable employability characteristics are literate job seekers that are able to adapt to ever changing environments. To achieve literacy, digital skills need to be imparted to job seeks which requires government intervention in schools and post-school programmes.

5.3.3. Since knowledge and capabilities in communication technologies are becoming more widespread, while at the same time, students should learn social science subjects because understanding society will continue to be important because machines are unable to carry out jobs that require a human touch, such as psychology.

5.3.4. This study found that the uptake of the fourth industrial revolution has been incremental but not necessarily sufficient. Thus, the use of the fourth industrial revolution innovation should be incremental and include traditional and automated methods of production.

5.4 Areas of Further Research

Due to the scale of the study, it only considered three of the ten SMME industries. namely, (1) manufacturing, (2) trade and accommodation, and (3) finance and business services. These industries have the highest annual turnover. Further areas of research would be expanding this research to include: (4) agriculture; (5) mining; (6) electricity, gas, and water; (7) construction; (8) transport and communication; (9) community; and (10) other. Furthermore, the study does not look at SMMEs, which fall into the informal sector. These constitute a great number of jobs created, which ultimately contribute to improved livelihoods, and should be considered in further study to examine the effects the fourth industrial revolution is having on this part of the sector and to determine if similar findings are found elsewhere..

5.5 Conclusion

As a result, this chapter has discussed the findings from Chapter 4 in relation to the literature review, the human capital and social capital theories, the guiding policy - the National Development Plan (NDP) and the Sustainable Development Goals (SDG), and an interview with an expert on the topic of the study. The chapter made recommendations as per each research objective and, lastly, highlighted key areas for further study.

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APPENDICES

APPENDIX 1: PERMISSION LETTER

University of Cape Town

Department of Social Development

Permission Letter

The researcher, **Gabriella Jacobs**, is completing her Master of Social Science in the Department of Social Development at the University of Cape Town. The researcher seeks your permission to be interviewed as a participant for the study.

Research Title: An Explorative Study on the Effects of The Fourth Industrial Revolution on Employment in Small, Medium and Micro Enterprises

Research Objectives:

I. To determine if automation is being utilised by SMMEs.
II. To examine if automation is leading to job losses.
III. To examine if SMMEs have contingency plans to prevent job losses.
IV. To examine if the standards of employability characteristics changed.

V. To identify whether the Fourth Industrial Revolution is having a negative or positive effect on in employment in SMMEs.

Required Characteristics of Participants:

I. The participants must be over 18 years of age as this is the legal age of consent in South Africa
II. Work in a SMME between 2017-2022, this allows the participant to reflect on change in employment in the last five years.
III. Greater than five people employed, this allows the participant to reflect on how different roles have changed over the last five years.

Research Supervisor: Dr. Chance Chagunda

Disclaimer:

- The interview will be approximately 20 minutes and happen over a secure, end-to-end encrypted platform Zoom or MS Teams.
- The researcher humbly requests that you secure your own data/access to wi-fi for the online interview.
- The interview will be recorded, and transcripts will be created. The researcher, research supervisor and examiners will have access to this. This will be destroyed following the study being graded and published. The researcher ensures you that you will be anonymised in the interview and all identifiable characteristics will be coded i.e.: referring to you as Participant 1 /Participant 2 etc.

Should you meet the required characteristics, and you give permission to be interviewed, please sign the consent form attached to the email. The consent form will be kept for a period of five years, as per UCTs policy. The consent form will be kept in secure.

APPENDIX 2: INFORMED CONSENT FORM

University of Cape Town

Department of Social Development

Consent Form

TITLE OF PROJECT:

An Explorative Study on the Effects of The Fourth Industrial Revolution on Employment in Small, Medium and Micro Enterprises

NAME OF PRINCIPAL RESEARCHER(S):

Gabriella Jacobs

TELEPHONE AND EMAIL:

061-434-7100 / JCBGAB003@myuct.ac.za

PARTICIPANT'S INVOLVEMENT:

- I agree to participate in this project.
- I have read the permission letter and had the opportunity to ask questions about the study.
- I agree to these results being used for education and research on condition my privacy is respected.
- I understand that I am under no obligation to take part in this project and that a decision not to participate.
- I understand I have the right to withdraw from this project at any stage or during the interview with no ramifications to myself.
- I understand that I am required to secure my own data/wi-fi access for the interview and will not be paid or compensated by the researcher or UCT for my participation.
- I agree for the interview to be recorded and transcripts created. The researcher, research supervisor and examiners will have access to this. This will be destroyed following the study being graded and published. The researcher ensures that I will be anonymised in the research report and all identifiable characteristics will be coded.
- I understand that this consent form will be kept for a period of five years, as per UCTs policy. The consent form will be kept in secure storage on UCT property.

Name and signature of person who sought consent:

Name and signature of the participant who gives consent:

APPENDIX 3: SEMI-STRUCTURED INTERVIEW SCHEDULE

University of Cape Town

Department of Social Development

Semi-structured Interview Schedule

An Explorative Study on the Effects of The Fourth Industrial Revolution on Employment in Small, Medium and Micro Enterprises

Semi- structured Interview Guide

Introduction

My name is **Gabriella Jacobs** am conducting research on **effects of the Fourth Industrial Revolution on employment in SMME businesses.**

Notes:

- Discussion on ethical considerations: voluntary participation; audio recording of the interview; anonymity; confidentiality.
- Clarification on that there are no 'right' or 'wrong' responses.

Demographic Information

1. How old are you?

20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65+

2. Which gender do you identify as at the company?

Female/Male/Other

3. What population group do you fall under at the company?

Black/White/Coloured/Indian/Asian/Other

Employment Information

1. What is your role in the company?
2. How long have you been at the company?

Company Characteristics

1. What industry does the company fall into?
2. How long has the company been in operation?
3. What is the staff compliment?
4. What is the estimated annual revenue of the company?

Company's Future of work

Objective one: determine if automation is being utilised by SMMEs.

1. In the last five years, has the company automated any functions?
2. What forms of AI/automation has the company implemented?
3. What is the company's attitude towards the Fourth Industrial Revolution?

Objective two: examine if automation is leading to job losses.

1. In the last five years, have people lost their job due to the role being filled by some form of automation Yes/No
   1.1. If yes, what role (s)
   1.2. How many people have lost their job.
   1.3. What were the characteristics of those who lost their job?
   Age: 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65+

   Wage: <R5000; R5000-R10 000; R10 000- R15 000; R15 000-R20 000; R20 000-R25 000; R25 000-R30 000; R30 000-R35 000; R40 000-R45 000; R50 000 +

   Education attainment: < Less matric; Matric; some tertiary; tertiary qualification; some post-graduate; post-graduate qualification

   1.4. What category would that role fall into?
   Entry-level/ Mid-level/ Senior, Manager/ Director/Executive, or a contract role
2. Do you feel that technology, automation is affecting employment in your company?
3. Do you feel that technology, automation is affecting employment in your industry?

Objective three: examine if SMMEs have contingency plans to prevent job losses.

1. Does the company have any educational/upskill programmes? Yes/No
   1.1. If so, what programmes?
   1.2 If no, Does the company intend on creating any educational/upskill programmes?
2. Do you think there are other ways to prevent job losses in your business?

Objective four: examine if the standards of employability characteristics changed.

1. Have any responsibilities changed within roles due to automation?
2. Does the company foresee certain roles becoming obsolete?
   2.1. If so which roles and why?
3. What skills does the company look for during the recruitment process?
   3.1. Did you previously require these skills?

4. What emphasis does the company place on education vs. skills in automation?

Objective five: identify whether the Fourth Industrial Revolution is having a negative or positive effect on in employment in SMMEs.

1. What challenges does the business have regarding technological advancements?
2. Is there a concern that business will be jeopardized due technological advancements? Yes/no
   2.1.If yes, what?
   2.2. Does the company plan to work around this?
3. Does the company feel ready for the changes that the Fourth Industrial Revolution will bring to the company?
4. What challenges does the company anticipate regarding Fourth Industrial Revolution?
5. How does the company plan to tackle future challenges?

Debriefing

1. How do you feel following the interview?
2. Do you feel that the questions asked to have triggered any emotional response that requires assistance?