

**THE IMPACT OF THE FOURTH INDUSTRIAL REVOLUTION ON THE  
PERFORMANCE OF SMALL AND MICRO ENTERPRISES: A CASE OF  
MANKWENG TOWNSHIP, POLOKWANE LOCAL MUNICIPALITY, SOUTH AFRICA**

by

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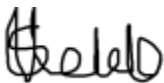
**UNIVERSITY OF LIMPOPO**

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**2023**

## Declaration

I declare that “**The Impact of the Fourth Industrial Revolution on the Performance of the Small and Micro Enterprises: A Case of Mankweng Township, Polokwane Local Municipality, South Africa**” submitted in fulfilment of the requirements for the degree Master of Development Studies in Planning and Management at the Department of Development Planning & Management, School of Economics & Management, Faculty of Management and Law has not been submitted before by me to this university or any other institution, that this is my own work and that all the information used in the study has been duly acknowledged as such.



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**Signature**

**SELELO M.E (MR)**

**DATE**

**2023**

## Acknowledgments

It is a great pleasure to recognize and acknowledge a few individuals who have given me the strength and hope to undertake and complete this dissertation. First and foremost, I would like to thank my **God** for wisdom, strength, hope, and guidance during the process of the study. Through **God** everything is possible.

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## Dedication

I vehemently wish to dedicate the dissertation to my mother who never witnessed my academic journey and may her soul continue to rest well. She remains the pillar of my strength. I also want to dedicate this dissertation to my grandparents **Mamolatelo and David Selaelo** (late) and all my aunts, brothers, sisters, and uncles.

## **Abstract**

The Small and Micro Enterprises (SMEs) are mostly viewed as the catalysts of development in both developed and developing countries. Their significant contribution to socio-economic development has captured the attention of governments across the world. Hence, most governments rely on SMEs to uplift and spearhead their local economy. They also assist the governments to meet or at least fulfil some of the national imperatives. The SMEs in South Africa are mostly located in townships and largely in rural areas and are very accessible to the people on the ground. However, SMEs have currently met the unprecedented growth of technology which is the Fourth Industrial Revolution (4IR). The growth of the 4IR influences SMEs to change their traditional way of conducting business operations to be compatible with the changing technology. Meanwhile, the 4IR refers to the usage of the Artificial Intelligence (AI), the Internet of Things (IoT), digitalization, robotics, Cyber-Physical Systems (CPS), and nanotechnology amongst others. This study discusses both variables in length to answer the research questions. Therefore, this study investigated the impact of the 4IR on the performance of SMEs. The study used judgemental sampling to sample the owners of SMEs to solicit their perceptions on the subject under investigation and as such, open-closed-ended questionnaires were administered to them. It sampled 50 SMEs around Mankweng Township which was sufficient to draw relevant conclusions. The study used a thematic analysis to analyse qualitative data and adopted Statistical Package for Social Science (SPSS) and Microsoft excel to analyse quantitative data collected from the participants. This study reveals that SMEs are underperforming with a decline in customers and loss of sales as a result of poor financial resources and poor state of technology. The study recommends that stakeholders such as individuals, the private sector and the government come on board and actively provide more concerted efforts and resources to aid SMEs.

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## **Acronyms**

SMEs	: Small and Micro Enterprises
BDO	: Business Development Officer
4IR	: Fourth Industrial Revolution
AI	: Artificial Intelligence
ICT	: Information and Communication Technology
M2M	: Machine to Machine
CPS	: Cyber-Physical Systems
IoT	: Internet of Things
IoS	: Internet of Service
LED	: Local Economic Development
SEDA	: Small Enterprise Development Agency
SEFA	: Small Enterprise Financial Agency
NYDA	: National Youth Development Agency
DSBD	: Department of Small Business Development
WEF	: World Economic Forum
LDC	: Less Developed Countries
SETA	: Sector Education and Training Authority
SALGA	: South African Local Government Association
LIBSA	: Limpopo Business Support Agency (LIBSA)
NYC	: National Youth Commission
GDP	: Gross Domestic Product
NDP	: National Development Plan

SMEDAN : Small and Medium Enterprises Development Agency of Nigeria

KET : Key Enabling Technology

WTO : World Trade Organization

OECD : Organization for Economic Cooperation and Development

USA : United States of America



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## **Chapter 1: INTRODUCTION AND BACKGROUND OF THE STUDY**

### **1.1. Introduction and Background**

Over the past centuries, the world has experienced a radical technological revolution leading to massive technological developments. At the current juncture, the Fourth Industrial Revolution (4IR) is dominant in the space of the business environment. The 4IR is associated with the Internet of Things (IoT), more digital, 3-D printing, Artificial Intelligence (AI) and robotics (Schwab, 2016). The 4IR is an advanced phase of technological innovations that come with pros and cons in the business sector. Therefore, there is a relationship between the 4IR and performance of Small and Micro Enterprises (SMEs). Such a relationship relates to how technology is being used in the business environment that includes SMEs such as hair salons, car washes, panel beaters, shoe repairs, internet cafés, and spaza shops amongst others. Equally, the inception of the 4IR would negatively affect the *modus operandi* of SMEs. SMEs are a segment of the business environment that is known to be a tool for improving living standards (Maloka, 2013). The nature of SMEs is concerned with the reduction of social ills, creating employment and alleviating poverty among others (Meso and Manamela, 2015).

There are different transitions in which technological revolutions took place affecting the operations of businesses amongst others, particularly in the realm of SMEs. Therefore, Thuc, (2017: 13) and Dimitrieska, Stankovska, and Efremova, (2018: 182) record that the first industrial revolution took place between the periods of 1760s to 1800s. Consistent with the latter dictum, the period experienced the development of mechanization, wind, water and steam power. The construction of railroads and the discovery of steam engines were in the realm of the first industrial revolution (Hirschi, 2018; Fomunyam, 2019). The second industrial revolution in the 1820s experienced the development of mass production, assembly line, and electricity supply (Dimitrieska et al., 2018: 182). Moreover, the third industrial revolution saw the massive utilization of computers or computer revolution in the 1900s (Schwab, 2016; Thuc, 2017; Fomunyam, 2019). Of great concern is that the 4IR has a negative impact on the performance of SMEs (Schwab, 2016; Guoping, Yun & Aizhi, 2017). Thus, the performance of SMEs as far as technology is

concerned would be poor/decreased because of a lack of adequate resources. That ultimately lead to decreased profits, decreased or loss of customers, bears exorbitant cost of technology. Internationally, SMEs are known to be the champions and the root of economic growth and development (Mutula & Van Brakel, 2006).

The SMEs in Nigeria are the most important segment of the country's economy and create approximately 70% of employment opportunities (Gumel, 2019). Meanwhile, Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) (2013) reports that SMEs employ more than 59 million people which accounts for 82% of the labour force. Not circumventing the efficacy of SMEs in the economy, Mutoko (2014) establishes that SMEs globally face almost common challenges, particularly financial and shortage of skills. Hence, the new technological developments emanating from the 4IR are likely going to cripple the sustainability of SMEs in terms of cost, resources, skills, and knowledge. Meanwhile, Yoshino and Taghizadeh-Hesary (2016) indicate that the primacy of SMEs in Indonesia is employment opportunities, with 59.1% contribution to the nominal Gross Domestic Product (GDP) in the country. Meanwhile, Mutula and Van Brakel, (2006) further indicate that SMEs are significant for the growth and innovation of dynamic economies. The same sentiment is shared by Okongwu, (2001) who asserts that the sole aim of SMEs is economic growth and private partnership in both first and third-world countries. Ortmans (2012) and World Trade Organization (2012) give statistical evidence that SMEs in Brazil account for 96% of job creation in the country. Through job creation, poverty becomes history for many people and to a larger extent, it becomes controllable in different countries through the instigation of SMEs. South Africa also does not want to be left out of the equation of the 4IR (Xing & Marwala, 2017).

Xing and Marwala (2017) bring forward an argument that SMEs in the current juncture of the 4IR is exciting, which brings about complex, dialectical, and presents opportunities that could transform society for the better in South Africa. Halverson and Collins (2009: 8) also note that new technology provides radical opportunities and a lot of significant challenges to SMEs in South Africa. Moos and Sambo (2018), allude that SMEs account for 36% of the total GDP in South Africa. Meanwhile, Vuba (2019) indicates that SMEs

would contribute 60-80% to the GDP as envisioned by the National Development Plan (NDP) in South Africa. Similarly, the South African government has highlighted the significance of SMEs in innovation, employment creation, and competitiveness and that 90% of employment would be generated from SMEs by 2030 (Bhorat, Asmal, Lilenstein & Van Der Zee, 2018). The SMEs are business segments that are in proximity to the local people.

Mankweng Township is characterized by the prevalence and the proliferation of SMEs, particularly those that fall under the informal sector to uplift the business acumen in the area (Maloka, 2013). SMEs in Mankweng Township are low-tech with poor components of technology and have inadequate resources to maintain the 4IR (Maloka, 2013). Subsequently, the inception of the 4IR would provide a lot of benefits and challenges concurrently to the performance of SMEs in Mankweng Township. The purpose of the study is to uncover the impacts of the 4IR on the performance of SMEs. Alongside this background, the study argues that the instigation of the 4IR has an impact on the performance of SMEs. Such an impact would be negative because of the innumerable challenges encountered by SMEs.

## **1.2. Statement of the Research Problem**

The cost of technology (4IR) has a significant impact on the SMEs due to their poor state of resources. In that, the persistence of inadequate resources within the SMEs is one of the predicaments to SMEs to keep up with the growing technology in most of the South African Townships (Afolayan, 2014:39). Their well-known poor state of resources (financial, infrastructure and human) has hindered most of the SMEs to be compatible with the changing trends of technology in South African Townships, particularly in Limpopo Province (Maloka, 2013; Meso & Manamela, 2015; Ramohale, 2015). Hence, SMEs are not adequately technologically advanced compared to big businesses. The future, performance, and sustainability of SMEs in the current space of massive technology are not certain. SMEs are renowned for their nature of employment creation and the reduction of income poverty in different sectors of the economy in Limpopo Province (Meso & Manamela, 2015). In the case of India, SMEs are a feasible growing

sector, creating a significant portion of employment opportunities (Melanie, 2017). Despite that assertion, the development of technology has seen SMEs facing challenges in terms of technological change with the introduction of the 4IR. With that being said, the elements of the 4IR such as the Internet of Things (IoT), robotics, and Artificial Intelligence (AI) to name a few, pose a threat to the sustainability of SMEs in India (Melanie, 2017). Wisskirchen, Biacabe, Bormann, Muntz, Niehaus, Soler, and Von Brauchitsch (2017: 16) and Hirschi (2018: 193) predict that 47% of employment is at risk in the United States of America (USA) due to technological change/developments. However, the problem is the cost that comes with the inception of the 4IR which is likely to be exorbitant to the operations and performance of SMEs in the 21<sup>st</sup> century. Hence, SMEs continue to endure financial obstacles, poor marketing, and lack of infrastructure in Mankweng Township.

The majority of SMEs in Mankweng Township are in the informal sector such as shoe repairing, selling of food or catering, panel-beating, car-hiring, car wash, sewing, gardening, bakery, cleaning services, medical services, brick-manufacturing, hair salons and internet cafés to name a few. Therefore, the impact of the 4IR to such SMEs is that they experience a decline in customers, loss of profit, decreased performance and decreased savings. This study seeks to investigate the impact of the 4IR on the performance of the SMEs. With that background, the study argues that the inception and adoption of the 4IR has an impact on the performance of the SMEs.

### **1.3. Research Questions**

The general research question of the study was: How does the 4IR impact on the performance of SMEs? The specific research questions formulated from the general research question were as follows:

- What are the challenges and benefits of the 4IR?
- What are the types and characteristics of SMEs?
- What is the impact of the 4IR on the performance of SMEs?

#### **1.4. Research Aim and Objectives**

The study aimed to probe the impact of the 4IR on the performance of SMEs. Objectives drawn from the research aim were as follows:

- To analyse the challenges and benefits of the 4IR
- To explore the types and characteristics of SMEs
- To assess the impacts of the 4IR on the performance of SMEs
- To establish the appropriate measures and mechanisms to improve SMEs

#### **1.5. Definition of Concepts**

This section defines the key concepts that are used frequently in the study.

##### **➤ Fourth Industrial Revolution (4IR)**

The 4IR is the process of mechanization and an enhancement of technology in terms of physical and software components (Rojewski & Hill, 2017). According to Schwab (2016), the 4IR refers to a driven technological advancement such as additive manufacturing, automation, more digital, and the industrial internet. Meanwhile, Penprase (2018: 215) describes the 4IR as “the outcomes of the integration and compounding effects of different exponential technologies such as Artificial Intelligence (AI), biotechnologies, and nanomaterials”. Similarly, Morrar, Arman and Mousa (2017:3) define the 4IR as “a collection of terms utilized for technologies along with Cyber-Physical Systems (CPS), Internet of Things (IoT), and Internet of Services (IoS)”. Although there are different names and definitions of the 4IR, there is a common consensus on the definition of the 4IR. Equally, these definitions would assist in getting into the nitty-gritty of the phenomenon of the 4IR and elucidate its impact on the performance of SMEs.

##### **➤ Small and Micro Enterprises (SMEs)**

SMEs are the enterprises that serve as a local tool to help people to ameliorate their socio-economic hardships and enhance their livelihoods through entrepreneurship and starting up of new businesses (Ramohale, 2015). Bhorat, et al (2018) categorize SMEs in their categories and their size being, Small (5-9) and Micro (1-4). Meanwhile, Hall (2018) views SMEs as per their size, small employs fewer than 50 employees while micro

employs fewer than 10 employees. Mutoko (2014) describes SMEs as the backbone of most economies which are economic development, economic diversification, poverty reduction and employment creation. SEDA (2016) view SMEs as very wide-ranging businesses, that comprise of formal and informal businesses and non-VAT registered businesses that are the engine of economic development, spearheading economic growth, job creation and innovation. According to the Department of Small Business Development (2019: 1), SMEs mean “a separate and distinct business entity, together with its branches or subsidiaries, if any, including cooperative enterprises, managed by one owner or more predominantly carried on in any sector or subsector of the economy”. Therefore, the primacy of SMEs cannot be circumvented in developing countries because they serve as part of livelihood diversification for many people both in rural and township areas.

## **1.6. Research Methodology**

The purpose of this section is to discuss, analyse, clarify, elucidate and provide a justification for the methodologies to be adopted in this study. Lewis (2015) describes research design and methodology as the application of different tools, strategies and tactics to be used, as well as to operationalize and control the variance. However, the research approach chosen is an important consideration in the research design process since it affects how relevant data for research is obtained. Under this section, the study discusses the research design, description of the study area, kinds of data required, target population, sampling procedures, data collection techniques, data analysis techniques, and validity and reliability.

### **1.6.1. Research Design**

Marczyk, Dematteo, and Festinger (2017) describe research design as a logic that connects the information to be gathered and the inference to be taken to answer the research questions and objectives. Marczyk et al (2021) refer to the term "research methodology" as a broad approach to how scientific research should be conducted, rather than a specific method, as the name implies. The authors further indicate that research design refers to a set of research principles and techniques that help researchers get

accurate outcomes from research discoveries. Meanwhile, Lewis (2015) alludes that research design is a structure and plan that must be followed in scrutinizing the hypothesis of the research. Thus, to scrutinize the objectives of the research, the study used an exploratory research design to explore in greater detail, the impact of the 4IR on the performance of SMEs. The usage of exploratory research design provided flexibility for the researcher to explore the research questions to enhance the ability of the observations, acquiring of information and theorizing the research findings. Saunders, Lewis, and Thornhill (2007) state that the core steps of exploratory design are to search for literature and conduct interviews among others.

The researcher understands that the importance of the research design is to collect the relevant data for the study. Thus, this study employed a mixed method approach to fulfil the research aim and objectives. A mixed method approach entails qualitative and quantitative approaches. In that, the qualitative approach refers to the quality of the phenomena being studied, which is the impact of the 4IR on the performance of SMEs and the quantitative approach refers to the usage of statistics or numbers (Creswell, 2013; Maloka, 2013). Moreover, the mixed method approach provided in greater detail the understanding and discussions regarding the impacts experienced by SMEs in a period of advanced technological developments such as the implementation of the 4IR.

A study conducted by Pinto (2010) shows that mixed methods research has the potential to bridge the gap between postmodern criticisms of scientific research and qualitative research's rising popularity. A Mixed method research allows researchers to examine research questions, hypotheses, and theories while acknowledging human realities (Pinto, 2010). The application of the mixed method approach brings comprehension, validates the study, and answers the research questions (Creswell, 2013). Likewise, Alvesson and Deetz (2001) posit that the usage of the mixed methods approach is very effective and could aid in the eradication of weaknesses, be it qualitative or quantitative methods. Therefore, the mixed method enabled the researcher to validate answer research questions, assess and immerse the content of the literature on the impact of the 4IR on the SMEs performance.



### 1.6.2. Study Area

The study area was Mankweng Township which falls under the Polokwane Local Municipality in the Capricorn District Municipality (CDM) (Maloka, 2013). According to Ramohale (2015: 37), the area has a population of 41 298. Meanwhile, Census (2011) reports that the area has 10 303 households. The area consists of wards 25 and 26 which are located 30 km east of Polokwane City (Gwangwa, 2011; Maloka, 2013; Ramohale, 2015). Ward 25 is specifically made up of Unit B, unit C, unit D, Unit E, Unit F and Unit G areas. Whilst ward 26 consists of Unit A, and the University of Limpopo. Mankweng Township is characterized by SMEs that are in proximity to the University of Limpopo, Mankweng Hospital, Mankweng Magistrate and Paledi Mall. SMEs are deemed to be a tool for local economic development in the Mankweng Township with creation of employment opportunities and skills development, to name a few.

### 1.6.3. Kinds of Data Required

The study used secondary data (literature review), primary data (data collected from the targeted populations) and lastly observations as part of its primary data. Secondary data comprised of information from books, journals, articles, reports, and government publications among others, to extensively discuss the 4IR and its associated impacts on the performance of SMEs, locally, provincially and nationally. Primary data provided empirical evidence from the target population about the obstacles, business developments and acquired information about the recent technological innovations. The primary data incorporated among others, facts, opinions and perceptions from the targeted population. The perceptions and opinions include ideas that cannot be proven. Meanwhile, factual information can be observable or proven (Mashamaite, 2014). The study also used observation information.

Observation is part of collecting primary data through the researcher's direct interaction and observing the experience and physical situations of the environment with or without questioning the targeted population (Babbie, 1992; Maloka, 2013). Observations are divided into two parts, which are covert and overt observations. The overt observations are done with everyone knowing that they are being observed, while covert observations

are done without telling anyone that they are being observed (Maloka, 2013). The disadvantage of using overt observation is that the targeted population may change their behaviour and the environment knowing that they are being observed, which might result in fallacious (if), not truthful inferences. Meanwhile, the advantage of covert observations is that they would provide the researcher with the real and physical situations of the phenomenon being studied, which is the impact of the 4IR on the performance of SMEs. Therefore, the researcher used covert observations to get the real gist and state of SMEs as far as technological advancement is concerned and drew necessary conclusions. The researcher also employed a notebook to record such occasions, and experiences at all material times in the field and recorded the challenges of technology, the setting, and the resources of SMEs in Mankweng Township.

#### 1.6.4. Target Population

The target population can be referred to as the subjects of inquiry that the study intends to collect data from (Vogt, King & King, 2004). The target population of the study was SMEs that exist in the study area. The SMEs in this instance were different businesses ranging from general dealers, taverns, shoe repairs or makers, spaza shops, hair salons, panel beaters, vendors and mini-bus taxi operators (Maloka, 2013). Within the SMEs, the managers were selected to provide information about the current situation and impact of the 4IR on their businesses, as well as the significance and challenges encountered by the SMEs. The study also selected the Business Development Officer for SMMEs (BDO) under Local Economic Development (LED) unit in Polokwane Local Municipality who gave insights, opinions, and perceptions regarding SMEs and their state of technological developments in the municipality.

#### 1.6.5. Sampling Procedures

A sampling procedure is a crucial element that is used in scientific research to collect data. The significance of sampling ensures that the data collected is adequate to draw relevant inferences. Evidently, Malterud, Siersman, and Guassora (2016) indicate that it is not compulsory to have a large sample in research. This position was also corroborated by Baker and Edward (2012: 8) who indicate that a manageable number of interviews

would still be sufficient. The study used simple random sampling to randomly sample the nearest SMEs. Simple random sampling provided an equal chance for SMEs which were selected without bias and was easy for the researcher to undertake. There are 129 SMEs registered on the database of Polokwane Local Municipality (Tisane, 2020). The study sampled 20 SMEs around Mankweng Township which are registered on the database of Polokwane Local Municipality (Tisane, 2020). This number of SMEs was not sufficient to represent the target population of the study. Therefore, the study also sampled 30 SMEs in Mankweng Township which are not registered on the database of Polokwane Local Municipality. That brings the total sampling size of the study to 50 SMEs. Hence, a sample conjecture of 50 SMEs was considered enough for the researcher to characterize the target population and draw necessary suggestions. The study adopted non-probability purposive sampling to sample managers of SMEs. The managers in this case meant the owners of SMEs. The selection of purposive sampling ensured the ability to solicit pertinent information from the respondents about their experiences, perceptions, challenges, and knowledge of their businesses (Maloka, 2013). Judgmental non-probability sampling was used to select a BDO for SMMEs under LED unit in Polokwane Local Municipality to give a brief analysis, prospects and challenges, opinions, and facts about SMEs.

#### 1.6.6. Data Collection Methods

The study used the desktop method as one of the data collection methods to collect secondary data which involves the usage of books, journals, government publications, and reports. Primary data was gathered using a survey-based method which encompassed structured questionnaires and an interview schedule. The advantage of using a survey-based method is that it can be given to a myriad number of individuals, businesses, and households to provide their analysis, experience, and knowledge on the impact of the 4IR on the performance of SMEs (Maloka, 2013). A structured questionnaire with open-closed-ended questions was developed and administered to the managers of SMEs to answer the research questions. In that, close-ended questions stringently allowed the managers to select from the options offered in the questionnaire. Meanwhile,

open-ended questions allowed managers to have latitude to provide experiences and perceptions on how the 4IR impacts the performance of their businesses.

An interview schedule as part of collecting primary data was structured and given to the BDO for SMMEs in Polokwane Local Municipality to solicit qualitative information about the support, challenges, types, and characteristics of SMEs. The qualitative information talks about the quality of the phenomenon being studied, which is the impact of the 4IR on the performance of SMEs which was supported by the facts, perceptions, and opinions from the BDO for SMMEs under the LED unit.

#### 1.6.7. Data Analysis Techniques

The purpose of the analysis is to bring logic to the data collected (Maloka, 2013). A mixed method analysis was used in this study. In that, qualitative data analysis was scrutinised using thematic analysis. The adoption of the thematic analysis ensured that the researcher pinpoints, probes, and records the pattern themes from the information collected, getting into the nitty-gritty of the data from the questionnaires and interview schedule. Meanwhile, the quantitative data analysis was analysed using a coding procedure to provide understanding and interpretation to simplify the numerical data. Quantitative data incorporates statistics or numbers (Creswell, 2013; Maloka, 2013). Consistently, in the coding procedure, the researcher employed the Statistical Package of Social Sciences (SPSS) and Microsoft excel to analyse quantitative data. Equally, SPSS and Microsoft excel were used to produce graphs, charts, and tables to show the extent to which the 4IR impacts the performance of SMEs.

#### 1.6.8. Validity and Reliability

Mashamaite (2014) understands validity as a level at which empirical measure sufficiently shows the real meaning of the subject under investigation. Moreover, the study used a literature review to validate the study and conspicuously define the purpose of the study. To maintain validity and reliability, the study conducted piloting to test the feasibility of the questionnaires and an interview schedule. This was done to ensure that essential data is

prioritized. Subsequently, that permitted the researcher to make necessary amendments to the questionnaires and interview schedule.

### **1.7. Significance of the Study**

The study seeks to add to the literature that the current phenomenon of the 4IR would lead to a distraction and threaten the performance of SMEs in the long run. Hence, there are many challenges associated with the 4IR that potentially stand to impede the performance of SMEs, and to a greater extent, affect the workers. Indeed, the study took into cognizance, the opportunities that would be created by the 4IR but argues that such opportunities can be afforded and maintained by big businesses, leaving out SMEs in the space of advanced technology and widening the business inequalities. It brings the conceptual comprehension of the 4IR and helps prospective business entrepreneurs to take into account the technological aspects of their businesses. The significance of the study is to scrutinize and explore the impact of the 4IR on the performance of SMEs. Correspondingly, exploring the phenomena of the 4IR towards SMEs allowed the researcher to get into the depth analysis and more detailed literature about the phenomena and close that vacuum. This study would also assist future academics, government, and policymakers who wish to embark on the same discipline to read and critique the literature and make their own suggestions and inferences. Lastly, the study provides recommendations on how SMEs could improve their performance taking into consideration the impact of the growing technology.

### **1.8. Ethical Considerations**

The study considered ethical concerns which are; issues of privacy, informed consent, and confidentiality to mention a few, which were concomitant to the study. All the information that was used in the study from existing literature was acknowledged and authors were credited as such, to avoid plagiarism. Be that as it may, the study was voluntary to the participants. It also considered the respondents' anonymity and did not divulge their information to the public.

### 1.8.1. Respect and Dignity

The study acknowledged that the participants have different principles, social perceptions, and ideals. Therefore, the values, culture, and traditions of the participants were treated with dignity and were respected at all times. The rights and ideas of the participants were valued with morality and treated ethically as part of their mutual humankind. Moreover, having their views and perceptions listened to, is part of showing politeness, respect, and dignity. Equally, the participants were given the right to make their own decisions. The researcher showed humility, great respect and dignity throughout the process of data collection.

### 1.8.2. Harm

The study ensured that no physical, legal, social or emotional harm or any other harm that might unsettle the participants occurred. Hence, the likelihood of the questionnaire and interviews causing discomfort or posing risks to the participants was insignificant because the researcher is well-trained in respect of being considerate of the social principles and ethics of the community. The researcher protected the anonymity and confidentiality of the participants' information to ensure that their responses were kept safe and were not used against them or their businesses. The safety of the participants was prioritized.

### 1.8.3. Benefits

The study ensured that the owners of SMEs were directly involved during the study process. The participants acquired profound knowledge and had an opportunity to re-look at their business strategies and enhance their business. The study also provided information in detail that the participants may use for improving their businesses. The study had an influence and contributed positively towards the interpersonal development of SMEs owners.

### 1.8.4. Standard of Care

Although the standard of care is insufficiently discussed in social research, it gives the researcher an opportunity to highlight it. The findings of the study will be shared with the

participants to give them information regarding the subject under investigation so that they could enhance their businesses. Additionally, the participants were not exposed to risks or any danger. The researcher expressed care for the participants and made them feel comfortable during the process of the study and did not force them to partake in the study. This means that the participants were given the autonomy to choose to either participate or reject participating in the study.

#### 1.8.5. Informed Consent

Informed consent is perceived as the cornerstone of getting relevant information about the interest of a specific study. The study provided full information to the research participants so that they could make informed decisions and provide relevant information. Therefore, the study did not force the participants to partake in the data collection process. The participants were made aware that they would not get any form of complementary/gratuitous gift or award during the process of the study. Moreover, the participants were allowed to reject, accept or withdraw their interest in the study. The views and opinions of the participants were always respected.

#### 1.8.6. Confidentiality

The participants were guaranteed that the information they provided would not be divulged to the public and would strictly be confidential. In that, participants were assured of the privacy and confidentiality of their details. This was done to ensure that the participants feel free knowing their information is private and would be protected. The participants were also assured that the information provided was solely used for the purpose of the study and was not used against them. Thus, the authenticity of the study is to remain accurate and genuine to the participants.

### **1.9. Structure of the Dissertation**

The dissertation is structured as follows:

**Chapter 1:** This chapter discusses and covers the introduction and background of the study and or the research title. It discusses the statement of the research problem, aim

and objectives, the definition of terms, research design and methodology, the significance of the study, and lastly ethical considerations.

**Chapter 2:** The chapter stipulates and discusses the argument of the study looking into the literature review from an international scale to strengthen its debate and argument on the impact of the 4IR on SMEs. It starts by discussing the theories that guide the hypothesis of the study i.e., two theories which are technological determinism theory and modern management theory. Furthermore, it also discusses the main themes such as the challenges and benefits of the 4IR, the types, and characteristics of SMEs, and the impact of the 4IR on the performance of SMEs.

**Chapter 3:** This chapter deliberates and debates its aim and objectives from a South African context. It highlights South Africa's readiness for the 4IR, a synopsis of SMEs in South Africa, the challenges of SMEs and covers some of the support initiatives for SMEs.

**Chapter 4:** The chapter provides data analysis and interpretation of the collected data. It further interprets such data findings emanating from the questionnaire and interview schedule.

**Chapter 5:** This is the last chapter of the study that provides the conclusion and recommendations based on the findings of the study.

#### **1.10. Limitations of the Study.**

The study was limited to only covering SMEs concerning the impact of the 4IR and did not go outside the parameters of its scope. The study was also limited to its target population and the study area of Mankweng Township. These kinds of limitations were taken into cognizance during the process of the study to avoid generalization and confusion.



## **Chapter 2: THE FOURTH INDUSTRIAL REVOLUTION AND SMALL AND MICRO ENTERPRISES: A REVIEW OF EMPIRICAL LITERATURE ON AN INTERNATIONAL PERSPECTIVE**

### **2.1. Introduction**

Technology is one of the utmost phenomena, its significance has been supported, acknowledged, and embraced by many countries who see it as a smart industry, smart manufacturing, and innovative industry (Manda & Ben-Dhaou, 2019). The 4IR brings a lot of opportunities and challenges concurrently in the space of SMEs in the economy. Thus, a review of the literature serves as a backbone to this study and acknowledges what other scholars have documented regarding the subject under investigation (4IR) and attempts to identify the gaps. Below is the critique and a review of literature on the impacts of the 4IR on the performance of SMEs and broad discussion on the issues concerning SMEs. The chapter commences by discussing the theories that are most relevant to the study. It also discusses the benefits of the 4IR in SMEs. Furthermore, the section covers the challenges of the 4IR concerning SMEs. Moreover, the section will discuss the types and characteristics of SMEs and lastly the impact of the 4IR on SMEs. The chapter provides a conclusion as the last section to summarize the discussions.

### **2.2. Theoretical Framework**

Theories are speculative hypotheses for dissecting the purpose and how the world's many elements interact. Theorizing discloses a well-defined and confined area of realities (Charmaz, 2015). Theoretical literature strengthens the study as it provides an explicit statement of theoretical assumptions, which permits the reader to evaluate them critically (Charmaz, 2015). It also helps to identify the limits of the generalizations that may arise in the research process. Theoretical literature specifies which key variables influence a phenomenon of interest and highlights the need to examine how those key variables might differ and under what circumstances (Reiter, 2017). Solid theories result in better questions and valid questions lead to new elements of reality being discovered (Charmaz, 2015; Reiter, 2017). As a result, theories cannot be true or untrue since they do not have an ontological character (Reiter, 2017).

Reiter (2017) clearly shows that without theory, it is impossible to know where and what to look at; without theory, it is impossible to figure out which elements are important to the argument. Thus, even if the order comes from our minds, theories build a concrete order and provide meaning to reality. Without theory, one would see a chaotic jumble that contains no information and is devoid of structure and 'meaning' (Reiter, 2017). Therefore, to generate better rational arguments, these theories (technological determinism theory and modern management theory) are considered and included in the research process, as well as made clear and related to the subject under investigation of this research. Hence, the role of theories in the study is to attempt to limit vague hypotheses by being more specific to what the researcher investigates.

#### 2.2.1. Technological Determinism Theory

The theory emerged from the development of social and biological science (Drew, 2016). The author also avers that the theory considers the historical development process of technology and the modernity of technology. Meanwhile, to Hauer (2017) the theory holds a view that human and social elements should relate and be pertinent to inevitable technological advancements. This means that technology determines how people live in the current space of technology and that cannot be overlooked. Some principles guide the technological determinism theory.

Technological determinism primarily talks about the technological competence principle. The principle is about organizing and managing individual tools of digital technologies to compete and extend their capabilities to use computer programs (Hauer, 2017). Within this principle, individuals must be able to process data from different sources in different formats and it includes legal issues of using digital technology (Hauer, 2017). Therefore, the technological competence principle is extended to and associated with the components of the 4IR. These include, but not limited to; advanced computer programs and digital technologies which would be exorbitant to SMEs and impact their performance thereof. However, the world is now in an epoch of the digitalization of information and other software.

The theory also uses the digital literacy principle to acknowledge the skills, knowledge, and ability of individuals to use digital technology and modern equipment among others (Hauer, 2017). The principle also relates to internet literacy to complement Information and Communication Technology (ICT) in terms of knowledge and skills (Hauer, 2017). The principle could be coupled with the information society principle which is tantamount to the progress for a better society and those social woes would be salvaged by technology (De Miranda & Kristiansen, 2000). For that reason, the digital literacy principle and the usage of advanced technological equipment are a disadvantage to SMEs. Hence, most SMEs are not adequately technologically resourced in terms of their skills, financial status, capabilities, and capacities to maintain the current 4IR (Maloka, 2013; Ramohale, 2015). Consequently, the 4IR is associated with the benefits and challenges that would impact the performance of SMEs. Similarly, the study draws its interest on the developments of modernization theory wherein, modern and innovative technology is at an advanced stage of the 4IR and attempts to analyse and analyse its impact on the performance of SMEs.

Wyatt (2008) shows that many actors' behaviour and reasons are still influenced by technological determinism. The author stresses that technological determinism continues to be used by analysts to explain the adoption of technology in several social contexts; it can be found in a variety of conceptual and philosophical explanations of the technical-social connection. It survives in lawmakers' and politicians' replies to questions about the necessity for or desirability of new technology, as well as in one's attitude whenever presented with new equipment and new methods of conducting activities (Wyatt, 2008). However, Bimber (1990) therefore, agrees that the phrase is used to convey a wide range of viewpoints on how technological enterprise interacts with other parts of human activity. The term highlights the importance of technology to social development for various reasons, but they vary about why and how technology is so dominant (Bimber, 1990). According to Paul (2006: 3) "the shift from feudalism to capitalism, the shifting occupational and skill stability of the workforce in the twentieth century, the advent of post-industrialism in the post-World War II era, the successive beginnings of the digital

age, post-Fordism and globalization” have all been influenced by technological determinism. Paul (2006) posits that technology does certainly shape much, maybe too much, of current culture, however, its influence is unique to a particular historical time. Perhaps, from the writings of Paul, one could insinuate that technology cut across all the spheres of human life and the economy. To be specific, technology also influences how SMEs should conduct their businesses taking into consideration the elements connected to the 4IR.

Wyatt (2008) in literature, makes a perception that even though it is just a few years into the twenty-first century, it is impossible to determine which of the century's numerous emerging innovations would be acknowledged by coming generations. The author further elaborates that although causation may not always be apparent, the practice of connecting places and periods with their technologies persists in thinking processes. Bimber (1990) suggests that technological determinism is used by certain researchers of technology and societal change as if it were indisputable. Therefore, Bimber's (1990) latter argument is corroborated by Wyatt (2008) who affirms that the idea of technological determinism holds a view that technical advancement equals societal improvement. One of the concerns with technological determinism is that it eliminates human decision and involvement, as well as absolving the onus for the technology that is created and used (Wyatt, 2008). The hypothesis that could be drawn from the views of the authors of technological determinism theory is that this theory could be juxtaposed and connected to the 4IR since the 4IR is more concerned with creative and advanced technology. In that, the 4IR draws its foundation from the views and actions of technological determinism theory.

#### *2.2.1.1. Approaches of Technological Determinism Theory*

This study refers to the writings of Bimber (1990: 337-339) to extend the views or the approaches of technological determinism theory. There are three approaches to technological determinism theory by Bimber (1990), namely, the norm-based account of technological determinism, logical sequence account, and unintended consequences account, and they are briefly outlined below.

➤ *Norm-Based Account of Technological Determinism*

The core concept of this approach is that the societal renunciation of influence over technology occurs when there is no wilful oversight over technical practice, or when ethical norms are replaced with efficiency and effectiveness goals (Bimber, 1990). Perhaps, this could mean that although technology is good for societal and economic progress, it has an uncondusive influence in certain instances of the society which could not be avoided (Bimber, 1990).

➤ *Logical Sequence Account*

Machinery and related subhuman capabilities 'work as separate organizations of history' according to technological determinism (Bimber, 1990). The argument here is that technologies have a consequential effect on social behaviour. For instance, despite their societal acceptance or prior social practices, many technological processes need structures of an organization to be more advanced. Moreover, Bimber (1990) avers that certain technical industries, such as railroad and manufacturing, need newer technologies, such as the internet or large-scale, hierarchically structured steel manufacturing factories.

➤ *Unintended Consequences Account*

This approach is predicated on the fact that technology is often associated with unexpected repercussions that even the most foresighted interveners are incapable to predict and manage (Bimber, 1990). This occurrence is understood to indicate that technology is at least somewhat self-contained and that it oversees certain societal consequences (Bimber, 1990). Similarly, the 4IR is perceived to have and associated with some societal and economic challenges that could influence how SMEs should operate. Though the challenges of the 4IR could be predicted, it is necessary to put in place precautionary measures specifically to aid SMEs.

#### *2.2.1.2. Modernized Technological Determinism Theory*

Heilbroner (1994) acknowledges that technological determinism is a dominant and a powerful tool of history, particularly in the history of socio-economic developments wherein, the fundamental shift from feudalism to capitalism transpired in different phases. Perhaps, it is true that technology is a tool to enhance and transform the hegemony of capitalism. Moreover, the author further indicates that in this theory, the machines are making history in a change towards the social and economic settings. Annotating the thoughts of Heilbroner (1994) in the 21st century, technological determinism theory needs to be revisited again to abreast it and make it relevant to the current state of technology. Currently, the inception of the 4IR technologies adds innovation to the already existing technology. Therefore, the 4IR draws its dominance and evolvement from the technological determinism theory which is increasingly becoming inevitable. Hence, technological determinism theory should subsequently, include the elements of the 4IR technologies. Such technologies encompass, the IoT, AI, Automation, CPS, and bio or nanotechnology amongst others (Schwab, 2016). This is how an updated version of technological determinism theory would be structured.

Heilbroner (1994) and Paul (2006) emphasise that technological determinism does not mean that technology has no impact on society, it has much influence and brings change to society and business in particular. Heilbroner (1994) insinuates that technological determinism theory has a “framework of explication” that bring the forces of development together. The author further elaborates that the theory is dominated by the usage of machines to enhance civilization and change social relations as well as influence the process of socialism and capitalism. This, however, could mean that technology brings a historical change in society, and it continues to be accelerated by the latest technological developments. That is why the elements of the 4IR are pertinent to enhance and shape the transformation of technological determinism.

#### *2.2.2. Modern Management Theory*

The theory has been developed to directly respond to the classical management theory (Kitana, 2016). The classical management theory’s premise is that employees have

physical needs and satisfy such needs with hard work and money to be more productive (Kitana, 2016). Meanwhile, modern management theory postulates that an organization is a system that includes three systems of modern management theories, namely, the systems approach, contingency approach, and quantitative approach, and such approaches change the organization's environment both internal and external to better manage the business (Olum, 2004). It also talks about using modern management of technology and avoiding hard labour, to strengthen its arguments that technology should be adopted in businesses to improve production (Olum, 2004; Bobrek, & Sokovic, 2006). Perhaps, this is coupled with an innovative principle that seeks to enhance the business through the usage of modern technology among others. The relevance and conjecture of this theory on SMEs are that it enhances business productivity through technology and its flexibility in modern business management inter alia (Dent, & Bozeman, 2014). It is, however, fundamental that the management or managers of SMEs take the advantage of this theory for business persistence in the current space of the 4IR and apply new methods of modern business management to perform and stay competitive in the current market.

According to Olum (2004: 8) in an article titled, "*Modern management theories and practices*", there are four attributes that managers and employees to a larger extent, need to manage their business and achieve their desired objectives. These attributes are necessary for both the managers and employees of SMEs to have, and they are outlined here below:

➤ *Technical Skills*

This (technical skills) refers to knowledge of and proficiency in activities involving methods, processes, and procedures. Thus, it involves working with tools and specific techniques. Hence, the managers of SMEs should have such technical skills to keep their businesses running. The technicalities of operating modern technology are fundamental in ensuring that SMEs' owners become competitive.

➤ *Human Resources*

Working with people is a human natural ability; it is a communal endeavour; it is collaboration; it is the development of an atmosphere wherein the people feel safe and able to voice their ideas (Olum, 2004). Human resource is the core foundation for SMEs and a prerequisite for the managers of SMEs to possess to fulfil and meet the required targets of their businesses (Olum, 2004). However, it appears that most of SMEs owners and employees to a greater extent, do not have the necessary human resources skills and knowledge necessary to match and complement the current growing technology (Ramohale, 2015). These kinds of challenges are featured and discussed in this study to give an overview of the challenges of SMEs.

➤ *Conceptual Skills*

The capacity to serve the great picture is referred to as conceptual competence. It is more about detecting important aspects in a scenario and comprehending the interconnections between them. From this point, one could indicate that conceptual competence is one of the elements that the managers and employees lack because conceptual competence perhaps, builds on human resources so that both managers and employees be competent in the execution of their duties. Mashavira and Chipunza (2021) aver that conceptual competency includes entrepreneurship knowledge and skills and planning capabilities to ensure the success and management of the organization. According to Katz (2009: 18) cited in Mashavira and Chipunza (2021:6), conceptual skills refer to “the ability to see the enterprise as a whole; it includes recognizing how the various functions of the organization depend on one another and how changes in any one part affect all the others and it extends to visualizing the relationship of the individual business to the industry, the community, and the political, social and economic forces of the nation as a whole”. Meanwhile, Mustafa and Ayse (2017) understand conceptual competencies as being part of the administrative skills that managers of businesses should have as part of their middle or top management level.



➤ *Design Skills*

Design skills are referred to as the capacity to address issues in a way that benefits the company. Managers should be capable to do more than recognizing an issue, but rather be competent, especially at the higher management level (Olum, 2004). Managers and employees should, therefore, possess the essential ability to devise a feasible approach to an issue in light of the circumstances they confront (Olum, 2004). Therefore, all these attributes are required to ensure the effective and efficient running of SMEs. In modern management theory, there are known approaches, namely; the systems approach and the contingency approach that strengthen the argument of the theory.

*2.2.2.1. Modern Management Approaches*

The modern management approaches lengthen the gist and argument of the modern management theory. The approaches provide a direction of the theory and assist the managers as well as the employees in effectively managing the organization (Olum, 2004). Accordingly, the approaches are briefly described here below.

➤ *Systems approach*

Rather than focusing on separate components, management is regarded as a whole system with a goal that is made up of interconnected elements in a systems approach (Kitana, 2016). Managers may view the whole organization and enclose themselves within the context of broader and external factors using this method. When one part of a business is damaged, this theory provides a bird's eye view of the repercussions in other sections (Kitana, 2016). Moreover, Olum (2004) insinuates that in management, systems theory has the advantage of assisting managers in taking a broader view of the company. It also makes it possible for managers to analyse the trends and happenings at work. For instance, managers will be able to distinguish the many elements of the organization, as well as their interrelationships (Olum, 2004).

➤ *Contingency approach*

Kitana (2016) highlights that in a contingency approach, the managers are required to identify the optimum strategy for the issues under certain conditions and at specific times

to accomplish organizational objectives. Meanwhile, Olum (2004) claims that in terms of the situational or contingency theory, managers make a choice, they must consider all elements of the present circumstance and react to elements that are critical to the scenario at present.

This section highlighted the theoretical incisions or approaches that the study undertook as its guideline. The theories discussed covered both concepts i.e., SMEs and the 4IR. Ultimately, such theoretical underpinnings gave meaning, rationale, and gist to the study, and the argument of the study was discussed within the context of such theories. It has discussed in length, the theoretical principles and ideals that relate to the study. It is, therefore, obligatory for the owners of SMEs to consider the theories discussed in this chapter for the improvement of their business's performance. Interestingly, the theories could not only be beneficial to SMEs but could build on the capacity of the SMEs' owners in a way of providing human resources to them. Hence, human resource is the foundation for the growth of any business. The following section is empirical literature that discusses the impact of the 4IR on the performance of SMEs.

### **2.3. The Challenges and Benefits of The Fourth Industrial Revolution**

Different forums such as the World Economic Forum (WEF) and the business society organizations have extensively discussed the pros and cons of the 4IR in the 21<sup>st</sup> century. This phenomenon (4IR) is embraced by both developed and developing countries which could assist in radically growing the economy. Meanwhile, at the centre of their discussions and debates are the challenges and benefits associated with the beginning of the 4IR in the business sector. Therefore, it is incontrovertible to acknowledge the efficiency of the 4IR in the 21<sup>st</sup> century that it makes the business environment fascinating wherein, it is easy to access tasks, online trading, and 3-D printing among others (Rojewski & Hill, 2017). In conjunction with the 4IR, one could further assert that SMEs play a significant role in the current status of the economy and must be supported to equally compete with advanced technology. Hence, such role(s) is/are to uplift the economic status-quo of the townships by creating employment opportunities be it self-employment or creating employment for others. However, considering that society is

forever in motion and changing, the SMEs and their working methods of the old-fashioned way need to be changed to respond to the market needs through the 4IR (Penprase, 2018). The 4IR has the advantage of enhancing and easing the cost of doing business within the SMEs fraternity in different countries. However, it is significant as a point of departure to attempt to comprehend the perceptions and the views of the 4IR on the performance of SMEs.

### 2.3.1. The Perceptions of the Fourth Industrial Revolution on Small and Micro Enterprises

A successful business transformation requires a deepened comprehension of the 4IR, its technical elements, its challenges, and benefits, and how it operates in the business realm. The 4IR indicates a new innovative way in which new technology becomes rooted in societies and influences how society should operate (Kang, 2017). Kang (2017) further indicates that hyper-intelligent and hyper-connected are the main characteristics that are brought by the 4IR which shows a rapid technological change and the development of the ICT, clouding, the IoT, and CPS which change the old way of production. Be that as it may, Germany is upfront in the 4IR with its national strategy of high tech 2020 which converges the ICT and manufacturing sectors as one key national project (Kang, 2017). Germany uses this national strategy and supports all the big companies and SMEs respectively to achieve their national imperatives through Artificial Intelligence (AI), innovative ways, and CPS among others (Kang, 2017). Similarly, British SMEs survive and thrive during the period of the 4IR by creating innovative products (Laforet, 2008). Therefore, it is blatant that in the period of the 4IR, SMEs need to rethink their business strategies to keep up with the growing technology.

The 4IR has gained a spotlight in Japan which has resulted in the country establishing a new robot strategy to ameliorate the challenges of low fertility and an aging society (Kang, 2017). This is how the future of the world would be painted through the instigation of the 4IR and shape the socio-economic conditions of the world. In that, countries in the world would be required to be resilient and flexible to move with time and innovation in the business sector. That means, new and smart, creative, and innovative business approaches should be established by SMEs in the ICT sector to be able to have a

competitive advantage in their market (Laforet, 2008; Rojewski & Hill, 2017; Wisskirchen et al., 2017). The hyper connection is of utmost significance to facilitate the operations of the businesses and should be intensified in the business sector in the epoch of the 4IR to connect and enhance the trading of businesses. As a result, local and international communications networks in SMEs would be converged as one unit to make the physical trading and locality irrelevant as the internet connections become a new method of trading (Parry, 2018). The essence of a smart internet connection means that buying and selling would be done online and remotely, thus, it could perhaps, substitute physical trading if not complementing it. This new method and innovative way of doing business are known as “electronic technology” (Parry, 2018). Electronic technology is a new tradition and a culture of trading at the centre of the 4IR that could make SMEs thrive in their sales and marketing. However, given the nature and challenges that SMEs face globally, electronic technology is a phenomenon that would extremely be a challenge to SMEs because of the lack of skills, knowledge, expertise, training, cost, and maintenance. Hence, to date, inadequate resources in SMEs sector remain a huge challenge globally (Maloka, 2013; Ramohale, 2015).

The pros and cons of the 4IR are extensively discussed globally to characterize the potential future of the countries, people, and the business environment. In the business environment, SMEs would be vulnerable to experiencing such pros and cons of the 4IR. One of the benefits of the 4IR in SMEs is to improve the functioning and curtailing costs among others (Kang, 2017). However, SMEs are suffering and bear the significant impact of the 4IR because, the 4IR comes with a lot of innovative ways of doing things in the business environment which requires financial investment (Parry, 2018; Fomunyam, 2019). Such innovative ways include the components of AI, robotics, IoT, IoS, CPS, biotechnology, and nanotechnology among other things, to improve the functioning of SMEs. That comes with a lot of maintenance, investments, and costs that are likely unaffordable SMEs. Henceforth, SMEs in countries such as Nigeria, Botswana, and Kenya among others, are facing challenges such as poor finance, limited resources, and a lack of infrastructure to be able to utilize the components of the 4IR (Maloka, 2013).

Penprase (2018) and Fomunyam (2019) suggest a stance that workers need an induction to continuously update their skills and inculcate themselves with the new technological developments that were not there during their time of training and learning for their initial qualification to enhance business productivity and effectiveness. It can be elaborated on the latter point that the 4IR requires an element of creativity within SMEs and critical thinking from the workers to be pertinent to the current business sector dominated by technological advancement. Similarly, Rojewski and Hill (2017) acknowledge the existing vacuum within the Career and Technical Education (CTE), pointing out that new frameworks must be initiated to respond to the woes of the 4IR and go beyond more usual to creative thinking in the businesses. Therefore, Morgan (2019) shares the same sentiments with Rojewski and Hill (2017) by emphasizing that the industrial revolution is divided into two parts, according to modern theory: the first stage is having skill-saving technical development and minimum academic needs, and the second stage is concerned with increased availability of human resources as skills are essential for productivity.

Although the use of new technologies to improve, modify, or maybe even destabilize business strategies to achieve a competitive edge is widely documented in the literature from both an operational and strategic standpoint (Schwab, 2016; Thuc, 2017; Penprase, 2018), it has a significant impact to the performance of SMEs in a sense that SMEs are not able to afford nor maintain the latest innovative technologies. In the same breath, small firms have a variety of problems and are often restricted by resources (e.g., time, data and expertise, and money) that prevent them from being the first to embrace new technology and limiting any other first benefits associated with the 4IR (Akpan, Soopramanien & Kwak, 2020). Furthermore, Akpan et al (2020) understand that beyond this pivotal moment in history, businesses have experienced and will continue to endure the creation and adoption of new emerging and disruptive technologies across all aspects of their operations and strategies.

The Indian government also embraces the current technological advancement as they have initiated the national strategy for artificial intelligence (Prisecaru, 2016; Kang, 2017).

Additionally, one could observe the Chinese developments with their popular “made in China” 2025 strategic manufacturing plan to enhance their country into a hi-tech powerhouse (Fomunyam, 2019). In the same breath, President Uhuru Kenyatta of Kenya seems to fathom the use of technology as the 4IR is gaining momentum with the launch of digital currency in Kenya (Fomunyam, 2019).

In the fearless time of the 4IR, almost every organization looks for advanced change with a ground-up revamping of their business tasks to be computerized, as opposed to the old traditional way of conducting businesses. Numerous organizations have effectively moved to utilizing cloud applications for their business measures. For instance, from booking to taking transcription and past, there is a presumable application for that (Schwab, 2016). There is no doubt that a continuous fight between innovation and people has invigorated fear in worldwide history. Starting with the Industrial Revolution (IR) in the 1800s, when machines ruled the labour force, the anxiety of machines and robots taking individuals' positions started (Prisecaru, 2018). That fear is already around the world as a result of the 4IR. However, many people from everywhere in the world began to accept that modern technology (4IR) is meant and planned to supplant society as well as rule humankind. Undeniably, new organizations and businesses are continually being made and existing organizations are re-creating themselves. Accordingly, occupations and occupational jobs have been changing at a frantic speed. Businesses are relied upon to meet and accept these changes, yet regularly with no thought of what the new job assumptions are for workers. However, below are the benefits of the 4IR concerning SMEs.

### 2.3.2. Enhanced Productivity and Efficiency

The advantage of the 4IR in the business environment is that automation and the excessive use of robots lead to enhanced productivity coupled with efficiency (Guoping et al., 2017; Kang, 2017). This also improves a considerable amount of savings in the businesses in terms of labour costs and products. Notably, the only significance of the 4IR is to enhance the efficiency and productivity of SMEs to grow the economy and development (Prisecaru, 2016). Meanwhile, the usage of machines and robots in the

automotive sector in Germany are more efficient and productive way to manufacture cars (Wisskirchen et al., 2017). Wisskirchen et al (2017: 14) make an analysis that the usage of a robot is cheaper in China than a worker. That means one of the benefits of the 4IR in SMEs environment is to reduce the exorbitant amounts of costs. That is because the machines, robots, and computers cannot be ill, take a monthly or annual leave, have children and to a larger extent go on strike for the increment of wages or salaries (Prisecaru, 2016; Kang, 2017).

The new epoch of the 4IR concerning SMEs means that robots, computer systems, or any other machine does not rely on external dynamics to do the work. Thus, it is reliable and consistent during the day or night and can work in perilous conditions to deliver the desired outcomes at the end of the day (Kang, 2017). Moreover, Wisskirchen et al (2017: 14) contend that the accuracy of the computer, robot or any other programmed machine is better and greater than that of a human being. For instance, in the epoch of the 4IR, work could be consistent and coordinated to good use and subsequently enhance the effectiveness, efficiency, and better performance of SMEs (Kang, 2017). Indeed, the decision or the result made by an automotive computer can never be emotional nor subjective, decisions are always objective (Schwab, 2016; Morrar et al., 2017; Wisskirchen et al., 2017). The current generation finds the 4IR fascinating as they are connected to different devices to keep up with technological transitions through the IoT and CPS amongst others.

### 2.3.3. Cyber-Physical Systems and Internet of Things

Cyber-Physical Systems (CPS) refer to the network connection between humans, machines, objects, and products (Luff, 2017; Wisskirchen et al., 2017). It is worth noting that billions of people are connected to mobile devices with the ability to access and exchange knowledge (Kang, 2017). In this current state of technological advancement, that would be multiplied by the AI, automation of vehicles, robotics, 3-D printing, biotechnology, nanotechnology, computing, and the IoT to mention a few (Prisecaru, 2016; Schwab, 2016; Guoping et al., 2017). Thus, the advantage to the privileged workers in SMEs is that they less hard work to do and have more latitude to do their additional

activities. The CPS and IoT enhance the functioning of SMEs through internet connectivity and enhance ICT infrastructure (Luff, 2017). The CPS plays an indispensable role in the integration of the physical world and the virtual world (IoT, ICT, sensors, cloud) in the business sector. The debate on the 4IR is gaining the spotlight in different countries internationally such as India and China.

The businesses (SMEs) should be able to follow the development and the implementation of the 4IR to ensure the ability of the customers in accessing the information through the utilization of the CPS and IoT (Prisecaru, 2016; Schwab, 2016). Consequently, this enhances the communication channels between the business and the stakeholders. Therefore, the application of big data, IoT, IoS, automation, robotics, and ICT amongst others, ensures greater flexibility and a faster production process (Wisskirchen et al., 2017). Unwin (2019) shows an example that the internet was initially developed for academic purposes, with the first development of an E-mail in the 1970s and the World Wide Web (www) in the 1980s. It was noted that during the 1990s, the expansion and usage of the internet began to grow more rapidly. Equally, the CPS is seen to be an imperative Key Enabling Technology (KET) (Xu, David & Kim, 2018). This means that at the core of the 4IR is the CPS which is significant in ensuring that all the physical elements and realities are connected to a digital system. The CPS talks to smart connections which means the ability to get data and manage it through intelligence and sensors to ensure proper communication procedures (Schwab, 2016). This is supported by the digital twin, which shows real and physical information and digital reality (Luff, 2017). Therefore, all these components and characteristics of the CPS are used to facilitate and enhance the production of the businesses. The IoT denotes the interconnectedness and inter-networking of physical devices which connect the systems that go beyond Machine to Machine (M2M) (Xu et al., 2018). The CPS and IoT are important systems in the business sector to ensure their sustainability. However, SMEs with their inevitable challenges are not able to use, afford, maintain and integrate such IoT and CPS in their system. Recent circumstances demonstrate that technology that facilitates socioeconomic business development, customer engagement control, innovative communication networks, virtual



world innovations for network capabilities, and the Internet of Things (IoT) is critical to cutting corporate expenses (Akpan, et al., 2020). In the present tough economic climate, big data, predictive, and visualization techniques are important facilitators for assisting complex organizational choices (Akpan, et al., 2020). Akpan et al (2020) in their article titled *“Cutting-edge technologies for small business and innovation in the era of COVID-19 global health pandemic”*, acknowledge the significance of information and communication technologies which they often refer to it as digital technologies. In their analysis, they indicate that information and communication technologies profoundly contribute to improved access to external credit which is ultimately linked to comprehensive financial inclusion. The authors extend and assess that digital technologies are the key drivers for SMEs to sustain their customer network and come up with good innovations. This essentially refers to the flexibility of the working environment within SMEs.

#### 2.3.4. Flexible Working Environment

It is incontrovertible that the advanced technology at this juncture has become a tool for working, and communication and influences how the work environment is conducted. The SMEs owners have the latitude to provide an option to their employees to work remotely, from home, or anywhere they feel comfortable in the execution of their duties. This would, of course, improve a considerable and significant amount of saving in the businesses. The 4IR provides an opportunity for small businesses to have a competitive edge in the local and international markets (Luff, 2017; WEF, 2017). This is possible only if SMEs adopt and utilize the existing and innovative technology to their advantage. A flexible work environment is achieved through the connection of the internet, the usage of AI, and the application of CPS in businesses (Schwab, 2016; Wisskirchen et al., 2017). A yea-sayer may corroborate that flexibility is a way of indicating coordination of activities in the business. It ensures that production is carried out effectively and smoothly for business advancement (Schwab, 2016; Naudé, 2017).

### 2.3.5. Improved Customers' Connection

The owners of SMEs would no longer wait for too long, days, months, or even years for feedback from the customers (Schwab, 2016). That is because the 4IR provides an opportunity for small businesses with the ability to connect with their customers (Donner & Escobari, 2010). Customers' connection is linked with social media communication channels. Hence, customers would be connected through social media channels such as Facebook, Emails, WhatsApp, Websites, Telegrams, Google-meet, Zoom, Skype, and Twitter amongst others. Hence, these media channels could be known as the "smart internet". Afterward, small business owners could make use of these media channels to improve their communications with their customers (Donner & Escobari, 2010). This ensures the effectiveness and smooth running of the businesses with updated technology. At the centre of the improved connections, is the connection of the internet and proper ICT infrastructure in the businesses (Brookins, 2020). This is the new tradition and a means of communication among different stakeholders. In fact, social media tools are providing ways in which business could liaise with their customers more conveniently. This is very important because it reduces the costs of transport. After all, less people would be traveling to access one another as issues could be communicated and resolved through social media channels. However, the benefits of the 4IR also bear a significant portion of challenges in SMEs realm. Such challenges are elucidated here below.

### 2.3.6. Artificial Intelligence

The inception of artificial intelligence is already around the world, from automated machines (self-driven cars) to virtual assistants and software that has the potential or is programmed to translate and speak (Prisecaru, 2016; Schwab, 2016). A study by Xu, et al (2018) indicates that perhaps AI is the "emerging age of wisdom". The authors (Xu et al 2018) further posit that robots are computerized motorized tools in technical terms as they prepare meals, listen to music, record programs, and even drive an automobile. As a result, robots can now enhance the standard of human lives at home, at work, and in a variety of other settings. Personalized robots generate new employment, raise the efficiency of existing jobs, and allow humans to devote more time to their passions (Xu et al, 2018). Robots have gotten smarter and more independent as a result of AI and

machine learning, however, they (robots) still lack an important function which is moral thinking (Xu et al, 2018). This inhibits their capacity to make fair or decent judgments in tough circumstances (Prisecaru, 2016; Xu et al, 2018). This is their weakness.

The smartness and innovativeness of the AI and other technological advancements are at the centre of the development of the 4IR, and this trend continues to be accelerated by the big corporates. That ultimately requires the low-tech SMEs to compete with the big corporates in all three aspects of the economy which are local, national, and international scale to afford the elements of the 4IR and concurrently respond to social and economic aspects (Kang, 2017). Schwab (2016) expresses an understanding that the 4IR disrupts almost every industry in different regions of the world as far as AI is concerned. However, it is of great concern and a worry about the future of the low-skilled labour that would be taken away by machines and AI.

Hypothetically, an optimist may put forward an altercation that the 4IR requires the establishment of digital pedagogy for SMEs to comprehend the components associated with the 4IR (Rojewski & Hill, 2017). This exterminates the old-fashioned models of doing business within the low-tech and labour-intensive SMEs. Hence, Yoshino and Taghizadeh Hesary (2016) and Penprase (2018) contend that labour-intensive sectors are anthropocentric humanism. Artificial intelligence developments are pointing to major economic upheavals in the future years (Xu et al, 2018). Artificial systems that handle difficult issues logically represent a danger to many types of jobs, but they also open up new opportunities for socio-economic development (Xu et al, 2018). Be that as it may, another challenge of the 4IR concerning SMEs is that it decreases the confidence of the new entries to penetrate the markets, hence the cost and maintenance associated with the 4IR would be unbearable to SMEs (Prisecaru, 2016). Indeed, reducing the cost is done at the expense of the workers. However, the 4IR comes with challenges of automation in SMEs environment that would often impede their traditional way of doing business.

### 2.3.7. Automation

According to Wisskirchen et al (2017:12), the 4IR talks to automation in production which is characterized by the factors such as production controlled by the machines amongst others. The production controlled by the machines means that the production process is fully automated depending on the nature of the business (Luff, 2017; Wisskirchen et al., 2017). Therefore, the automation of production results in the SMEs not being fully competent in that level of automation. Simply because their nature of being SMEs and inadequate technological capacity and resources makes it hard to adapt to the automation of production and because the so-called 'smart factory' does not resonate well in their business environment. Equally, Luff (2017:37), agrees that some managers do not understand well the concepts of the 4IR. Meanwhile, additive manufacturing is one of the concepts that pose challenges in many of SMEs in the South African township areas.

### 2.3.8. Additive manufacturing

Additive manufacturing is one of the elements of the 4IR that greatly impact SMEs. Additive manufacturing refers to a mass and fully automated manufacturing process (Moos & Sambo, 2018). It creates a way for innovative designs and manufacturing processes. Additive manufacturing is a disruptive process but adds new ways to the manufacturing process in businesses (WEF, 2017). The worst amongst the disruptive processes is 3D micro-manufacturing. The implementation of 3-D printing remains low in SMEs because of poor technology and inadequate infrastructure (Yoshino & Taghizadeh Hesary, 2016; WEF, 2017).

### 2.3.9. Unemployment

What is of fretting factor is that the labour-intensive countries such as China, India, and Bangladesh to a greater extent, are still profiting from the surplus of the low-skilled labour. Meanwhile, the heavyweight western companies still outsource their products from these countries (Prisecaru, 2016). Equally, the inception of the 4IR in the 21<sup>st</sup> century causes a fiasco in terms of employment opportunities, wherein people are retrenched from their work and are being replaced by machines and robots (Luff, 2017; Naudé, 2017). In

sectors such as clothing and textile that still use workers in Bangladesh and Thailand, workers remain at risk of being replaced by machines (Wisskirchen et al., 2017).

Thuc (2017) and Wisskirchen et al (2017: 16) project that 47% of employment is at risk in the United States of America (USA) and approximately 70% of employment is at risk in Thailand and India. The possible unemployment as a result of the 4IR could lead to a mass revolt and human catastrophe. But, in as much as the 4IR brings about massive and exciting opportunities to SMEs, it has major threat to the workers, employment, and to a larger extent, the economy and would lead to the national calamity and catastrophe of unemployment in the near future (De Villers, 2019). All this is because of technological advancement that led to the restructuring of companies and affects the employees and emerging young entrepreneurs. That already killed the potential and confidence of SMEs that seek to penetrate the market because of the exorbitant cost of technology.

#### **2.4. The Types and Characteristics of Small and Micro Enterprises**

The common statement that SMEs are seen to be the champions, source of economic transformation, and poverty reduction has been thoroughly investigated and yielded positive outcomes (Maloka, 2013; Ramohale, 2015). This is because SMEs worldwide seem to be the driving force behind local economic development in different countries. The SMEs differ from country to country, but their common immediate aim is to ameliorate their socio-economic woes (Gumel, 2019). Most developing countries are faced with high levels of poverty, unemployment, and inequalities which affect the ordinary people who have no source of income. These predicaments and hardships necessitated the establishment of SMEs globally to be their safety nets and extricate themselves from dire living conditions, particularly in township areas. SMEs become a part of owners' livelihood strategies that bring a sense of ownership to their local economies and perhaps practice the agglomeration of economies for their business survival. In countries such as Botswana and Nigeria, SMEs exist in both formal and informal sectors.

#### 2.4.1. The Attributes of Formal and Informal Small and Micro Enterprises

The informal sector SMEs are more frequent in remote rural areas and townships, and they are less likely to require a highly qualified workforce than the formal sector SMEs (Vanek, 2014). Because informal SMEs are more common in rural areas and townships, salaries in the informal sector are often low. This is because the informal sector's market typically includes numerous firms selling the same items, making it difficult to generate large returns due to competition (Ligthelm, 2006). Literature perused by Sishuba (2018) indicates that the presence of informal enterprises is required to smartly handle social interaction in social and economic situations.

The (informal businesses) provide a favourable setting for harnessing political, monetary, and societal aspects intertwine. The major goal is to guarantee that proper procedures are followed. Meanwhile, the formal SMEs are expected to adhere to all the relevant legislations, such as complying with tax payments, paying the employees' benefits, and allowing for labour laws to come to pass (Pauw, 2008). However, there are different types of SMEs and characteristics of SMEs.

Bhorat et al (2018) understand that employees are divided into two categories: formal sector workers and informal sector workers. Firstly, employees are considered formal sector professionals if their business deducts taxable income. Secondly, if the business does not subtract income tax, they are considered formal sector employees if the firm employs five or even more people (Bhorat et al., 2018). Employees in the formal sector have much higher education than the personnel in the informal enterprise, implying that poorly qualified labour is a bigger restriction for micro informal enterprises than it is for small formal enterprises. Because females, youngsters, Africans, and the less skilful are under-represented within formal sector company owners, these sorts of enterprises (informal) may have greater hurdles for employees with lower labour market results (Bhorat et al., 2018). Hence, the study by Bhorat et al (2018) finds that around 70% of informal company owners utilize their profits to purchase household products. Below are the types and characteristics of SMEs.

#### *2.4.1.1. Information and Communication Technology Enterprises*

One of the business segments that would be of paramount significance in the 21<sup>st</sup> century and which would thrive in the technological space are the businesses to be found in the ICT. These types of businesses are seen through the usage of technological software and hardware to render their services to their customers (Afolayan, 2014 Schwab, 2016). The acquisition and usage of computer equipment, programming, and telecommunication technologies are all part of ICT usage. An interesting study by Taruté and Gatautis (2014) found that ICT has a significant influence on improving internal and external connections. Therefore, the 4IR would be of great influence in such business types to introduce new methods and new software to conduct their businesses using the ICT systems (Schwab, 2016; Mousa, 2017; Penprase, 2018). This is also a form of digital age revolution wherein businesses would adopt the “new normal” of conducting their businesses (Afolayan, 2014). These types of business include amongst others; internet cafés, online tutorship, web designs, graphic designs, and business registrations (Afolayan, 2014; Mousa, 2017). These SMEs should be well adequate with the new ways of doing their businesses to stay in the market and be able to compete on a larger scale. This would require SMEs in the IT sector to have smarter applications, enhanced data storage, and faster information processing and communication (Brookins, 2020).

ICT is purposeful for businesses since it is a useful resource. This is because ICT is a source of the business model of innovation which results in significant efficiency. Because of ICT, employees can form tighter bonds with one another as a result of company procedures, a company's suppliers, customers, rivals, and collaborating partners helping the company to be more reactive to possibilities for innovation (Soriano et al., 2019). Moreover, Soriano et al (2019) perused the literature and highlight that organizations that invest in ICT, especially those who view it as a growth strategy, are far more likely to participate in digital transformation.

#### *2.4.1.2. Agricultural Businesses*

This industry is currently driven by technology. The 4IR would not only affect the businesses in the IT industry but to a larger extent shape how farming (agriculture) should

be undertaken. The 4IR is concerned about innovative ways of doing business and introducing new machines. This changes the face of farming wherein; new machines for irrigation and farming would be introduced. This is necessary because farming is a labour-intensive sector which would ultimately change how farming is done. The agricultural businesses are seen as part of a livelihood diversification that has the potential to uplift people from poverty and food insecurity (Mashamaite, 2014). This sector has been improved significantly with technology and perhaps technology has influenced the genetic modification of organic crops to increase the production of food across the globe (Mashamaite, 2014). Therefore, the application and implication of technology in agricultural businesses (SMEs) cannot be disregarded in the current period of smart technology. Smart technology (4IR) put into question the capacity and ability of SMEs involved in agriculture to participate actively in agricultural activities. Hence, the conjecture that SMEs face common challenges such as lack of finance, skills, and poor technology would make it cumbersome for such businesses to actively participate and keep up with the growing technology. The agricultural businesses are seen through crop farming. SMEs in the agricultural sector include subsistence farming and or smallholder farming.

In Spain's agricultural sectors, technological adoption was a major determinant for innovation, and it was highly influenced by company size and export focus (Soriano et al, 2019). Diversification provides smaller businesses with competitive advantages in meeting the requirements of smallholder farmers, rural areas, customers, and the community (Jackson-Smith & Hoy, 2020). From the thought of Jackson-Smith and Hoy, perhaps, small businesses should diversify and be open to new technological innovations that could enhance their production system. A study conducted by Jackson-Smith and Hoy (2020) shows that agriculture is by far the most significant and profitable and competitive industrial economy for small businesses in the USA. The authors further indicate that scientific advancements and technological advancements have provided fresh insights into the multifaceted processes of agricultural landscapes in a space of agricultural businesses. New technological innovation can help farmers diversify their agricultural methods while also providing chances for micro-business expansion



(Jackson-Smith and Hoy, 2020). However, Panasyuk, Safiullin, Gafurov, and Safin (2014) indicate that Russian micro businesses in the Agro-Industrial Complex (AIC), irrespective of their poor technological and scientific ability, ineffective business strategy, social difficulties in rural areas, and so forth, create objective barriers towards their productivity progress.

Agriculture is a significant sector of the United Kingdom's SMEs' environment, although it is hardly included in discussions about innovation and entrepreneurial growth (Warren, 2004). Research by Warren indicates that agricultural companies employed 550,000 individuals in 2002 which is 1.9% of the total workforce. Smallholder farmers' businesses can use e-commerce to get access to the international market while also lowering input prices by increasing efficiencies and/or circumventing geographical supply monopolies (Warren, 2004). However, Warren (2004) concludes that agricultural (SMEs) are falling behind in the UK, in terms of technology usage. Perhaps, this conclusion may be true because Maloka (2013) and Ramohale (2015) agree that SMEs are facing challenges ranging from financial to human resources. Therefore, the performance of agricultural SMEs will be negatively affected because of such hiccups.

#### *2.4.1.3. Electronic Repairs*

The skill and knowledge of the electronic repair businesses are questionable in this era of technology. The SMEs which are engaged in the electronic repairs would be greatly affected by the 4IR. Broken and damaged electronics provide an opportunity for the establishment of such businesses in rural and township areas. Electronic repairs seek to ensure and boost the lifespan of electronics or electrical appliances. As a result, the owners of such businesses can feed themselves and their families (Maloka, 2013). However, to a great extent, these types of businesses also improve the local economy (Meso & Manamela, 2015). The challenge to these businesses would be to afford or purchase new and advanced electronic equipment that is being manufactured exacerbated by their financial challenges. SMEs in this industry would be required to update their skills and knowledge and improve their learning. Electronic repair businesses include television repairs, fridge repairs, stove, and kettle repairs *inter alia* (Maloka,

2013). These kinds of businesses are characterized by their nature of repairing what has been damaged depending on the business type.

## **2.5. The Impact of the Fourth Industrial Revolution on the Performance of Small and Micro Enterprises**

The impact of the 4IR is in fact deep and profound, penetrating all the disciplines ranging from all business types, education, and social life and changing the buyers and sellers' relationship (Luff, 2017; Naudé, 2017). It is worth noting that the 4IR has a negative impact on SMEs, putting them under pressure to compete locally, nationally, and internationally. The negative impact such as not affording the price and maintenance of the 4IR, creates limited opportunities for the solopreneurs who do not have sufficient technological expertise. Additionally, the direct impact of the 4IR on the performance of the SMEs is seen through low profits, loss of customers, less savings and to a larger extent, poor skills and knowledge of the 4IR. However, the pragmatic impacts of the 4IR are tolerated and advanced by multinational corporations to enhance productivity and maximize profits because they appear to have sufficient resources. Meanwhile, De Miranda (2006) indicates that there are winners and losers in technological advancements. The author further points out that new technologies are connected to a neo-liberal free market wherein, the big companies and transnational corporations are able to discover new markets for trading while poor businesses attempt to find innovative methods to enhance their economic conditions.

The opportunities and benefits brought by the 4IR which are to enhance access to a more digital platform and improve the selling and marketing of the businesses cannot be ignored (Kang, 2017). Subsequently, in a space of technological advancement, SMEs are perceived to be the victims of a mass technological fiasco. That is because most the SMEs are low-tech businesses and cannot afford the exorbitant costs associated with the current technological developments. SMEs that are in the retail sector experience challenges wherein sales and marketing services are going down due to a lack of technological capabilities such as AI (Park, 2018). In that, AI such as virtual machines perform daily functions or transactions, which are smart and recommend the best options

to the customers (Schwab, 2016). Meanwhile, Vrchota et al (2019) agree that investing and upgrading technology could be exorbitant, however, it is necessary because it ensures high quality of the product, improved productivity and enhanced effectiveness and efficiency. However, this causes the small businesses to use excessive maintenance capital, which they do not have to sustain the machines. One could vividly note that the 4IR causes an ordinary small business to employ more specialists and experts who are well acquainted with the phenomenon of the 4IR which they currently do not have.

## **2.6. Summary**

The 4IR is a highly contentious phenomenon associated with both negative and positive impacts on various sectors of society ranging from how people live and behave to business sectors. However, the impact of the 4IR on SMEs would significantly lead to the weakening and deterioration of small and micro businesses in the future. That is because, most of SMEs in townships already experience challenges such as lack of finance, poor skills and knowledge and are low-tech, mostly in developing countries. Hence, the inception of the 4IR components such as automation, CPS, IoT, IoS, and AI amongst others, are likely to be exorbitant to SMEs. The literature theoretically reveals that the 4IR is a disruptive process that requires SMEs to have the capacity to build on their existing skills and knowledge to be pertinent in the current space of technology.

It must be acknowledged that the benefits brought by the 4IR cannot be overlooked in enhancing the production and efficiency of SMEs. That would boost the local economy in township areas, particularly in developing countries such as Botswana and Nigeria amongst others. That would ultimately increase the GDP of the developing countries and develop the local economies. Authors such as Schwab, (2016); Kang, (2017); Luff, (2017) and Wisskirchen et al (2017) extensively critiqued the phenomenon of the 4IR which has been central to this study.

## **Chapter 3: THE IMPACT OF THE FOURTH INDUSTRIAL REVOLUTION ON THE PERFORMANCE OF SMALL AND MICRO ENTERPRISES IN SOUTH AFRICA**

### **3.1. Introduction**

South Africa is one of the developing countries in Africa. It is one of the countries in Africa that also put forward its concerns and perception as far as the 4IR is concerned. South Africa is known to have one of the best economies, particularly in Southern Africa region which is doing well. However, the country has its successes and misfortunes in development. The country has hosted symposiums, forums, and colloquiums to discuss its readiness for the commencement of the 4IR. The symposiums focused on different aspects of the 4IR and how it would affect and shape the future of the country. Such aspects included amongst others, areas of education, agriculture, and business environment. However, the dawn of the 4IR in South Africa presents new opportunities and challenges for SMEs to grow or fail (Xing & Marwala, 2017).

The SMEs in South African townships are known to be the champions of local economic development and subsequently contribute toward nation-building (Meso & Manamela, 2015). However, the 4IR requires SMEs to consider new marketing methods, and their strategic policies for business survival and to re-skill their employees to be more effective in operating the machines or computers *inter alia* (Penphrase, 2018). Mesnard (2016) concurs that the 4IR would demand new skills and requirements for education to enable people to deepen their understanding and functioning of the 4IR components. A study conducted by Kobayakov (2016) reiterates that there is a need to query the existing skills and capability of SMEs in rolling out technologies brought by the 4IR. Shava and Hofisi (2017) extend this further by implying that in the next five years going forward, there would be a need for new skills to match the latest technological innovation from the businesses.

### **3.2. The Prospects and Predicaments of the Fourth Industrial Revolution in South Africa**

Xu et al (2018) approve that while each industrial revolution is typically thought of as a distinct phenomenon, it could be better seen as a succession of developments that build

on the preceding revolution's discoveries and result in increasingly sophisticated forms of production when taken collectively. The 4IR is a fascinating phenomenon wherein new opportunities and challenges in a space of business environment are brought up. Xu et al (2018) portray that the 4IR is defined by a convergence of technology that blurs the distinctions throughout the "physical, digital, and biological" realms. It is a phenomenon that requires constant abreast of business models and their strategies to be relevant in the inception of the 4IR (Penprase, 2018). At the current juncture, the world is experiencing innovative technology which is defined by others as smart technology. The 4IR would change how SMEs conduct their business affairs in South Africa. It would do so by requiring new inventions, innovations, ideas and changes in business models.

Shava and Hofisi (2017) warn that since the 4IR is much anticipated, there is an urgent need to take action and equip people to match the anticipated new technologies. Xu et al (2018) conclude that customer aspirations, quality of products, the shift towards joint development and organizational improvements are the primary consequences of this revolution in the business arena. Drawing from the thoughts of Xu et al (2018) the impact of the 4IR affects the performance of SMEs, because SMEs do not have adequate resources to be on the same trajectory or phase as the 4IR. Therefore, this theme aims to dissect and discuss the challenges and benefits of the 4IR concerning SMEs in South Africa. Against this background, the theme commences by analysing the readiness of the 4IR in South Africa.

To Schwab (2016) the premise of the 4IR is that it would revolutionise everything. Schwab (2016) understands that the 4IR is unstoppable because it always seeks new ways to transform the production process and the lives of the people. Technology is planned and created by people with an aim to address a particular need. Perhaps, technology was designed to make an income, make certain people famous, make businesses flourish or overcome any predicaments in all spheres of life, from social, cultural, economic and environmental aspects. However, the imagination, creativity, and ambition of individuals who create manufacture, and market technology are what transform society, not the technologies themselves (Unwin, 2019). In essence, people are still spoilt for choices to

make in respect of the current technology. The development of technologies that are associated with “smart cities” could, therefore, be seen as a marginalizing tool for those residing in rural areas. But still, people have unlimited choices to make about technology. Such choices could either be disruptive or beneficial to their livelihood diversification.

### 3.2.1. The Readiness of the Fourth Industrial Revolution in South Africa

The debate about the 4IR requires South Africans to have a deep comprehension of the current smart technology. South Africa is one of the less developed countries with high unemployment, poverty, and inequality. South Africa as a developmental state with the zeal to curtail the socio-economic woes is not ready for the 4IR, because of massive triple challenges (unemployment, poverty, and inequality) that continue to be a tragedy and haunt the country. The 4IR would worsen unemployment, wherein people would be replaced by machines and robots (Wisskirchen et al., 2017). This is a disaster waiting to explode at the peak of advanced “smart technology”. Perhaps, the current skills available the people do not match the skills required by the advanced technology (4IR). This is due to the educational system that produces graduates with limited skills to be able to capitalize on the current technology (Penphrase, 2018). However, to salvage this crisis, South Africa should prioritize the skills and knowledge which would be necessary to meet the demands of the 4IR.

It is imperative to encourage students/emerging/prospective young business entrepreneurs during this epoch of the 4IR to enrol for degrees and diplomas which would not be easily automated. Mesnard (2016) highlights that the 4IR necessitates a change in educational teaching and learning and that people should be taught new skills and acquire relevant knowledge. Therefore, to ameliorate such a shortage of skills, people need to study degrees and diplomas such as psychology, law, human resources, and social work to name a few. In an inexorably unique and associated worldwide economy, new organizations are continually being made and existing organizations are re-creating themselves (Wisskirchen et al., 2017). Accordingly, occupations and occupational jobs have been changing at a frantic speed. Businesses are relied upon to meet and accept these changes, however, regularly with no thought of what the new job assumptions are

for workers (Schwab, 2016). Mind improvement is not an extravagance for the few; it is an unquestionable requirement for many as South Africa is battling to deal with socio-economic dilemmas amid the 4IR. How would one be able to fortify mind network at whatever stage in life because upgrading complex critical thinking, novel reasoning, passionate insight, nimbleness, adaptability and key leadership are considered to be the top abilities to prevail in the 4IR, as portrayed by the WEF.

In the past 5 years and to date (2022) South Africa has witnessed and still going through the pain of an unstable electricity supply. This is an unpalatable crisis of electricity. The main national electricity producer in SA is ESKOM and has been and still is struggling to provide electricity consistently in the country. As a result, it implements what is known in SA as “load-shedding”, which means that electricity is provided in stages and cut off for certain hours. This unfortunate situation transpires in an epoch where the country is attempting to industrialize the economy. Hence, industrialization requires electricity (Parry, 2018).

The challenges at ESKOM also transpire in a period where the 4IR is at the forefront of rejuvenating and resuscitating the economy. To cut the long story short, South Africa is not ready for the 4IR because of poor electricity supply which impacts negatively on the performance of businesses. Therefore, electricity is the primary source of the 4IR, whereas load-shedding is the primary enemy and a threat to the success of the 4IR (Parry, 2018). The author (Parry, 2018) agrees that electricity was the technological breakthrough that permitted expansionism and socialism to flourish. Therefore, the stance and utterance by Parry is still relevant, especially in this modern society. This is because electricity is the foundation and an essential factor in respect to a smooth transition of modern technology (4IR). Apart from the benefits of the 4IR, it also poses challenges to SMEs as far as technology is concerned.

Current policies and educational training curricula should be re-visited to be in line with the growing and innovative technologies as a result of the 4IR for South Africa to be active and ready to implement 4IR technologies (Penprase, 2018; Vu & Le, 2019). This could

be necessary for sectors or disciplines such as engineering, automation, CPS, IoT, AI and robotics amongst others (Schwab, 2016). Evaluating and updating the training programs would aid in meeting the demands of the current technology and assist in predicting how technology would unfold in the future. Therefore, Vu and Le (2019) agree that this is a good idea that would enable people to acquire high-quality human resources and adapt to various employment that could change in practise. Hence, potential young and emerging entrepreneurs could strongly emerge if the training programs and regulations are changed to respond to the changing technology. To achieve such changes, Vu and Le (2019) indicates that Conceive = Design = Implement = Operate (CDIO) approach should be at the forefront. This is, however, a cornerstone of the curriculum. Hence, the objectives of the approach outlined by Vu and Le (2019: 72) to complement the current and growing technology are listed below:

- To ensure that the training meets the desired outcomes
- To ensure that the outcomes thereof, show the abilities and capabilities of the students to meet the requirement of the current market
- To equip students with a “broad-based knowledge and skills” that would enable them to be more creative. However, the challenges of the 4IR are discussed here below:

### 3.2.2. High Cost and Maintenance

The SMEs in South African township areas are facing myriad challenges for their performance, growth and survival. The new and smart business models that come with the 4IR are foreign to them because most SMEs still use old business models to conduct their business affairs (Luff, 2017). The equipment and other technical facilities are not updated to keep the business stay relevant in the current market (Penprase, 2018). This implies that most of these SMEs still use old business models because it is apparently cheap and viable for their businesses. Perhaps, this is because SMEs are still in the third industrial revolution that does not understand how the 4IR would affect their *modus operandi* because of the slow pace of the 4IR. This is complemented by SMEs which are still labour-intensive sectors to do their production and trading (Wisskirchen et al., 2017).



One cannot avoid that the world is changing, and technology decides and defines how to conduct business affairs in the realm of SMEs. The advanced technological elements such as IoT, AI, CPS, robotics, automation and more digital require a lot of financial investment and maintenance to keep the business profitable and successful (Prisecaru, 2016). Accordingly, Prisecaru admits that the disruptions of the 4IR are initiated by big businesses who manipulate online platforms to enhance their sales, marketing and production. However, persistent financial challenges of SMEs would make it hard for businesses to afford and maintain such elements of technology (Maloka, 2013; Ramohale, 2016). Consequently, SMEs are not able to have a competitive advantage over their rivals and contribute significantly to the local economy because they do not afford the high cost and maintenance of the 4IR.

### 3.2.3. New Skills and Knowledge

The 4IR is a new phenomenon in the 21st century that brings about changes in the learning environment. The 4IR requires new skills and knowledge from the people to be able to use the advanced technological machines. The new emergence of skills and knowledge is necessary for SMEs to be able to utilize their production more effectively (Schwab, 2016; Penprase, 2018). This new phenomenon of the 4IR means that individuals must be trained and taught through different workshops and forums to understand what the 4IR means and how to prepare for it to keep the business running (Rojewski & Hill, 2017). However, the old skills and knowledge should not be obliterated because some of them could be used in the business process. That could be called prior knowledge which is necessary to have in the 4IR period. Coleman (2016) strongly agrees that the inception of AI would lead to a shortage of skills because there would be limited people with skills and specialists in the area of AI. Therefore, Coleman (2016) further claims that the AI and other new technologies would require new skills and specialists to support the growing technology.

The problem is that the inculcation of new skills and knowledge requires additional resources from SMEs. These additional resources refer to finance and infrastructure

amongst others to organize and carry out the programs and projects for the purpose of re-skilling up the employees (Rojewski & Hill, 2017). This requires SMEs to hire people with extensive knowledge of the 4IR, AI, 3-D printing, IoT, IoS, etc to train their employees (Penprase, 2018; Fomunyan, 2019). To be broader, SMEs could even outsource such skills and knowledge, however, they cannot do so because of poor financial muscle. Hence, the challenge is that this is costly as the low-tech SMEs have inadequate resources.

#### 3.2.4. Data Security

Data security remains a concern for businesses because the 4IR is about digitization and online connections and trading. More activities and information are shared online which are a threat to data privacy and security. Due to electronic business trading, new opportunities for breaching and hacking data are high (Parry, 2018). This could put a business in a difficult position. This means that the business must act fast and put other security measures to protect their data. Xu et al (2018) extend the latter point by indicating that while workers may unintentionally or purposefully lose or steal data, the most serious assaults in past decades have been external hostile cyber-attacks, collectively or generally referred to as hacking because of poor data security. The data security challenges are coupled with cloud computing challenges to businesses. Cloud computing means that the software applications are done and accessed online which makes data security and privacy more vulnerable to being breached and hacked by people (Schwab, 2016; Luff, 2017; Parry, 2018; Xu et al., 2018). This jeopardizes business operations and transactions. Meanwhile, Cho and Woo (2017) posit that due to the destructive aim of terrorist acts, data protection is yet another central factor that have an adverse impact on the company's environment. For this reason, preventative countermeasures and defensive systems are required to counteract the consequences of terror occurrences. The authors further highlight that some techniques prevent future cyberterrorism attacks from happening by using radiation control to analyse past cyberterrorism assaults. Additionally, it is important to build business defence systems and train personnel against cyberattacks. Businesses are required to pay for information warfare remedies but given

the potential harm that a cyber strike may pose the projected overall cost is likely to be large (Penprase, 2018).

### 3.2.5. Infrastructure Development

The 4IR requires proper infrastructure to operate efficiently and effectively. The infrastructure, in this case, would mean the connection and installation of 4IR components for the proper functioning of operations in SMEs realm. The infrastructure is of utmost significance in the operations of the 4IR components such as machines, computers and robotics to mention a few (Shenker & Surana, 2002; Guoping et al., 2017). Hence, the infrastructure would enable swift work of the 4IR (Stoica, Adkins, Zuang, Shenker & Surana, 2002; Guoping et al., 2017). One could observe that the nature of SMEs in the townships in South Africa is such that the infrastructure is poor and even worse in the congested areas, with no open spaces and highly-density areas such as Alexander Township in Johannesburg, South Africa. Equally, SMEs in Mankweng Township are not in a state of proper infrastructure for purposes of the 4IR to function well (Maloka, 2013). One would, therefore, suggest that another challenge is that the IT infrastructure is not completely ready to support the digital transformation in township areas. Hence, poor IT infrastructure remains a huge challenge in most of Less Developed Countries (LDC) (Manda & Ben-Dhaou, 2019).

Chipangura and Kaseke (2012) indicate that SMEs performance and productivity are hampered by undeveloped physical and social infrastructure, as well as restricted access to public infrastructure activities. Moreover, SMEs rely largely on public infrastructure, which can be unstable and expensive at times. According to Reinikka and Svensson (2001) cited in Chipangura and Kaseke (2012: 51) that a lack of infrastructure hinders activities, access to the market and raw resources, and consequently hampers the business's expansion. However, the lack of infrastructure facilities becomes an obstacle to those with ambitions to enter into the space of businesses (Emizie, 2017). Emizie further claims that infrastructure is the core foundation which determines the failure or breakthrough of small businesses. One of the conundrums that exacerbate infrastructure development in South African townships is poor maintenance. Hence, infrastructure

decay remains a major challenge for most townships in the country. The availability of infrastructural facilities should be constantly maintained to lure in the potential young businesses to enter the space of a competitive market. Inadequate public infrastructure is a mutual concern to SMEs as it limits processes and obstructs access to markets and raw materials. Maloka (2013) therefore, observes that the majority of SMMEs in South Africa do not have access to public infrastructure services. Notwithstanding the challenges of the 4IR concerning SMEs, the 4IR also has positive benefits that could assist SMEs to achieve their objectives. Such benefits are discussed here below;

### 3.2.6. Enhanced Production and Marketing

The 4IR provides an opportunity for businesses to maximize their utility. Everything is fast and easy because of access to technology. No one can deny that the current technology changes the way people behave and how businesses operate. Without any doubt, the 4IR increases the production and marketing of the businesses (Kang, 2017). Hence, the 4IR means that new innovative and cost-effective methods would be put in place to enhance the image of the businesses through their sales and marketing strategy (Wisskirchen et al., 2017). Technological resources such as the IoT, IoS, smart industry, robotics and AI amongst others, would be utilized to enhance production and marketing (Prisecaru, 2016).

Access to technological connections could ultimately assist small businesses to compete with multinational corporations (Wisskirchen et al., 2017). This means that access to technological resources could help SMEs to be competitive. Positively, the 4IR means that SMEs have an opportunity to double their production. This could be done through the usage of AI which permits businesses to save costs and enhance their business capacities and capabilities (Wisskirchen et al., 2017). For example, a machine, robot, or computer does not need to be compensated (salaries) monthly as compared to the people. That would mean a significant increase in savings (ease the cost of doing business) and improved production and marketing.

### 3.2.7. Improved Efficiency and Effectiveness

With the adoption of technology in the business environment, effectiveness and efficiency would greatly take the business to a new level. The employees do not have to do much of the work because the machines, computers and other software would be programmed to do the work effectively and efficiently (Wisskirchen et al., 2017). The term(s) “effectiveness and efficiently” means that the work is performed without any waste of resources in the business (Prisecaru, 2016). This indicates how profound technology is in terms of effectiveness and ensuring the sustainability of businesses. Additionally, consistency is one of the keys to ensuring effectiveness and efficiency in the business (Kang, 2017). For instance, the products produced by the machine, robot or computer are expected to be 100% consistent provided that the machine, robot, or computer is not damaged. Shava and Hofisi (2017) corroborate the views of Kang (2017) by stating that modern technology curtails barriers to business development and enhances efficiency in the working environment.

### 3.2.8. Enhanced Coordination

Unequivocally, technology is a devoted element in the current workplace that seeks to achieve coordination of activities in the business. Due to technological advancement, working has been made simple with the usage of desktops, smartphones, AI, and internet connectivity to enhance the coordination of activities (Donner & Escobari, 2010; Schwab, 2016; WEF, 2017). The coordination of activities, departments or units within the business is possible and could be linked together to achieve better results (Donner et al., 2010). The coordination could also improve production, curtail costs, and increase the profits of the business. Therefore, SMEs should use this opportunity of technology to their advantage for their survival and competitiveness in the market.

## **3.3. Small and Micro Enterprises: Their Kinds and Attributes**

There is a heated and aggressive scholarly debate in terms of the types and characteristics of SMEs. This means that there is no universal consensus on the types and characteristics of SMEs. That implies the context in which one uses to define the types and characteristics of SMEs which do not offer the final inference thereof.

Therefore, the study considers as its purpose, the types and characteristics of the SMEs are described here below.

Generally, SMEs are characterized by similar attributes that define their operations. They are usually characterized by their size depending on their business type (Bhorat et al., 2018). Micro businesses employ the smallest number of employees, which is usually less than 10 people including the owner (Hall, 2018). Meanwhile, small businesses usually employ approximately 25-49 employees (Holátová & Monika, 2013). They are also characterized by their market area. That means, SMEs exist and are concentrated in a specified location and are usually not pervasive or universal as compared to big businesses (Ingram, 2019). They are convenient business entities in a rural or township vicinity. That is coupled with the limited area as one of the general characteristics that SMEs exist in limited areas (Ingram, 2019).

SMEs (solopreneurs) are usually the dynamic and vibrant business segment that provides opportunities in mostly township/rural areas (Meso & Manamela, 2015). The common types of micro-enterprises in South Africa include catering, photography, internet café, childcare centres and event planning to name a few (Maloka, 2013). Meanwhile, small businesses are viewed as profit-oriented enterprises that are owned independently but do not dominate their industry and local market (Gregory, 2019). SMEs serve a fundamental purpose of enhancing the quality of life particularly in rural and township areas. These business entities (SMEs) are known for their nature to provide services such as hair salons, footwear, clothing and spaza shops to lift the local economy, create jobs and strengthen the purchasing power (Maloka, 2013). Because of the nature of SMEs being small, they are unlikely to grow unless a radical strategy is put into motion (Kenton, 2019).

Several SMEs are commonly and inextricably linked to their owners in a sense that earnings are considered as remuneration, and savings for new stock are derived from the same profits, whilst the owner can also use enterprise money for personal use and utilize personal finances to meet business requirements (Bhorat et al, 2018). This relates to the

fact that SMEs have survival characteristics, implying that the livelihoods of business owners are inextricably linked to the business's income (Bhorat et al, 2018). However, this section would begin with a brief overview of SMEs in South Africa.

### 3.3.1. A Synopsis of Small and Micro Enterprises in South Africa

The democratic breakthrough in South Africa meant with great alacrity and effort that the country would be able to ameliorate some of its socio-economic challenges significantly. The breakthrough meant that the high levels of unemployment, poverty and inequality would be at least reduced through different projects and programs (Meso & Manamela, 2015). Despite the democratic breakthrough, South Africa still experiences great triple challenges (poverty, unemployment, and inequality), wherein people continue to live in tragic conditions and still experience the pain of poverty and inequality. Therefore, this has led to the formation of SMEs in South African townships to remedy such triple challenges. Bryce (2017) confirms that the absence of access to financing, labour regulations, crime rates, poor quantities of innovation and technology, and under-skilled workforce, and lack of market access are all common factors that SMEs experience in South Africa.

The establishment of SMEs remains the only hope for township dwellers to be able to survive under the economic hardships in South Africa. SMEs are part of the livelihood diversification in the country with the potential to improve the township/ local economy. They are normally established by people without any formal business qualification (Meso & Manamela, 2015; Ramohale, 2015). These types of businesses lack formality in their operations (Maloka, 2013). This means that SMEs do not have a comprehensive strategy or a plan for operation and direction (Mutoko, 2014). These are the people with great enthusiasm to start their businesses and experience the hardships thereof. The management of SMEs is *sui generis* (one of its kind) because the manager is both the founder and owner of the business (Maloka, 2013). However, the micro-enterprises in the whole spectrum of SMEs have often been ignored in South Africa because of their little contribution to the country's economy.

The SMEs in South Africa are a broad range of business types in townships. They range from internet cafés, bakeries, hair salons, spaza shops, panel beaters, brick manufacturing, catering, etc, which makes the local economy to be active and vibrant (Maloka, 2013). They could also be a form of cooperatives and Non-Governmental Organizations (NGOs) that seek to improve the livelihood of the people. Not only do SMEs uplift the local economy, but to a greater extent contribute significantly to achieving the national imperatives of the country (Meso & Manamela, 2015). Hence, their contribution to poverty reduction, and employment creation could not be thrown under the bus. Hence, such concerted efforts should be encouraged and supported to realize the objective and the mandate of the NDP because SMEs are the backbone of the country's economy and development (Mutula & Van Brakel, 2006). Be that as it may, there are some legislative frameworks that ought to offer some assistance and govern and regulate SMEs in South Africa.

### 3.3.2. Policies and Legislative Frameworks for SMEs

The purpose of the legislative frameworks is to facilitate and support businesses in realizing and achieving their objectives. In this context, the frameworks also regulate how SMEs should conduct their business in line with the law and act/operate within the parameters of the law.

#### *3.3.2.1. National Small Business Act 29 of 2004*

The (now-repealed) Small Business Act of 1981 was replaced by the National Small Business (NSB) Act 29 of 2004. It establishes a framework for state agencies to encourage small companies and to take associated actions. The National Small Business Advisory Council (NSBAC) and the Small Enterprise Development Agency (SEDA) are established under this act. Therefore, the onus of NSBAC and SEDA is to advocate for the interest of the small businesses and the development of policies to promote, sustain and support the competitiveness of the small businesses' projects and entrepreneurship.



### *3.3.2.2. Cooperatives Act 14 of 2005*

The purpose of the act is to promote cooperatives and enhance their operations in the formal economy. In this study and context, the cooperatives are similar to SMEs. Moreover, the act provides and encourages that the cooperatives should be self-reliant in the long run. To achieve this, the act seeks to promote equity and participation, especially for black-owned small businesses in rural areas. The act also aims to provide support programs and projects, particularly to the emerging cooperatives or SMEs established by black people, youth, women and disabled people (Cooperative Act 14 of 2005). Lastly, the act connects the cooperatives with agencies such as SEDA, SETA and the South African Local Government Association (SALGA) amongst others.

### *3.3.2.3. A Co-operative Development Policy for South Africa*

This policy is created to assist both the emerging and existing co-operatives that are struggling to survive as a result of poor training. The policy seeks to provide support in the form of financial, marketing and building the capacity of the co-operatives (Department of Trade and Industry, 2004). However, according to the DTI, the objectives of the policy are listed below:

- Create a conducive environment for co-operative businesses and reduces inequalities between rural and urban areas;
- Encourage entrepreneurship;
- Promote sustainable economic development to sustain the co-operatives to contribute to the economic development;
- Enhance the competitiveness of the co-operatives to be able to capitalize on the new and existing opportunities;
- Assist the co-operatives to register and enjoy the legal status; and
- Encourage more participation by black people, women and people with disabilities in rural areas in the establishment of the business

#### *3.3.2.4. White Paper on National Strategy for the Development and Promotion of Small Business in South Africa (1995)*

Bryce (2017) conducted a study and shows that the white paper on National Strategy and Promotion of Small Business in South Africa (White Paper, 1995), was promulgated concerning the South Africa's small business policy. The white paper (1995) supports government intervention as being the primary source to support small businesses. Undoubtedly, the focus areas and objectives of the white paper (1995), formed a basis for the Integrated Small Business Development Strategy (ISBDS) from 2004 to 2014. The mission of ISBDS was/is to create a competitive environment wherein, small business transformed from small to big businesses. Indeed, change is necessary for the growth of small businesses. Therefore, the idea of transforming small businesses into big businesses was to encourage and integrate the small, marginalised and excluded small businesses in the macroeconomic economy to actively participate meaningfully in the economy. To achieve this promise of transforming small businesses, the ISBDS has three key objectives which are according to (Bryce, 2017):

- "Promotion of entrepreneurship
- The realisation of business potential through the creation of an environment that is conducive to conducting businesses
- The enhancement of competitive market to permit new business opportunities"

#### *3.3.2.5. Skills Development Levies Act 9 of 1999*

The act is extended to offer support to SMEs. Because of the poor skills and financial difficulties that SMEs experience, the act is developed to ameliorate such challenges through agencies such as Sector Education and Training Authority (SETA) (Rajaram, 2016). To achieve this the Department of Trade and Industry (2016) notes the following benefits that corroborate the objectives of the act.

- Offer workshops for skills development;
- Teaching and training courses;
- Offer learnerships; and
- Funding for projects or programs through the intervention of SETA

### **3.4. Typologies of Small and Micro Enterprises in South African Townships**

Below are the kinds and characteristics of the SMEs that exist in South African townships:

#### **3.4.1. Shoe Repairs**

Footwear is highly important to people. Every person needs and must have shoes for comfortable walking. However, it is a usual norm for certain individuals to throw away their shoes whenever they are damaged. Well, this is exactly the reason why entrepreneurs capitalize on the business opportunity to open a shoe repair market (Maloka, 2015; Ramohale, 2015; Truong, 2018). What most people do not take into cognizance is that shoe repair can boost the quality of the shoes and help to restore their favourite pair of shoes (Sweet, 2017). The shoe repair stores are seen through the hegemony of shoes, knitting of shoes and few employees. The shoe repair stores are also part of livelihood diversification for many people in rural/township areas (Sweet, 2017). Although the shoe repair industry uses certain machines to ease the process of repairing, the industry is labour intensive and requires full hands-on-deck (direct labour). Now that artificial intelligence is around us already, a robot, for instance, can be programmed to do the equivalent work that a person can do in the shoe industry, which will ultimately replace the person. However, SMEs cannot afford the cost of the new machines of knitting because of poor financial resources.

#### **3.4.2. Street Vendors**

Street vendors are at the core of urban/township/ rural areas around the world. They offer different goods and services in public and open spaces. These street vendors are predominantly visible in retail sectors, selling fruits and vegetables, accessories, electronics, clothes, and the likes (Truong, 2018). This type of business segment exonerates households from income poverty and brings food to the table and to a larger extent pay for the children's school expenses. The street vendors also provide employment opportunities for janitors, storage owners and transport operators in township/rural areas (Gamielien & Van Niekerk, 2017). Arguably, since the 4IR is concerned with digitalization, the internet of things and automation, in the end, street

vendors are going to be impacted negatively as more people will be buying their necessities and items online while sitting at home. Then, in the future, one can estimate that the opportunities provided by street vendors are going to be irrelevant at the peak of the 4IR. That is simply due to increased automation, more digital and internet connections.

#### 3.4.3. Panel Beaters

Internationally, every day a new car is purchased and needs maintenance repeatedly for it to stay intact. Well, a car would normally have problems if driven for a specific duration. That ultimately creates a space for mechanics and technicians in township/rural areas to materialize on the problems of a car (King, 2019). Panel beating becomes a business centre for local people to service their cars and fix them (King, 2019). These types of businesses are seen through fixing, servicing, and maintenance of cars. Since the new phenomenon of the 4IR is concerned with more radical and mass technological advancement, it would require a constant abreast of skills and knowledge. Therefore, the nature of panel beaters in township areas is such that they are low-tech and not equipped sufficiently to compete and afford elements of the 4IR (Yoshino & Taghizadeh Hesary, 2016; King, 2019). That means people are going to elevate to equipped panel beaters, leaving out the township panel beaters. Ultimately, that would result in the dilution of panel beaters' business negatively and to a greater degree lead to the decrease of customers, sales and the closing down of panel beaters. However, even if the panel beaters are equipped enough but the costs and maintenance associated with components of the 4IR are going to create some challenges. Therefore, the impact of the 4IR cannot be circumvented which would ultimately affect how SMEs operate.

#### 3.4.4. Bakery and Catering

Firstly, a bakery is a firm that makes bread daily. There are several distinct varieties of bread produced by a certain firm. Products are produced in the form of cheesecake and grain bread, which all have distinct flavours. Since the number of rivals in the same field has risen, the competitive environment has become more severe in recent years (Fitriana, Saragih & Luthfiana, 2017). Whilst baking bread is a simple procedure of mixing,

fermenting, and baking, it is extremely difficult to produce the same result every day. Lee (2012) argues that the rationale for this is that baking technology starts from the very first stage of bread production, mixing, and all subsequent procedures and working conditions are inextricably linked. The finding of nutritional and useful ingredients, the refining method of the latest technology, and the preservation of quality as meeting social needs are all part of the artificial evolution of baking technologies (Lee, 2012). It includes a few fundamental types of baking items, but it also has a wide range of products based on unlimited innovation (Lee, 2012).

### 3.5. The Challenges of Small and Micro Enterprises

Although there are legislative frameworks to aid the performance of SMEs, most of them continue to endure some obstacles along the way. Such obstacles hinder the attainment of SMEs objectives (Mutoko, 2014; Sishuba, 2018). As much as the government offers financial aid and other business services, the onus is for SMEs to see to their best how to utilize the services from the government and also enhance their businesses. The challenges are common to almost all SMEs but differ across the uniqueness of SMEs. To strengthen the argument of this research, the already existing challenges of SMEs in township areas make it hard for the SMEs to compete with the 4IR and be pertinent to the current market (Maloka, 2013; Ramohale, 2015). The South African SMEs in township areas face similar challenges such as lack of finance, lack of formality, inadequate skills and knowledge and poor infrastructure amongst others (Mutoko, 2014). Therefore, these challenges are elucidated below and are discussed concerning the 4IR.

#### 3.5.1. *Inadequate Financial Resources*

Access to finance and to have financial resources is the only way that small businesses grow and be sustainable. A financial resource is a crucial element that ensures the smooth running of the businesses and without financial resources, businesses would experience a total close or run at a loss (Mutoko & Kapunda, 2017). Access to financial capital remains one of the concerning challenges for SMEs in South Africa (Maloka, 2013). SMEs in Gauteng province suffer from a lack of financial management, expertise, and skills. Hence, limited access to finance or no finance is a consequence to the failure

of SMEs (Chimucheka, 2013). Most of SMEs in the townships are financed through the owners' pocket, family, and friends' donations some even get money from charity organizations as a means of capital (Mutoko, 2014). This funding depends on the type, nature, and size of the business (Agwa-Ejon & Mbohwa, 2015). Be that as it may, even if SMEs have better access to financial resources and be stable, they still must pay government taxes, and comply with government regulations which could negatively affect their financial management because of the cost of compliance with the government regulations (Mcgrath, 2013). Meanwhile, Sishuba (2018) agrees that many SMMEs are unaware of available finance and financial options. Sishuba (2018) further highlights that one of the major obstacles to the poor performance of SMMEs is a lack of finance.

For the purpose of this study, a lack of finance, and inadequate skilled human resources concerning innovative technology (4IR) are some of the obstacles that impact the performance of SMEs. Nevertheless, a safety net could be to apply for an exemption if the business experience liquidity. The worst-case scenario for SMEs is the failure of investments in their finances. This is because most SMEs are still in the informal sector without business accounts and lack of credit records. However, it is imperative for SMEs to have a bank account for the purposes of borrowing money and ensuring the sustainability of the businesses (Burrows, 2013). SMEs without well-accredited service providers, poor administration, and lack of skills and knowledge serve as a barrier to accessing financial resources (National Credit Regulator, 2011; Mago & Toro, 2013). Therefore, with the financial challenges that SMEs continue to bear, it would be difficult to purchase and maintain new machines, internet connections, robots, 3-D printing, additive manufacturing, digital connections, and CPS. Then, without these elements, SMEs would be left out of the current market, suffer great inequality and would not be competitive against their rivals.

A study by Agwa-Ejon and Mbohwa (2015) indicates that most of SMEs do not have adequate information and knowledge about financial institutions. The two authors further indicate that most of small businesses do not have a business bank account for the purpose of sustaining the businesses and performing other business transactions. It is

cumbersome to separate SMEs owners from their businesses because most of their business activities are funded by their personal bank accounts, friends, families and spouses (Agwa-Ejon & Mbohwa, 2015). The financial challenge is a major factor that impedes the performance of SMEs as far as technology (4IR) is concerned. This is particularly because to afford and maintain the 4IR technologies, finance should be the primary source to accomplish and maintain the 4IR technologies. Ramohale (2015) implies that approximately more than 82% of SMEs owners indicated that they fund their businesses from their own purses without any help from third-party organizations. This just indicates that lack of access to finance is the main constraint for SMEs owners to financially sustain their businesses. Hence, the performance of SMEs would be affected in the end.

Maloka (2013) indicates that a lack of financial resources limits SMEs' ability to acquire the skills needed and materials to implement innovative products and services, remain competitive, and continue to expand. Thus, financial constraints and limited access to finance have a negative impact on business and undermine the business' performance in the end. In the same line, Moses and Adebisi (2013) cited in Emizie (2017) echoes the sentiments of Maloka (2013) by observing that a lot of start-up business ideas are killed before they could be executed on the ground because of not having the financial muscle to turn the business ideas into a reality. Therefore, Emizie (2017) observes that financial predicaments in small businesses are linked to inconsistent financial regulations. This suggests that financial regulations such as taxes hamper the potential small businesses to take off and operate on the ground.

### *3.5.2. Lack of Formality*

Most of SMEs in township areas are in the informal sector (Maloka, 2013). This means that SMEs offer different products and services but do not comply with government regulations because they are not registered. Neither the managers nor the owners of SMEs have any form of business qualifications but start their businesses with their own knowledge and take a risk to have the business running which in turn serves as a learning process for the business owners (Maloka, 2013; Ramohale, 2015). But the role of informal

businesses in the informal economy should be acknowledged as they improve the local economy. SMEs still operate without formal business plans. The lack of business plans makes it cumbersome for SMEs to be eligible for funding from the financial service sectors such as banks, NGOs, and other government agencies (Sambo, 2018). Approximately 1.5 million SMEs operate without a business plan. This is exacerbated by poor managerial levels within the business (Miller, 2014). This means that the management of SMEs is poor wherein there is no organizational hierarchy, without any line of reporting (Soni, Cowden, & Karodia, 2015). For example, there is no human resource department, no finance unit, no administrator, etc. Hence, the owner is the one who assumes all the responsibilities of the business. Lack of formality becomes a challenge when the business wants to get for example finances, equipment, and other resources to be able to maximize their utility and stay relevant to the current period of the 4IR (Maloka, 2013; Soni et al., 2015).

### *3.5.3. Lack of Skills and Knowledge*

Skills and knowledge are critical for the development and success of the business. The skills and knowledge are the basis for the business to thrive and ensure its sustainability. This would provide the businesses with a great opportunity to be more competitive, avoid negative risks and provide a direction for the business. This is part of leadership and management within the businesses that enable the business to be innovative and be able to access the markets. A study by Soni et al (2015) found that 73.2% of SMEs owners do not have higher qualifications (colleges or university qualifications). However, for the purpose of managing, business growth and sustainability, it is essential for SMEs owners to at least have a sense of formal business qualifications. Education is still an essential tool for SMEs managers to be equipped with the critical elements of business management (Soni et al., 2015).

Most SMEs still lack the skills and knowledge to run the business in a formal way (Burrows, 2013). A lack of skills and knowledge, in this case, refers to the personnel of the SMEs without formal business knowledge and skills in areas of finance, advanced ICT, and management among others (Soni et al., 2015). Emizie (2017) agrees that



acquiring formal education is an ingredient and a means of successfully managing businesses. The owners of SMEs must have formal qualifications with skilled employees to ensure that the business can be creative and competitive (Emizie, 2017). Emizie, therefore, finds out in a study that most SMEs owners do not have the necessary skills for business supervision. Meanwhile, Vrchota, Volek and Novotná (2019) maintain that SMEs experience difficulties in having skilled personnel in the use and application of the modern technologies (4IR).

Now that the 4IR is already around us, it put into question the skills, education and knowledge that the personnel of SMEs have. Noting that the 4IR refers to the advanced technology and innovativeness, it would require new skills and knowledge to be able to use the machines and internet productively (Halverson & Collins, 2009). Now, it appears and assumed that the level of skills and knowledge in SMEs is poor and that trend would continue as the 4IR comes into effect (Laforet, 2008; Agwa-Ejon & Mbohwa, 2015). Soni et al (2015) seem to agree that the reason why there is poor or low technology is because of two reasons; which are (i) technology demands the exorbitant cost of buying and maintenance and (ii) there is inadequate knowledge about the use of ICT from most of SMEs owners. This means that technology requires modern and updated knowledge about the current technological innovation which SMEs owners appear to be lacking. Therefore, this will subsequently affect the performance of SMEs since the managers do not have adequate knowledge about the latest technology exacerbated by inadequate resources.

#### *3.5.4. Poor Access to Markets*

Access to the market is one of the keys that improve business confidence and sales significantly. It allows the businesses to explore new alternatives and opportunities which would be beneficial to SMEs. Access to the market is a gateway to the expansion of businesses locally, provincially nationally and to a greater extent, compete on an international scale (Laforet, 2008). Lack of access to markets is worsened by poor marketing skills and knowledge in SMEs which makes it hard to adapt to the market dynamics (Wiertz, 2011; Soni et al., 2015). However, the biggest challenge is the lack of

finance and internet connections to carry out the marketing strategy if need be and only if such strategy exists in SMEs (Wiertz, 2011). Literature by Sishuba (2018) highlights that SMEs lack access to the market. Therefore, SMEs would not capitalize on the new technology because of the challenges they are facing and the poor conditions that they are in to be able to access the markets.

Limited accesses to profitable markets also prevent SMEs' development and growth. The lack of access to markets in a South African context cannot be explained and understood without reference to the history of displaced communities that have been separated from mainstream markets (Maloka, 2013). As per Dockel and Ligthelm (2002) cited in Maloka (2013) market-related challenges encompass marketing, poor market intelligence, necessary products, and rivalry in the sector, wherein SMMEs trade. From the analysis of the above authors, one makes a conjecture that the market-related challenges would continue to increase as long as there are inadequate financial resources in SMEs. As a result, the performance of SMEs would be influenced or affected by the market area. At times, SMEs operate in a market where there are few customers or buyers, hence, the choice of location in the business field is instrumental. Therefore, Maloka (2013) agrees that outside of survivalist commerce, services, or manufacturing operations, many SMEs have been geographically isolated in locations with a low resource base, little currency circulation, and little knowledge about product prospects.

### *3.5.5. Lack of Innovation*

According to Abeh (2017a), SMEs are supposed to incorporate innovation within their operations in an attempt to develop long-term technology strategies. Abeh (2017b) continues to write and refers to "Innovation" as a method of generating information that is then gathered, disseminated, and connected. To put it another way, it comes in the shape of modern technologies, new products, or new services. As a result, innovation is linked to change, which may be both integrated and gradual (Abeh, 2017a; Abeh, 2017b). In most cases, innovation is defined as the use of inquiry and process to influence outcomes and businesses (Abeh, 2017b). Therefore, this study indicates that SMEs in South Africa, particularly in Mankweng Township, lack innovation due to myriad challenges such as

poor financial muscle, lack of marketing strategies, poor technology and poor skills and knowledge regarding the 4IR. Equally, this has a negative impact on the performance of SMEs thereof, because innovation is part of business growth or development.

### *3.5.6. Affording the Latest Technology (Fourth Industrial Revolution)*

Literature perused by Moos and Sambo (2018), reaffirms that access to the latest technology is fundamental and a necessity for the success of SMEs in the competitive market. The owners of SMEs should thus, take the advantage of the smart and innovative technology (4IR) to make their businesses more relevant, competitive and sustainable. This could in fact, enhance the performance of SMEs and increase their profits, effectiveness, efficiency and productivity among others. Moos and Sambo (2018) concur that the growth and development of SMEs are constrained and limited by poor or affording the latest technology and research to develop innovative business strategies. Equally, Chipangura and Kaseke (2012:51) lengthen the views of Moos and Sambo (2018) by indicating that the rationale why SMEs have poor and limited access to the latest technology is because of lack of pertinent information that could uplift the development of SMEs.

Small business owners have poor access to information about modern technology, which inhibits them from comprehending the consequences of technological innovation, identifying business and consumer demands, and making strategic and long-term market choices (Afolayan, 2014). Thus, most SMEs continue to use poor and outdated technologies. However, Moos and Sambo (2018: 10) cement by asserting that most SMEs are not abreast with the current technologies. Therefore, affording the latest and innovative technologies would continue to be a predicament for small businesses because of the lack of technology and lack of adequate resources (Chipangura & Kaseke 2012; Moos & Sambo, 2018). Chimucheka (2013) therefore, shows that beyond any doubt, the small businesses that do not have the financial muscle or resources would find it difficult to access, afford and maintain modern technology. Investing in modern technology is fast becoming a prerequisite for businesses to take it into cognizance,

hence this would assist the businesses to capitalize on the business opportunities, and increase profits and performance (Chimucheka, 2013).

Cowan and Daim (2011) and Chan et al (2012) cited in Afolayan (2014) approve that the lack of understanding by SMEs regarding the appropriateness and adaptation aspects of new technology may be a key barrier to the introduction of new technologies; lack of comprehension of the technology's adaptability and capacity characteristics (strategic expertise and integration abilities), as well as a poor ability of technology prediction and comprehension of the fundamentals of new technological breakthroughs' prospects, may also be a barrier for SMEs to utilize the latest technology. Afolayan (2014) maintains that a lack of appropriate technology and management skills essential to business management and workers, as well as the low level of educational institutions available in most developing nations, leads to broad obstacles to the adoption of appropriate and effective technological innovation.

### *3.5.7. Legislative and Regulatory Challenges*

The Organization for Economic Cooperation and Development (OECD) (2017) indicates that the issues of government regulations in terms of businesses have been found to be cumbersome and burdensome which reduces the establishment of businesses. Hence, most entrepreneurs and SMEs owners are faced with red tape or unnecessary regulatory processes and policies which appear to be one of the most difficult to conduct businesses in South Africa. At times, some SMEs and or entrepreneurs become discouraged in establishing their businesses. Adherence to the legislative and regulatory policies appears to be a greater hindrance to the small businesses and simultaneously hinders small business growth and employment creation (Shane, 2014). Several SMEs lack the resources to manage regulatory obligations such as safety and environmental standards, taxes, registrations, and processes (Chipangura & Kaseke 2012). The two authors further indicate that the taxation charges are excessive, which raises the cost of conducting business in South Africa by discouraging small businesses from registration and formalizing their activities.

Madell and Adams (2003) cited in Maloka (2013) posit that regulations emanating from a variety of government agencies may also act as a deterrent to entrepreneurship. This does not only discourage entrepreneurship, however, the regulations also kill the potential young and upcoming business people. Consequently, this could lead to hesitancy in establishing new businesses and perhaps, some legislations could be costly to the already struggling SMEs. This is corroborated by Abor and Quartey (2010) who maintain that regulatory constraints are a threat and a challenge to the development of SMEs. The authors further elaborate that the regulations, licensing and registration processes, and exorbitant start-up costs for SMEs could be an unnecessary conundrum, specifically for the SMEs that are already limping with financial and human resources among others. The World Bank Business Report (2006) as cited in Abor and Quartey (2010) indicates that the unnecessary red-tape licensing and other legal procedures take more than 176 business working days in South Africa for one to complete the whole business registration.

### **3.6. The Appropriate Measures and Mechanisms to Improve Small and Micro Enterprises**

There are different types of support structures that are available in place to assist SMEs financially or otherwise to sustain their businesses. SMEs have all the support they need from different entities, but the challenge is a lack of information. Hence, SMEs do not have adequate information on how to access the support structures. This solidifies the notion that 75% of owners or managers of SMEs are not aware of financial support structures or organizations (Agwa-Ejon & Mbohwa, 2015). The support organizations are very crucial to the development of the SMEs. These organizations include the National Youth Development Agency (NYDA), SEDA, Limpopo Business Support Agency (LIBSA), LEDET and Small Enterprise Finance Agency (SEFA) amongst others.

#### *3.6.1. National Youth Development Agency*

The National Youth Development Agency (NYDA) which was formed in 2009 has a similar objective as the SEDA as far as SMEs are concerned. The NYDA was established by a combination of the National Youth Commission (NYC) and the Umsobumvu Youth Fund

(Afolayan, 2014). Afolayan (2014: 20) and Ramohale (2015: 21) put it that the fundamental role of NYDA is to provide entrepreneurial skills to young people, assist the youth to realize their potential and provide access to financial resources.

The NYDA (2021) objectives include amongst others:

- To encourage young people, to start their businesses and assist them financially;
- To encourage entrepreneurship; and
- It offers mentoring and training for the young potential businesspeople

Include financial support, business registration, coaching and business plans *inter alia*. The owners of SMEs should take advantage of the services provided by the NYDA to enhance their business performance. This could also assist the managers to develop the necessary skills and knowledge for running and managing their businesses.

### 3.6.2. Small Enterprise Finance Agency

The immediate aim of the establishment of SEFA is to provide financial assistance to co-operatives and SMMEs respectively. The executive authority of SEFA is the Department of Small Business Development (DSBD). SEFA's major policy mandate is to help SMMEs, and cooperatives expand by providing financial assistance (SEFA, 2016; Sishuba, 2018). The significance of SMMEs in encouraging economic prosperity and increasing jobs is recognized in SEFA's policy objectives, thus accessibility to credit for SMMEs is critical (SEFA, 2018). A study by Sishuba (2018) shows that SEFA has formed agreements with a variety of commercial financial institutions in an attempt to carry out its strategic objectives. Identity Development Fund (IDF), Khula-Akwandze Fund, Anglo-Khula Mining Fund, Enablis Acceleration Fund, and Khula Credit Indemnity Scheme are among the programs administered by SEFA. According to SEFA (2016) and SEFA (2018) their purpose and objectives are highlighted below:

- Offering financial assistance or goods to wholesale and direct lending customers;

- Assist in the institutional development of financial institutions so that they can operate more efficiently Small and micro-enterprises, as well as cooperatives, can benefit from effective assistance;
- Forming strategic alliances with a variety of institutions for the long-term growth and support of small, micro, and cooperative businesses; and
- Ensure financial guarantees for small and micro businesses and cooperatives (SEFA, 2018).

### *3.6.3. Small Enterprise Development Agency*

Another significant government agency that helps SMMEs, particularly cooperatives, is SEDA. The newly created DSBD is in charge of overseeing the agency. The DSBD is responsible for putting the government's small business policy into action, designing and implementing a comprehensive and uniform nationwide delivery network for small business improvement, and integrating government-funded small business supporting organizations throughout all levels of the government (Sishuba, 2018). The SEDA is an organization that seeks to assist small businesses to sustain themselves in the long run. Its objectives are to promote the competitiveness and productivity of small businesses through the facilitation and coordination of projects and or programs. The organization offers various services such as financial assistance to small businesses, drawing up business plans, business registration, training and mentoring through the workshops (Maloka, 2013).

The agency oversees the national government's small business development policy. The agency is in charge of designing and implementing a standard national delivery network for small business development that is universally implemented throughout South Africa, integrating all government-funded small business assistance organizations from all levels of government (SEDA, 2016). Small business development support programs are designed and implemented by the agency to help small businesses become more competitive and sustainable. One of the small enterprise development agency's responsibilities is to promote entrepreneurship while also assisting in the formation of a favourable operating environment for small businesses (SEDA, 2016). Another role of the

agency is to promote, create, coordinate, and cultivate relationships across all levels of government, the business sector, and key stakeholders to help the agency achieve its goals (SEDA, 2016). These support organizations have a similar role to play in assisting SMEs, particularly now in the space of technological innovation. As such, SMEs should utilize such available organizations to make their business successful and salvage the impact of the 4IR.

SEDA is formed through the National Small Business Amendment Act 29 of 2004 (Afolayan, 2014). Therefore, according to Afolayan (2014), there are three packages offered by SEDA to support small businesses. The packages include; the SEDA business build package, SEDA business start package and SEDA business grow package. These packages are outlined according to Afolayan (2014: 30-31).

➤ *SEDA Start Package*

This package is established to help entrepreneurs and business people by providing the necessary tools and techniques required for the starting of businesses. The package includes the following elements:

- Planning for businesses
- Providing financial muscle
- Offering business assistance and support

➤ *SEDA Build Package*

This package is established to help business people with a thirst to get skills and promote or strengthen their businesses. This package encompasses the following:

- Business franchising
- Tender procurement
- Training and coaching
- Capacity building
- *SEDA Business Grow Package*



This package gives the potential entrepreneurs who want to expand their businesses from local national and international spheres, by offering the following assistance:

- Cooperative funding
- Strategies for business growth
- Business development opportunities

According to Nguyen et al (2013), as cited in Afolayan (2014), there seems to be no clear indicator of how small enterprises view new technology as a potential or a danger to their operations. Small enterprises, particularly new start-ups, are susceptible to instability and uncertainty, and micro enterprises in particular seem to accept modern technology without appropriate preparation, which has a negative impact on the effective adoption and application of technology that enhances business operations (Afolayan, 2014).

### **3.7. The Effect of the Fourth Industrial Revolution on Small and Micro Enterprises' Performance**

Generally, business performance by Ncube and Chimucheka (2019) cited in Mashavira and Chipunza (2021: 5) refers to how the business performs looking at its set targets and objectives. Business performance can be measured by using financial and non-financial measures (Mashavira & Chipunza, 2021). This means that the business' performance depends on financial resources. However, given that SMEs are already experiencing financial predicaments, it would be very cumbersome for such businesses to perform well or afford the modern cost of technology.

The 4IR plays a critical role in a space of business environment. Hence, its impact on SMEs is inevitable. The issue for businesses in the fourth industrial era is to encourage their intellectual employees to maximize their creative experience and capacity because, people have little influence regarding technologies or the chaos that the 4IR would cause (Xu et al, 2018). Equally, the 4IR is a phenomenon that creates a new normal in the business environment. It challenges SMEs to adapt to the new methods of technology and attempt to improve or pose a negative impact to SMEs that could retrograde the SMEs functions. However, one cannot disregard the previous technological industrial

revolutions that came with the great expansion in global economic growth and development. At the forefront of the then technological revolutions were multi-international corporations who were the driving force behind economic growth and development to the establishment of new technology.

The recent technological advancement in South Africa is under the spotlight wherein, in many ways the automation revolution is tantamount to the introduction of new machinery that completely changes the structure and operation of the businesses (Zhou, Liu & Zhou, 2015). Hence, such a radical technological revolution would greatly cause business inequalities between SMEs and multinational corporates. Perhaps, this is because multinational corporations have sufficient resources to keep abreast with modern technology. Therefore, the performance of big companies would always be greater than SMEs' performance due to the capacity, resources and ability to afford and maintain modern technology. However, under the current epoch of technology, each technological development is forced nor certain to be outdone (Booyens, Molotja, & Phiri, 2013; Schwab, 2016). This means that once multinational corporations develop new technologies and increase profits and speed of work through new machinery, the old technologies become irrelevant and valueless in the economy. New technology needs financial resources to maintain it. Thus, this causes the already poor financial SMEs to purchase and maintain such exorbitant costs of new technology (Agwa-Ejon & Mbohwa, 2015). Technology is always evolving, by the time SMEs attempt to keep up with technology would be late as the new technological invention would be developed. However, one deduces that the implication of the 4IR greatly impacts negatively on the performance of SMEs because they do not have adequate resources to maintain and afford new technological inventions.

Shava and Hofisi (2017) warn that this era of a much-anticipated technological enhancement would pose inevitable threats and distractions to business models and operations. A survey from WEF (2016) highlights that the 4IR scares a lot of people in both developing and developed countries. However, the 4IR does not only scare people, but it also scares SMEs in terms of adopting and complementing the growing technologies

in their business marketing strategies. SMEs find themselves in an unpalatable situation wherein they had to look for resources to complement the current technology, which on contrary, Maloka (2013) and Ramohale (2015) indicate that these SMEs do not have adequate resources to maintain their hegemony and have a competitive advantage in the business market. Therefore, one cannot be oblivious to the impact of the 4IR on the performance of SMEs. Hence, the performance of SMEs would be affected by the 4IR because of continuous inadequate resources of SMEs which makes it cumbersome to keep up with innovative and growing technologies. Although Vrchota et al (2019) indicate that the 4IR appears to be irrelevant to SMEs, one argues that the 4IR is very much relevant because, modern technology occupies and influences every sphere of life, be it in the economic system, business environment, social life and environmental aspects. The challenge experienced by SMEs is poor resources which hamper access to modern technology. Hence, Verbano and Crema (2016) cited in Vrchota et al (2019) insinuate that firms that have innovative approaches are able to integrate modern technologies into their activities, while businesses with poor resources (SMEs) would be left behind in the current debate on the 4IR.

Shava and Hofisi (2017) highlight that the businesses (SMEs) would not be spared because they have to invest in new skills development and ICT rather than employing the labour force. Against this point, SMEs are not at a point to invest in new skills and ICT because of their poor resources which would subsequently impact their performance. Perhaps the performance trajectory of SMEs is determined by the availability of resources. Coleman (2016) observes that the 4IR has profound impacts on businesses because of the divergence to the digital revolution, especially in the manufacturing businesses. Meanwhile, Barra (2016) reiterates that this new technological revolution is a radical process, particularly in the auto businesses. However, there seems to be a consensus amongst different scholars with a view that technological revolution could alter the production process radically but could be destructive to many people. Without being unfocussed, the performance of SMEs concerning innovative technology is tested because they appear to have poor resources to afford such a demanding technology. This subsequently, threatens the performance of SMEs in the era of the 4IR because big

business is dominating almost every sector of the business environment. Such an impact of the 4IR on the performance of SMEs is indicated by lower profits from SMEs, loss of customers and poor human and financial resources due to a high cost of technology. This is elaborated in chapter 4 below.

### **3.8. Summary**

In light of the above discussion, the literature has made it clear and vivid that the 4IR would change the normal workings of SMEs. Thus, the innovative ways brought by the 4IR would not completely eradicate the old way of workings, but it would simply complement if not substitute the old working methods of SMEs. This chapter suggested that South Africa in its entirety is not fully ready and prepared for the 4IR, specifically in areas of SMEs. While acknowledging the strenuous and concerted efforts made by the government in providing support to SMEs, they (SMEs) continue to experience challenges such as finance, skills, technology, and management. Meanwhile, the 4IR requires that such challenges faced by SMEs be at least curtailed to increase productivity, effectiveness and efficiency. Soni et al (2015) connote that the use of technologies such as laptops, computers and smart phones could be a key business strategy that could enhance the efficiency and effectiveness of businesses, especially now in the 21st century. The authors continue to opine that this could also assist businesses to conveniently reach their target market and curtail the costs of doing business. Moreover, the chapter identified the challenges faced by SMEs that could exacerbate such businesses to actively participate, afford and maintain the 4IR. That serves as a core gist and argument of the study that the impact of the 4IR on SMEs would be negative considering the challenges faced by SMEs. Much of the 4IR evidence proves that revolutions are good for development and capture the essence of change. Such revolutions are built on the past revolutions to address certain challenges. Unwin (2019) shows that most of the 4IR technologies are the extensions of the previous developments or revolutions.

## Chapter 4: RESEARCH FINDINGS, ANALYSIS AND INTERPRETATION

### 4.1. Introduction

This chapter presents the research findings, analysis and interpretation of the collected data from the respondents. It begins with the challenges and benefits of the 4IR and the demographic profile of the respondents. It further presents the types and characteristics of SMEs. This is followed by the impact of the 4IR on the performance of the SMEs which provides the gist of the study.

### 4.2. Challenges and Benefits of the Fourth Industrial Revolution

This section indicates the research findings on the challenges and benefits of the 4IR from the respondents. It commences with the demographic profile of the respondents. This is necessary to indicate who was involved in the study and shared their experiences, facts and thoughts about the 4IR and SMEs. The charts, tables and graphs are presented. Simultaneously, the interpretation and analysis of the figures are made to provide meanings and suggestions from the charts, graphs and tables.

Figure 4.1: Age Group of the Respondents

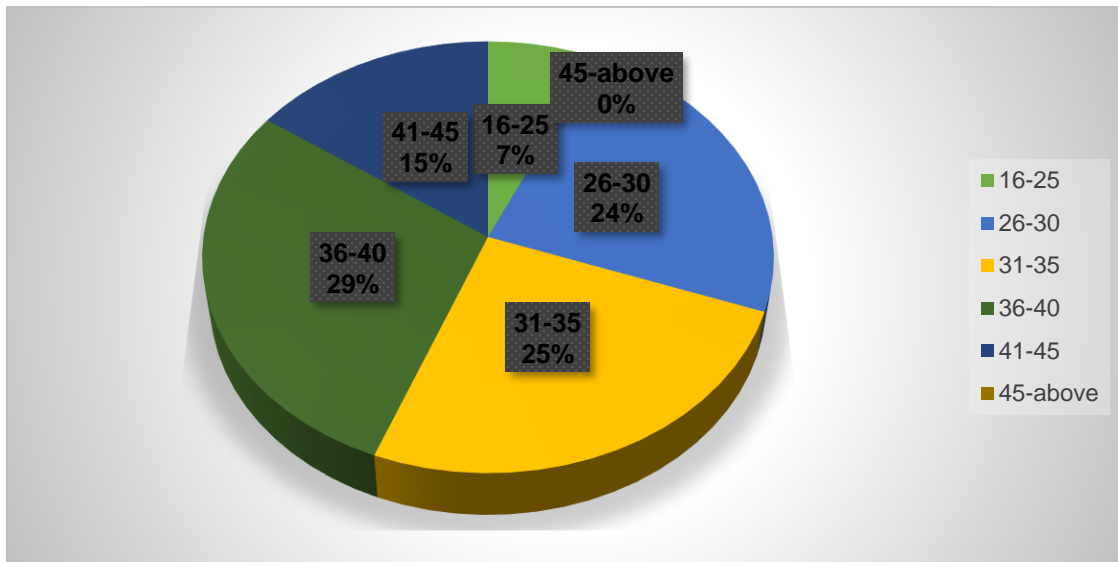


Figure 4.1 above indicate that most of the participants in the study were found to be young people with an overall total of 56% of the sample population group. This shows that young people are taking part in the local economy through the establishment of different SMEs, be it informal or informal. The formation of SMEs is one of their livelihood diversifications (Meso & Manamela, 2015). Meanwhile, their understanding and usage of technology in their businesses were very profound because almost all young people have access to smart technology. This also suggests that Mankweng Township has many young people who perhaps, could be seen as breadwinners in their families. This is followed by the adults with a total of 44% who took part in the study. Their experience and knowledge in the business arena are inevitable, especially in providing their viewpoints on how technology affects their business performance. This representation of young and old people owning businesses shows how zealous and dynamic they are in terms of seeking to provide solutions and enhance the local market.

**Figure 4.2: Gender of the Respondents**

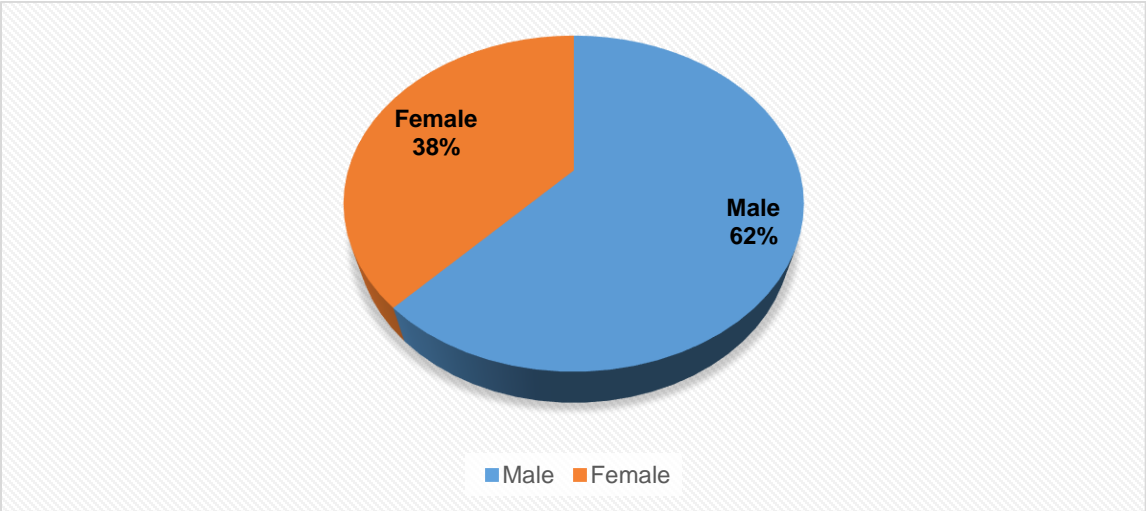


Figure 4.2 shows that men are well represented and active in the business fraternity with 62% representation in the study. The great enthusiasm of men and their zeal to achieve the set goals is what sets them apart from their female counterparts. However, it is concerning that females are still not well represented in the study with a representation

of 38%. Be that as it may, women in the country are less represented when it comes to business ownership. Even though there are great and sound initiatives to empower women to participate in all spheres of the economy, their reluctance, lack of support for one another and unwillingness to venture into businesses remains a huge concern.

**Figure 4.3: Educational Qualifications of the Respondents**

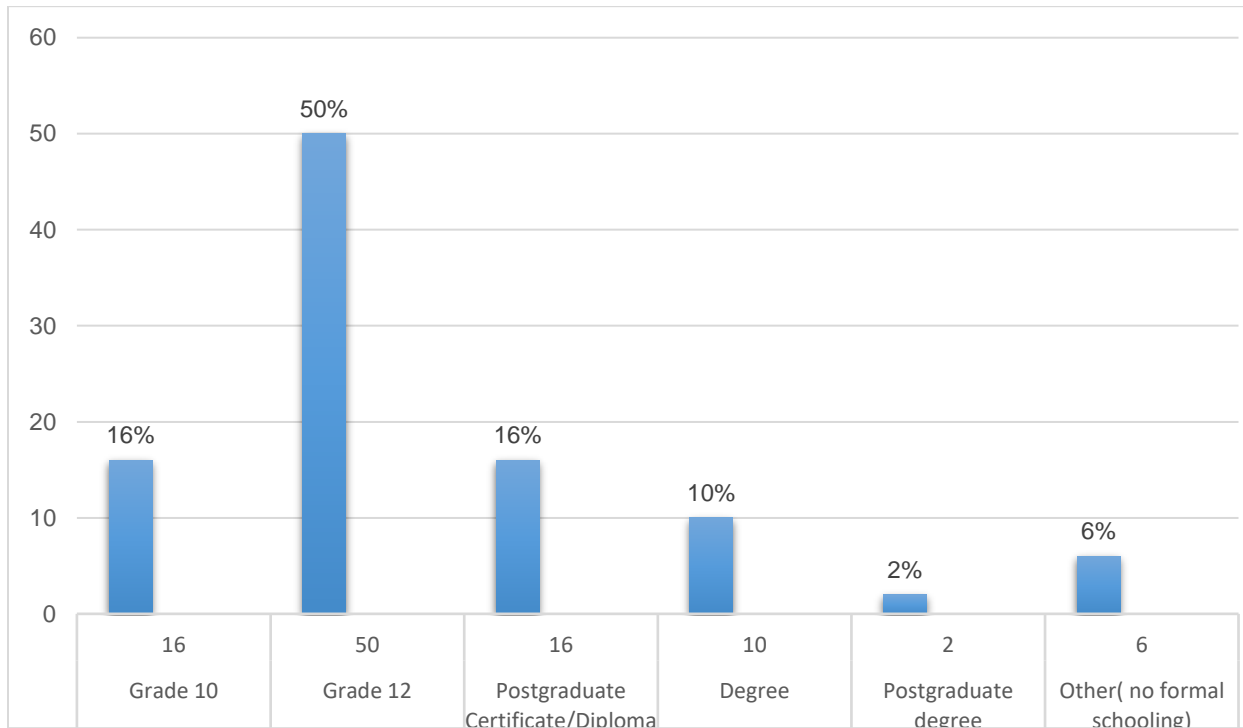


Figure 4.3 above shows the educational qualifications that the managers of SMEs have. The qualifications are necessary because they provide a basic foundation for SMEs. There is a misconception and perception that almost all SMEs owners do not have some form of education (illiteracy). Well, this is not the case in Mankweng Township. The results visibly demonstrate that most of the respondents have some form of education with the highest representation of 50% of the sample population being grade 12. Perhaps, the point is that after completion of grade 12, the respondents could not continue to tertiary education due to different reasons. One of those reasons could be a lack of information or finance. As a result, the respondents decided to establish small businesses for survival. However, Soni et al (2015) in their study found that 73.2% of SMEs owners do not have

educational higher qualifications. Be that as it may, an overall total of 28% of the sample population has completed their tertiary qualification and postgraduate. Therefore, it can be concluded that in the study area, both young and old respondents have some formal education although only 16% managed to pass grade 10. Moreover, the 'other' with a representation of 6% of the sample population indicated that they do not have formal educational qualifications.

#### 4.2.1. The Perceptions of the Fourth Industrial Revolution

This theme was established to get the views from the respondents about the 4IR. As literature highlights that the 4IR has to do with the IoT, CPS, additive manufacturing, 3-D printing and digitalization; it was necessary to test such perceptions from the participants. This is because the 4IR is recently becoming a fast-growing phenomenon in changing the operations of businesses. However, respondent X from the surveyed individuals indicated that *"The 4IR is used by businesses to increase profits and production"*. This generally means that the 4IR benefits businesses in ensuring effective production. *"The 4IR is a massive advancement technology which is quite faster than it used to be 10 years back"* this is a quote from respondent Z, highlighting the perceptions of the 4IR. A similar perception is further extended by respondent Y who indicates that *"Technology can bring a change in a business because everyone has a cell phone and a TV, and advertisement can be easy"*. This is backed up by respondent B who indicated that *"This fourth industrial revolution is leading the world to more productive in a small/short time"*. Similarly, respondent C indicated that *"The fourth industrial revolution is an advanced artificial intelligence technology because it becomes a modern life, it is fast and recommendable"*. These are a few ideas from the sampled population group highlighting their thoughts about the 4IR. Hence, a successful business transformation requires a deepened comprehension of the 4IR, its technical elements, its challenges, and benefits and how it would operate in the business realm. The perceptions of the respondents are validated by Prisecaru (2016), Guoping et al (2017), Kang (2017) and Wisskirchen et al (2017) who proffer that the 4IR is efficient, effective and improves a considerable amount of savings and reduces costs.



**Figure 4.4: The Effectiveness of the Fourth Industrial Revolution in Small and Micro Enterprises**

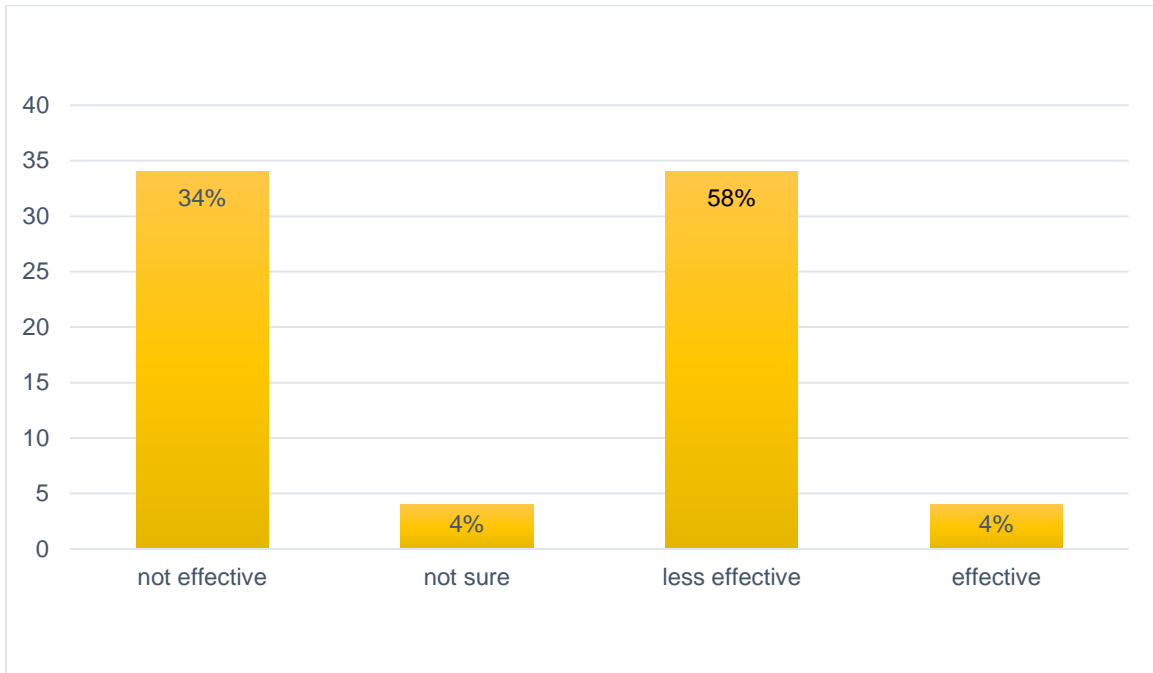


Figure 4.4 shows the effectiveness of technology (4IR) within SMEs. In this case, effectiveness means how technology or the extent to which it is being used in the business. It refers to the usage of new and old machines, the internet, manufacturing, computers, nanotechnology, 3-D printing and robotics amongst others. These are the elements that are used to determine the effectiveness of technology with SMEs in the study area. Given that most of the townships in South Africa are characterized by formal and informal SMEs, the effectiveness of technology remains a huge concern. Mankweng Township is no exception. However, 58% of the respondents indicated that technology in their business is less effective. This means that most of SMEs are still using old technologies, computers and the internet *inter alia* which must be updated and changed to new and innovative technologies. The SMEs have analysed their state of technology despite the outdated technology because their technological elements still fall under the 4IR. Through the researcher's observations, most SMEs are not technologically advanced in the sense that smart, innovative and creative technology is not being used in SMEs. Meanwhile, 34% of the sample population showed that the level of technology (4IR) is not effective. This included SMEs that do not solely rely on technology to run their

business even though the technology is used, it is still not that effective. Such SMEs include street vendors, car wash, farming, poultry, childcare centres and driving schools amongst others.

**Figure 4.5: The use of Cyber-Physical Systems and Internet of Things to enhance the Functioning of the Business**

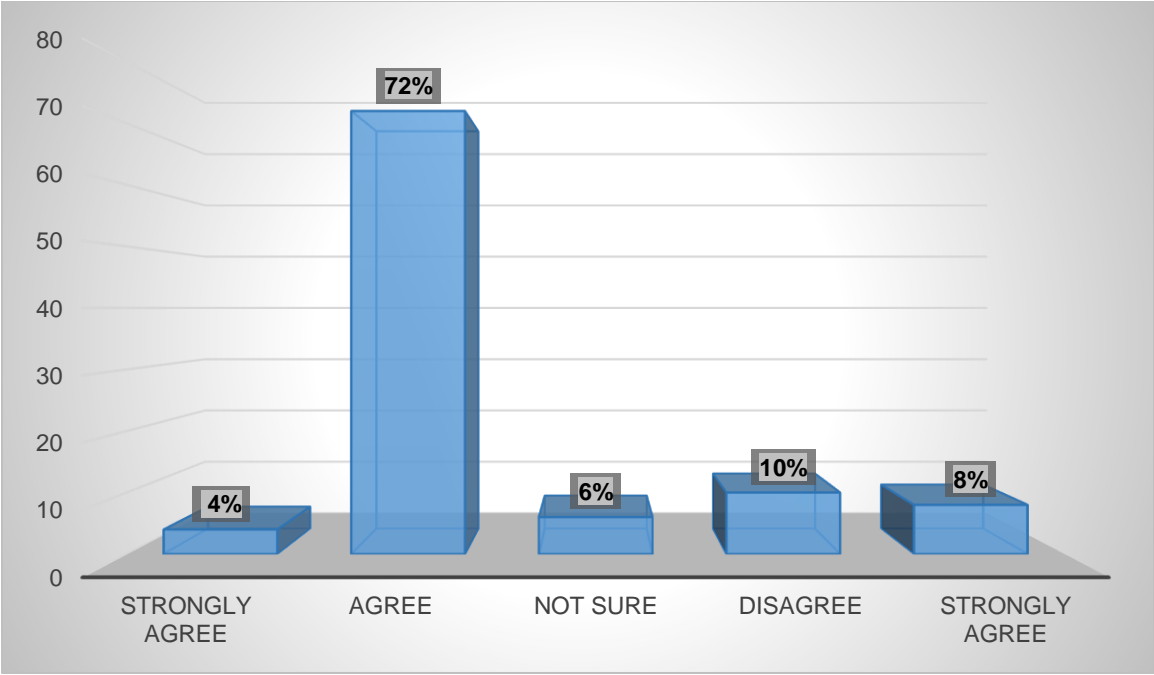


Figure 4.5 above demonstrates the use of CPS and IoT in relation to enhancing business relations and connectivity between the business and the customers. The researcher deemed it necessary to probe the relationship between the customers and the business. The IoT has developed at a very fast phase since the early 2000s to date. The use of the internet has grown rapidly to a point where almost every young and old person has access to either a smartphone/device or computers. Most of the people and businesses are connected via virtual platforms (CPS) to communicate with one another (Kang, 2017; Luff, 2017). Therefore, most of the respondents with a sample population of 72% indicated that the CPS and IoT enhance the connectivity of the business and its stakeholders. The suggestion from this sample group is that the participants have access to smart mobile phones to be in contact with their stakeholders via online platforms. Hence, from such

phones and computers, participants can install apps such as WhatsApp, Facebook, Twitter, Email, Zoom and Skype to name a few. The researcher, through observations, suggests that the most dominant and convenient tool to connect with stakeholders is social media, particularly WhatsApp. Contrary to the 72% sample population group, a total of 18% of the sample population group is against the idea that CPS and IoT enhance the relationship, connectivity, and coordination of the business. This includes the businesses that entirely do not use technology and are mostly run by old people such as street vendors and shoe repairs. Therefore, the conclusion is that most of the respondents have access to smart devices to keep the stakeholders abreast of any business developments.

**Table 4.1: The Benefits of the Fourth Industrial Revolution**

	Enhance productivity	Efficiency	Improve savings	Reduce costs	Enhance coordination	Flexible work environment	Improve connection with customers	CPS & IoT
<b>Strongly agree</b>	22%	34%	32%	28%	34%	14%	50%	34%
<b>Agree</b>	18%	42%	36%	42%	40%	38%	28%	38%
<b>Not Sure</b>	12%	2%	12%	6%	8%	26%	6%	10%
<b>Disagree</b>	24%	12%	10%	16%	10%	14%	12%	6%
<b>Strongly Disagree</b>	24%	10%	10%	8%	8%	8%	4%	12%
<b>TOTAL</b>	100%	100%	100%	100%	100%	100%	100%	100%

Table 4.1 present the benefits of the 4IR in businesses. Guoping et al (2017) and Kang (2017) highlight that the 4IR is critical in ensuring the smooth operation of businesses. Therefore, a total sample population group of 48% indicated that the 4IR does not improve productivity. That sample population group included the businesses that do not necessarily produce anything. Such businesses incorporated hair salons, driving schools, medical services, shoe repairs, internet cafés and street vendors. Meanwhile, 30% of the total sample group shows that technology enhances productivity in their businesses. This

group comprised of businesses such as farming or agriculture, carpentry, traditional beads, clothes sewing or manufacturing, bakery and catering to name a few.

The 4IR does not only improve the production process but also ensures the efficiency of the business. Efficiency means that there is less wastage of economic resources. The results from the survey indicated that the majority of respondents with a total representation of 76% agree that the 4IR enhances efficiency in their businesses. This means that machines or computers or any other technological elements, be it old or new are used to reduce wastage and enhance efficiency. On contrary, 22% of the total sample population group do not regard and recognise technology as a way of enhancing efficiency. The researcher, therefore, suggests that this sample population group does not completely rely upon the use of technology, but mostly relies upon the use of human resources. According to the findings, these are labour-intensive businesses such as hair salons, shoe repairs and car washes amongst others. However, it can be concluded that most businesses use technology to ensure efficiency, especially the use of the IoT.

With the usage of technology in businesses, one can be able to minimise costs and improve savings. In that, Wisskirchen et al (2017: 14) make an analysis that the usage of robots and largely machines are cheaper in China than a worker. This is simply because the machines, robots and computers cannot be ill, take a monthly or annual leave, have children and to a larger extent, go on strike for the increment of wages or salaries (Prisecaru, 2016; Kang, 2017). The views of the aforementioned authors corroborate the findings of this study. Because the majority of the respondents in the above table indicated that the 4IR reduces costs with 70% of the respondents in favour of the idea and 68% of the respondents agreeing that the 4IR technologies enhance savings.

The CPS and IoT are also some of the critical elements of the 4IR. Therefore, the significance of such elements is to ensure that the business and its stakeholders find solace in the use of digital technologies. This means that the use and connectivity of the business and other stakeholders in a more digital space reduces physical trading. Rahman and Rahmani (2017) cited in Erboz (2017) highlight that the IoT is the next

technological revolution that will rely on cloud-based technologies to provide alternatives for computing, analytics, and other tasks. IoT's primary goal is to link the Internet by gathering data from tangible items (Erboz, 2017). Computers or other advanced gadgets make operational decisions by gathering data, hence, company operations are made quicker and more integrated by the use of IoT, and they also get a competitive edge (Erboz, 2017). Therefore, most of the respondents with an overall total of 72% indicated that the IoT is one of the benefits to enhance business connectivity. This is also supported by a total of 78% of the respondents who showed that the 4IR enhances connection with customers. Donner and Escobari (2010) support such findings by acknowledging that the 4IR provides an opportunity for businesses with the ability to connect with their customers more conveniently. Through the researcher's own observations, at the centre of such business connectivity with stakeholders is social media platforms. This, however, suggests that most of the respondents have access to smart devices to socialize and connect with their stakeholders through social media platforms such as WhatsApp, Facebook, Instagram, TikTok and E-mails amongst others. Therefore, some of these social media platforms emerged in the current period of the 4IR.

**Table 4.2: The Challenges of the Fourth Industrial Revolution**

	New skills	High cost & maintenance	Infrastructure development	Artificial intelligence	New equipment	Unemployment	Data security
Strongly agree	16%	18%	14%	-	42%	4%	2%
Agree	22%	50%	14%	2%	36%	4%	2%
Not sure	14%	-	10%	34%	8%	38%	4%
Disagree	34%	16%	44%	50%	6%	44%	20%
Strongly disagree	14%	16%	18%	14%	8%	10%	72%
Total	100%	100%	100%	100%	100%	100%	100%

As table 4.1 presented the benefits of the 4IR, table 4.2 above shows the challenges associated with the 4IR. The researcher looked into both challenges and benefits of the 4IR to circumvent or eradicate any weakness that may occur. This was done to cover any

missed aspects of the 4IR and provide the gist of what 4IR is and its pros and cons. Hence, it is always advisable to look into both sides of the story. Therefore, from a sample population, a total of 48% indicated that the 4IR does not pose any threat or challenge to their business. These findings refute literature by Prisecaru (2016) and Penprase (2018) who highlight that the 4IR requires the skills and knowledge on how to use certain elements as technology evolves. This might be because of different contexts and business types. This may also mean that the respondents already have skills on how to use certain technological elements in their businesses. Meanwhile, a total of 28% population group indicated that the 4IR needs new skills.

As the standard of living is on the rise, so does the cost and maintenance of technology. The results from the sample population with a total of 68% indicated that the cost of technology affects their business. These are mostly businesses such as medical services, bakeries, catering, panel beaters and internet cafés to mention a few. This is essential because they must buy accessories associated with the devices/machines and keep such machines updated for smooth running. Moreover, 30% of the sample population group do not think that the high cost and maintenance of the 4IR affect their business. The respondents from such a sample population group are from labour-intensive businesses such as hair salons, car washes, traditional beads and arts and street vendors. Be that as it may, the conclusion that may be drawn from the above analysis is that majority of the respondents share similar sentiments that the cost and maintenance of technology have an impact on their businesses.

Given the nature and context of the study, AI is not familiar to almost all the SMEs in the township. The respondents are not aware or do not even use AI in their businesses. The AI means the use of computerized robots or programmed machines to do certain jobs which is equivalent to a job that could be done by a human being (Schwab, 2016). Therefore, the AI is not a challenge to the SMEs in the township because they do not use it. However, most of the respondents with a total of 78% of the sample group indicated that the current technology requires new and creative machines. This is because some of the SMEs are still using old machines which are often stuck and encounter problems.

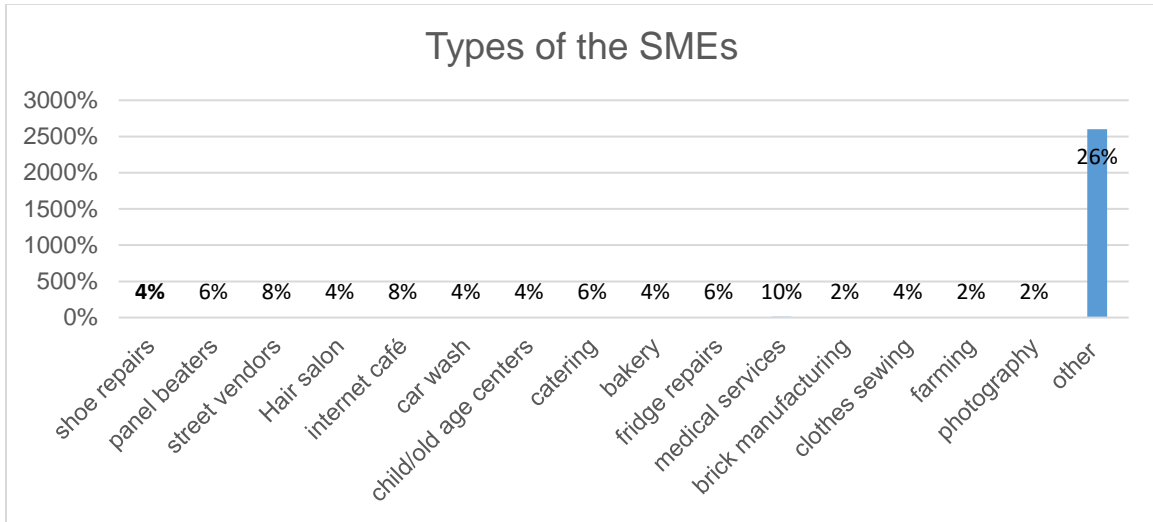
New equipment requires knowledge, skills and training because the current devices or machines are complex and sophisticated. Moreover, 14% of the respondents indicated that new equipment is not a challenge. The suggestion here is that the population group does not need or rely largely on the use of machines.

As it has been highlighted in the literature that data security is one of the challenges that can affect the performance or operations of the business, it is not the case in the study area. Data security has to do with information that is on the cloud that could be susceptible to being hacked by external forces (Parry, 2018). Therefore, 72% of the respondents dismissed the fact that data security is a challenge to their business. This is because they do not keep their business information on the cloud. This includes businesses such as hair salons, traditional beads, car washes, driving schools and street vendors to name a few. The suggested conclusion is that these businesses do not have official websites that could be hacked.

#### **4.3. The Types and Characteristics of Small and Micro Enterprises**

It is very crucial to know the types of SMEs that are affected and influenced by the inception of the 4IR. Knowing the types of SMEs provide responses from where the researcher has collected data. Many types of SMEs occupy the market in the study area. Such types are coupled with their characteristics which are illustrated, analysed and interpreted below.

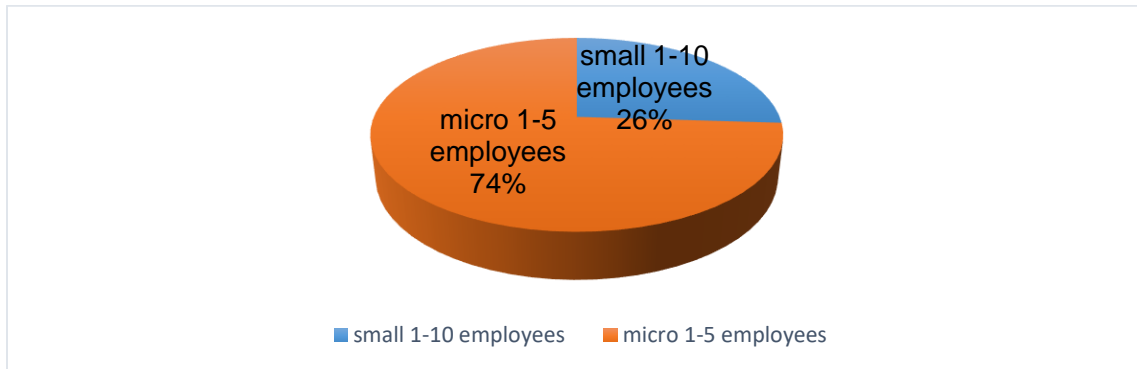
**Figure 4.6: Types of the Small and Micro Enterprises**



Different SMEs play a role in the local economy and make the market an interesting environment. The role of both formal and informal SMEs must be recognised in the development of the local economy because they both contribute to the nominal growth of the local economy and national economy. This study revealed that there are myriad and various forms of SMEs in Mankweng Township as per the above figure. Major findings from the survey are that a sample population group of 26% chose the 'other' in the questionnaire survey. This option of 'other' included SMEs such as traditional beads and arts, driving schools, carpentry, poultry, aluminium window and door frame making, spaza shops, chisa nyama and dry cleaning amongst others. These different types of SMEs are a diverse representation of livelihood diversification for many people in the study area.

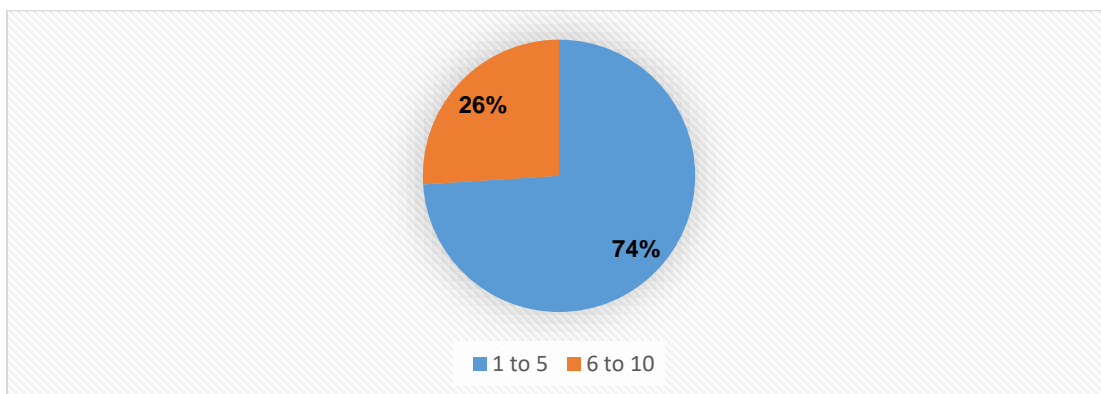


**Figure 4.7: Categorization of Small and Micro Enterprises**



The researcher wanted to understand and attempt to validate the views of Bhorat et al (2018) who categorize SMEs as per their size Small (5-9) and Micro (1-4). From the survey, the respondents with a representation of 74% indicated that their businesses are categorised as micro-businesses and 26% of the respondents indicated that their businesses are categorised as small. These findings corroborate the views of Bhorat et al (2018) who highlight similar perceptions. The conclusion that could be drawn from the above figure is that the study area is characterized by the majority of the micro-enterprises.

**Figure 4.8: Number of People Working in the Business**



This figure validates or supports the previous figure by highlighting the number of employees working in each business. Therefore, SMEs that are categorized as micro

employed 1-5 employees. From the researcher's own observations, such businesses are family-owned businesses. It is highly unlikely that these businesses could hire more than 5 people. Such businesses included car washes, street vendors, shoe repairs and internet cafés to name a few. However, the small businesses employed 6-10 employees. This includes businesses such as medical services, farming and poultry amongst others.

**Table 4.3: Characteristics of Small and Micro Enterprises**

	Informal Unregistered	Formal Registered	Self- governance	Market area	Cooking & baking	Fixing cars	Internet services	Teaching and learning	Shoe services
Strongly agree	60%	40%	60%	66%	18%	6%	8%	4%	2%
Agree	-	-	40%	34%	6%	2%	4%	-	2%
Not applicable	24%	44%	0%	0%	64%	72%	72%	82%	84%
Disagree	2%	-	-	-	4%	6%	2%	4%	4%
Strongly disagree	14%	16%	-	-	8%	14%	14%	10%	8%
	100%	100%	100%	100%	100%	100%	100%	100%	100%

The table above shows the percentages of SMEs that are registered. The table clearly shows that most of SMEs which are represented by 60% are in the informal sector. As this is the case in most of the township areas in South Africa, Mankweng Township cannot be side-lined. However, the significance of informal SMEs is critical because they provide essential services or goods to the local people in a more convenient way. These types of businesses do not pay taxes or even follow labour legislations. The conclusion is that the majority of SMEs in the study area are not formally registered.

It also reveals that only 40% of the respondents indicated that their businesses are registered. This means that the businesses operate within the parameters of the law. The majority of such businesses include medical services, water providers, food and catering businesses. Registered businesses mean that they have a business plan and a business

account. Therefore, few respondents have registered their businesses and the majority of them as indicated above in the table operate in an informal sector.

The managers/owners of SMEs are inextricably linked to their businesses. They are the ones who have a final say and the decision regarding the business rests with them. Hence, the owners of SMEs cannot be separated from their businesses. Equally, the findings from the study show that all the owners of SMEs run their businesses. No one is running their businesses on their behalf. Despite being registered or otherwise, all the businesses (SMEs) are run by the owners.

The market area refers to the specific location in which businesses operate. Through the researcher's observations, most of SMEs exist only in a fixed location. They are not diverse or have branches in other areas. Hence, a sample population group of 66% stood firm on the ground that their businesses are only to be found in Mankweng Township. This suggests that generally, there is a lack of expansion from SMEs because they are limited to one area. However, a sample population group of 24% indicated that their businesses are seen through cooking and baking. From the survey, this included SMEs such as chisa nyama, bakery and catering amongst others. Moreover, a total of 8% of the respondents indicated that their businesses are characterized by fixing cars. These are indisputable and dominant businesses such as panel beaters who are by nature fixing cars.

The respondents with a total representation of 12% indicated that their businesses are seen through internet services. This specifically included businesses such as internet cafés. The nature of these businesses is to offer services such as copying, printing, scanning, typing, email, faxing and laminating *inter alia*. Only 4% of the target population indicated that their businesses are seen through teaching and learning. This included childcare centres. Meanwhile, a total of 4% of the sample population group indicated that their businesses are characterized by offering shoe services. The suggested conclusion that could be drawn from the above table is that most of these SMEs vary because of the

services they offer to the people. This diversity of businesses is necessary to enhance the agglomeration of economies in the local area and improve economic development.

**Figure 4.9: The Rationale for Establishing Small and Micro Enterprises**

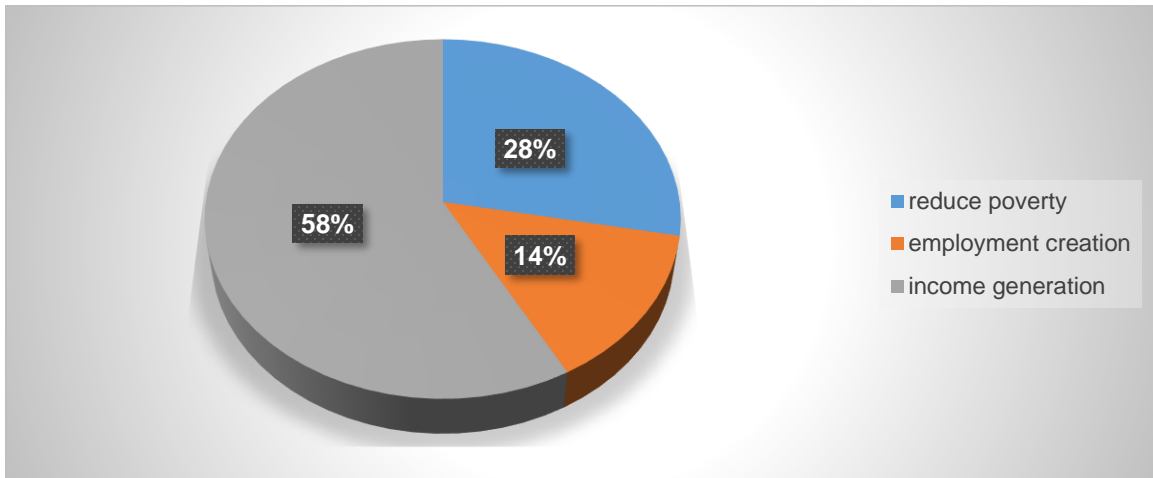


Figure 4.9 shows the reasons why individuals establish SMEs. Studies conducted by Maloka (2013), Mutoko, (2014) Meso and Manamela (2015) and Ramohale (2015) reveal that SMEs play a fundamental role in employment creation, poverty reduction and income generation. Their views and results complement the results of this study. Because the major findings from this study are that 58% of the respondents indicated that they formed SMEs to generate an income. This suggests that SMEs are part of their livelihood diversification and an essential means for survival. That ultimately corroborates the 28% of the respondents who indicated that they established SMEs to reduce poverty levels. Lastly, only 14% of the respondents highlighted that they formed SMEs to create employment.

#### 4.3.1. The Significance of Small and Micro Enterprises

This theme was established to get the views from the respondents about the significance of SMEs. The literature indicated that SMEs have a fundamental role to play in reducing poverty in most countries. Hence, some of the businesses are established for the purpose of livelihood diversification and poverty reduction. From the sampled population group,

there is a general perception that SMEs are a source of income generation and reduce absolute poverty. Respondent X indicated that *“I am able to buy food for the family because of some of the money I get from the business”*. While respondent Z indicated that *“I give money from the business to my kids for eating at school”*. These are some of the ideas from the respondents regarding the significance of SMEs. Additionally, respondent Y indicated that *“I survive from the money I make from my business”*. Respondent A indicated that *“I already employed 3 people”*. This shows the zeal and zest of an individual who seeks to uplift other people in the community to have a better living standard. The sentiments of the respondents corroborate the ideas of Maloka (2013) Manamela and Meso (2015) and Ramohale (2015) who have rubberstamped the fact that SMEs are a driving vehicle toward reducing poverty and income generation. The authors also indicate that SMEs spearhead local economic development. The table below shows the challenges faced by SMEs.

**Table 4.4: Challenges of Small and Micro Enterprises**

Challenges of SMEs									
	Lack of finance	Lack of information	Poor skills	Illiteracy	Unqualified personnel	Lack of planning	Poor access to markets	Cost of technology	Poor infrastructure
<b>Strongly agree</b>	62%	24%	-	4%	-	28%	52%	24%	38%
<b>Agree</b>	20%	28%	6%	14%	20%	34%	18%	42%	14%
<b>Not sure</b>	-	14%	8%	4%	16%	4%	-	8%	2%
<b>Disagree</b>	18%	30%	64%	62%	48%	24%	16%	16%	10%
<b>Strongly disagree</b>	-	4%	22%	16%	16%	10%	14%	10%	36%
<b>Total</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%

The table above indicates the challenges encountered by SMEs. The biggest highlight from the table above is the lack of finance. Lack of finance is key in ensuring and determining the performance of the businesses. Therefore, a total of 80% of the respondents indicated that their businesses experience financial quandaries. These are

mostly informal businesses. Hence, access to finance and having financial resources is the only way that a business could grow and be sustainable. As per Chimucheka (2013) limited access to finance is the downfall of businesses. Sishuba (2018) lengthens the point shared by Chimucheka (2013) by indicating that most SMEs are not aware of the available financial organizations. However, this study corroborates the sentiments of Mutoko (2014) who highlights that most SMEs are financed through their own pockets and family money. Most of these businesses do not have a business bank account (Burrows, 2013). This is corroborated by the BDO who also highlighted that the office of the enterprise development under the LED unit also experiences financial/budget constraints to assist SMEs. Moreover, the BDO also indicated that the enterprise development office does not have enough funds allocated to their office to run the exhibitions/programs. Therefore, the conclusion is that most of SMEs in the study area lack financial resources and subsequently perform poorly because sometimes money from the business is used for personal means. Lack of financial resources limits opportunities, expansion and performance of SMEs.

This study also found that lack of information is one of the challenges for SMEs. In that, 52% of the respondents indicated that they lack information. This lack of information includes information regarding business registrations, access to finance, organizations that support SMEs or even information that may benefit their business. This also refers to not being aware of information regarding the use of current technologies and how such technologies could improve their businesses.

Skills and knowledge are the foundation to ensure the success of the business. The sample population group of 86% do not believe that poor skills are a challenge to their businesses. This suggests that most of the respondents have skills coupled with their experience in running a business. This is also corroborated by their level of qualifications because most of them have completed grade 12. However, it does not necessarily mean that after completion of grade 12, respondents have business skills. But the suggestion is that the respondents know how to read and write and perhaps have some business

ideas. Hence, Emizie (2017) concurs that acquiring formal education is an ingredient and a means of successfully managing businesses.

Access to the market is yet another way that could improve the performance of businesses. It could enhance the sales of the businesses, explore new opportunities and greater business expansion. The table above indicates that one of the predicaments of SMEs is access to markets. 70% of the respondents do not have access to markets. This means that there is a lack of business expansion, and poor marketing skills and knowledge. This is supported by Sishuba (2018) who indicates that most SMEs lack access to the market. This limits the development and growth of SMEs. However, at the centre of poor access to the market is a lack of finance in most SMEs as it has been shown in the table above. Therefore, poor access to the market affects the performance of the SMEs negatively because they cannot grow, hence, they are confined to their market area.

As technology evolves and expands, its costs also increase. As per the above figure, 66% of the respondents indicated that the cost of technology is a challenge in their businesses. This is essentially because the production of new technologies is complex and requires many additional resources. The fact is that the current technology is exorbitant. This is because already many SMEs experience financial obstacles and cannot afford or maintain the growing technology as per their business needs and demands. However, 26% of the respondents indicated that the cost of technology is not a problem. The suggestion is that this population group does not entirely rely on technological elements to run their businesses.

#### 4.3.2. The Awareness of the Programs/Projects to Support Small and Micro Enterprises

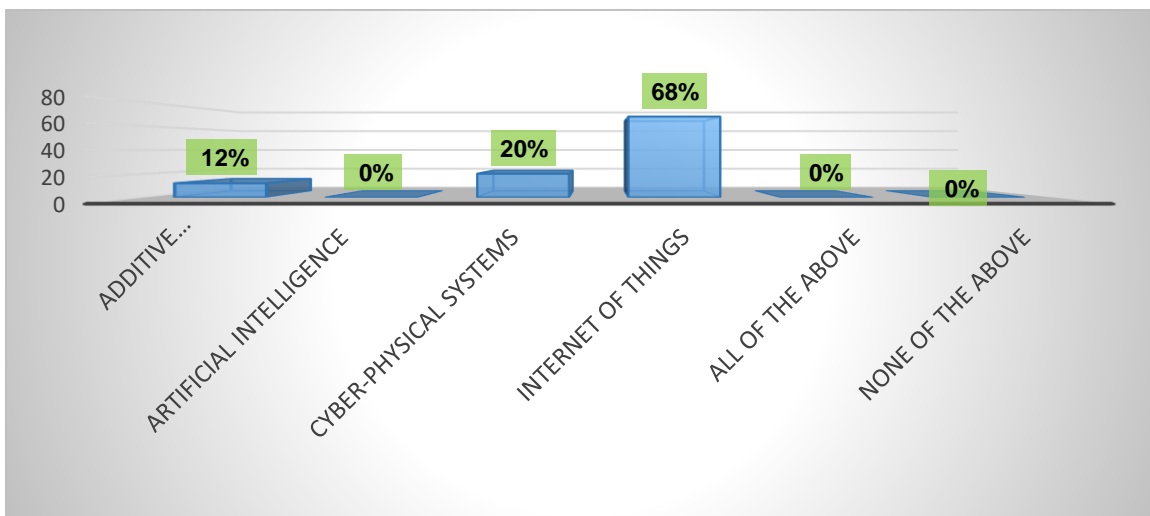
This theme was established to get information from the respondents regarding the programs that support their businesses. It was observed and found that most of the respondents were not aware of the projects or programs to assist SMEs. This could be referred to as a lack of information. Most of the respondents indicated by “N/A” that they do not know any of the support programs and projects. However, respondent X indicated

that “I know that the government assists the businesses”. Generally, respondent X knows that the government has a critical role to play in supporting small businesses. Moreover, respondent Z indicated that “I only know NYDA”. As highlighted in the literature, the NYDA is an agency that supports young entrepreneurs who have business ideas to put them into practice. The agency also provides financial support, mentoring and coaching to small businesses. Other respondents indicated organizations such as Industrial Development Corporation, IDC, SBA and IFC amongst others.

#### 4.4. The Impact of the Fourth Industrial Revolution on the Performance of Small and Micro Enterprises

This theme presents the impact of the 4IR on the performance of SMEs. It shows the results of the respondents. Businesses will be able to transform data into information courtesy of the fully developed 4IR. Big data enables the handling and understanding of enormous amounts of information for commercial reasons, which is essential for developing corporate action plans or making choices. More generally, the 4IR allows company owners and entrepreneurs to reconsider marketing strategies that are more beneficial, long-lasting and integrated with other facets of the market. Below are the relevant subthemes which were necessary to analyse data and draw relevant inferences thereof.

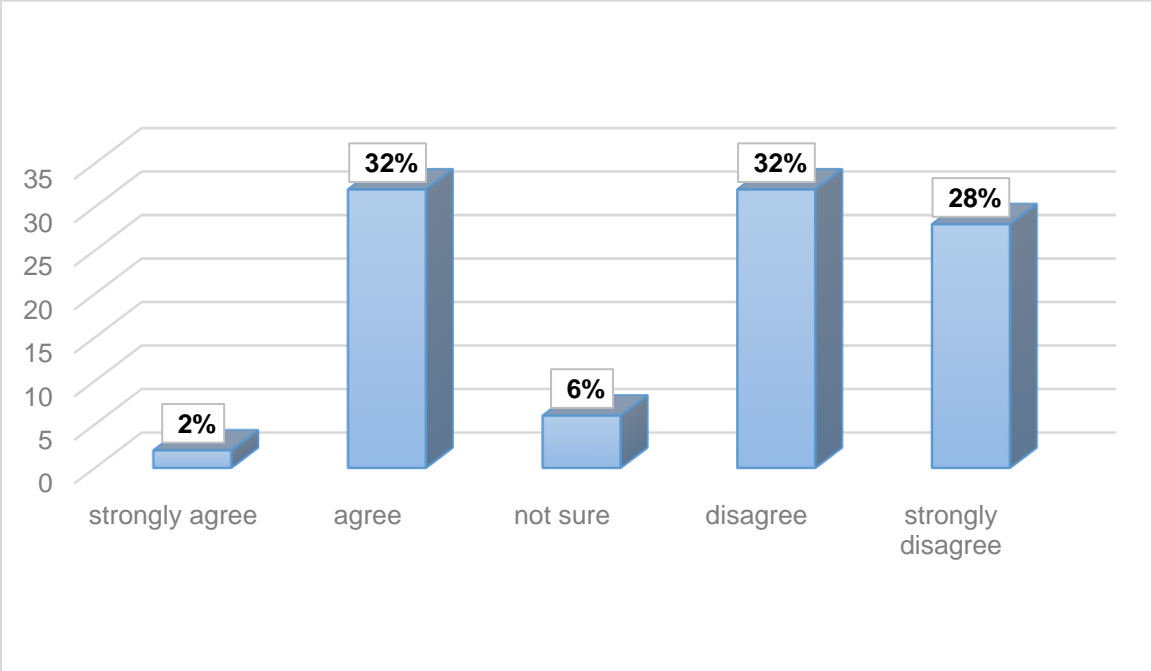
**Figure 4.10: The Affordability of the Fourth Industrial Revolution Technologies**





The figure above shows the technological elements that SMEs could at least afford. Most of the respondents with a sample population group of 68% indicated that they can use the internet. This is because most of the respondents have access to smartphones or laptops to access internet services. About 12% of the respondents indicated that they can at least afford the process of manufacturing. This included businesses that are involved in production such as brick manufacturing, catering and bakery amongst others. Be that as it may, 20% of the sample population group indicated that they cannot afford any of the technologies mentioned in the figure above. This could be due to financial challenges. This included businesses such as street vendors which are mostly run by adults. However, the gist of the findings is that most of the respondents can afford the use of the internet to run their businesses. However, the next figure below shows the affordability of the cost and maintenance of the 4IR.

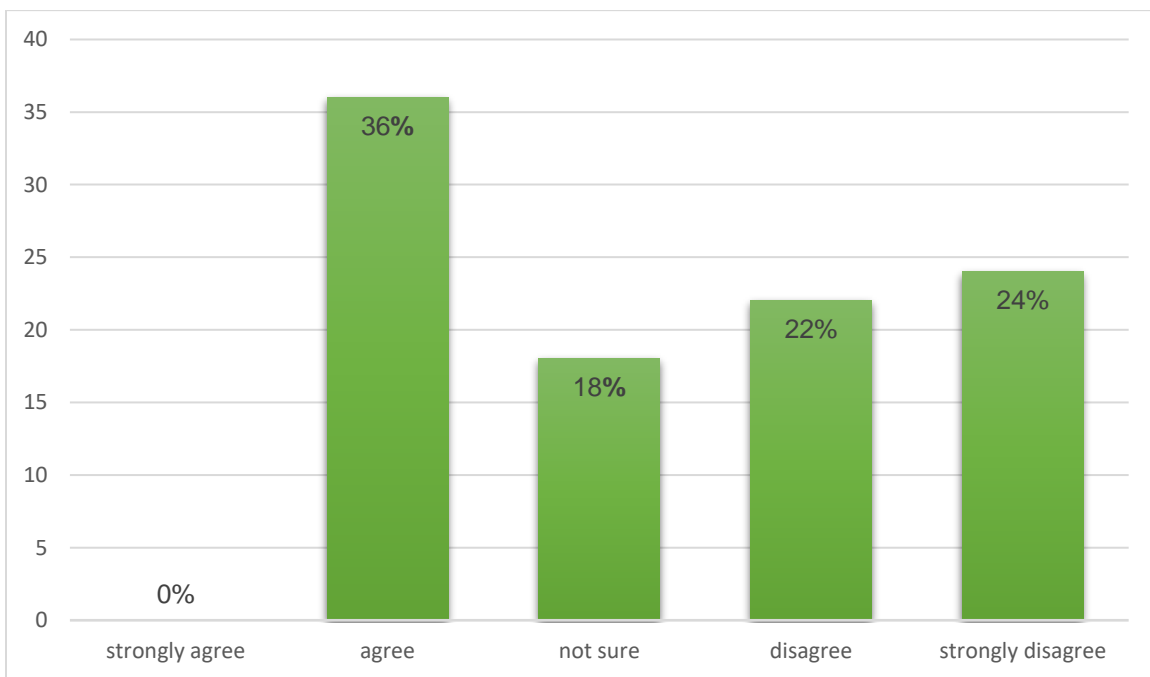
**Figure 4.11: The Cost and Maintenance of the Fourth Industrial Revolution**



This figure attempts to show the affordability of the 4IR. The idea is that most of the current technological elements are expensive. As a matter of recapitulation, most of the

SMEs in the study area face challenges such as finance and lack of necessary skills. Therefore, the affordability of the cost and maintenance of the 4IR technologies is likely to be difficult. Hence, most of the respondents represented by a total of 60% in the figure above indicated that they cannot afford the growing cost and maintenance of technology. On the other hand, 34% of the respondents indicated that they could afford the cost of technology. These are businesses that do not completely experience financial predicaments. However, key findings from the study are that most SMEs cannot afford the latest (4IR) technology. The assumption is due to poor financial resources and the high cost of the 4IR technologies. Hence, this hinders the performance of SMEs.

**Figure 4.12: The Skills and Knowledge Compatible with the Fourth Industrial Revolution**



This figure seeks to show the skills and knowledge that the respondents have to complement the 4IR. Such skills include being computer literate, knowing how to operate the latest machines, AI, CPS, bio and nanotechnology skills and 3-D manufacturing skills (Schwab, 2016; Parry, 2018; Penphrase, 2018). The figure above revealed that a total of 46% of the respondents do not have the necessary skills and knowledge regarding the latest 4IR technologies. Meanwhile, 18% of the respondents are not sure. On one hand,

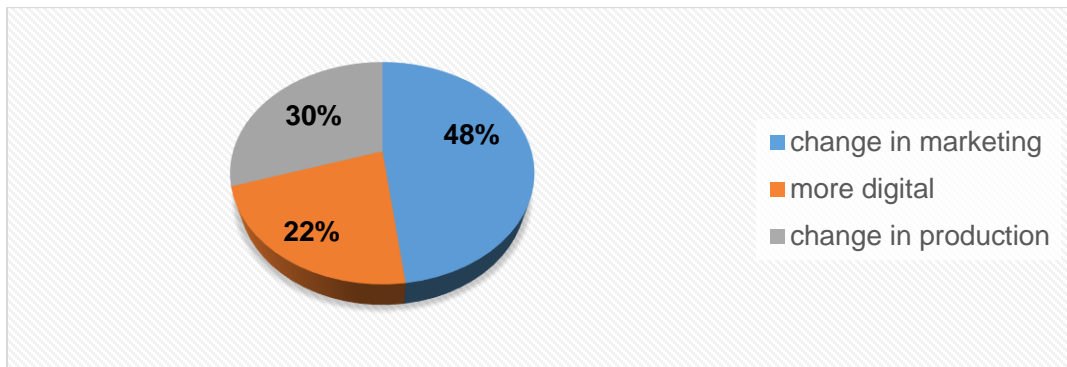
36% of the respondents indicated that they have skills and knowledge regarding the 4IR technologies. This mostly included respondents who have access to internet facilities and smart devices to demonstrate that they have some information regarding 4IR technologies especially the use of the internet.

#### 4.4.1. The Programs or Initiatives taken by Small and Micro Enterprises

This theme was established to find insights into the programs or initiatives that the SMEs have undertaken to enhance their skills and knowledge regarding the current and growing technology (4IR). Numerous technical advancements have been made as a result of changing consumer patterns. Geissbauer, Vedso and Schrauf (2015) put it that the focus of the adjustments to business networks, goods, and processes will be on customers.

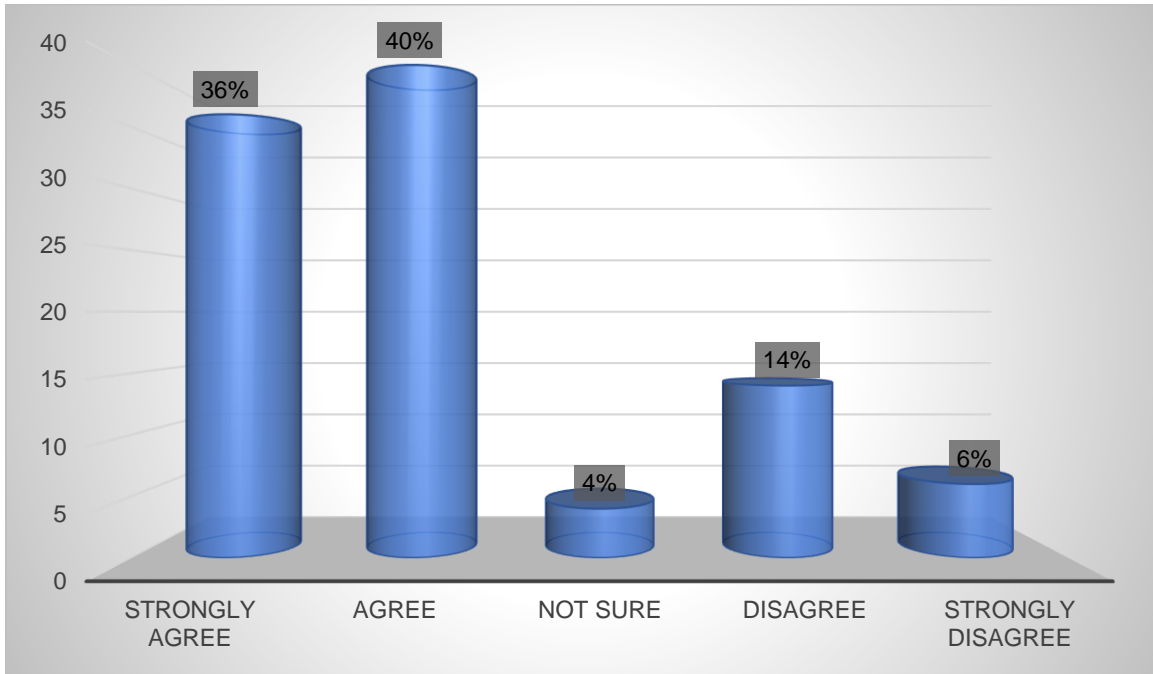
Few respondents from the survey stated that there is a need to employ business intelligence to comprehend and satisfy customers' expectations as goods, technologies, and operations become more and more specialized to their expectations. Hence, respondent X mentioned that "*Flexibility, analytical thinking and strategy ability to compromise*" is one way to improve knowledge regarding the 4IR. However, numerous respondents indicated by 'N/A' that they have not taken any program or initiative to discuss issues relating to technology. This suggests that many SMEs are yet to consider the programs to undertake to understand or at least participate in different programs provided by both government and private sector. This is necessary for 4IR knowledge and the growth of the business. Therefore, the first innovators who seem to be capable of creating prosperous industrial systems will be at a competitive edge over rivals (Geissbauer et al., 2015). Throughout the end, commercial businesses will need to maintain connections with the demand-generating end users or at the very least, connect with technologies that provide them greater accessibility to those customers (Geissbauer et al., 2015).

**Figure 4.13: The Change of old Business Strategies Through the Fourth Industrial Revolution Technologies**



The above figure shows how the 4IR could have an impact on changing the traditional or old ways of running a business. The findings above show that 48% of the respondents indicated that the use of the 4IR technologies changed their marketing strategies. The suggestion is that the respondents believe in the use of the cloud or the internet (social media in particular) to market their business as opposed to posting pamphlets on the streets. This is supported by 22% of the respondents who showed that the 4IR technologies brought about the digital trading business. Equally, this includes the use of the internet to run businesses. Moreover, a sample population group of 30% indicated that the use of 4IR technologies changed their production process. The assumption is that this sample population group use machines to fasten the production of goods or services.

**Figure 4.14: The Negative Impact of the Fourth Industrial Revolution on the Performance of Small and Micro Enterprises**



As the 4IR has an impact on the performance of SMEs, the figure above shows the negative impact of the 4IR on the performance of SMEs. In that, an overall total of 76% of the respondents indicated that the 4IR negatively affects their business. This is because most SMEs are low-tech and experience financial predicaments. Hence, currently, most people prefer to go the businesses that are fast, effective and with good technologies. That subsequently leads to the decline of the customers from SMEs which directly affects their sales and performance. However, this is further demonstrated in the table below:

**Table 4.5: The Impact of the Fourth Industrial Revolution on the Performance of the Business**

	Loss of customers	High cost	New skills	Infrastructure development	Enhance savings	Improve business & customer coordination
<b>Strongly agree</b>	50%	14%	12%	10%	20%	32%
<b>Agree</b>	30%	54%	14%	30%	42%	44%
<b>Not sure</b>	-	2%	10%	10%	12%	6%
<b>Disagree</b>	18%	24%	48%	30%	18%	8%
<b>Strongly disagree</b>	2%	6%	16%	20%	8%	10%
<b>Total</b>	100%	100%	100%	100%	100%	100%

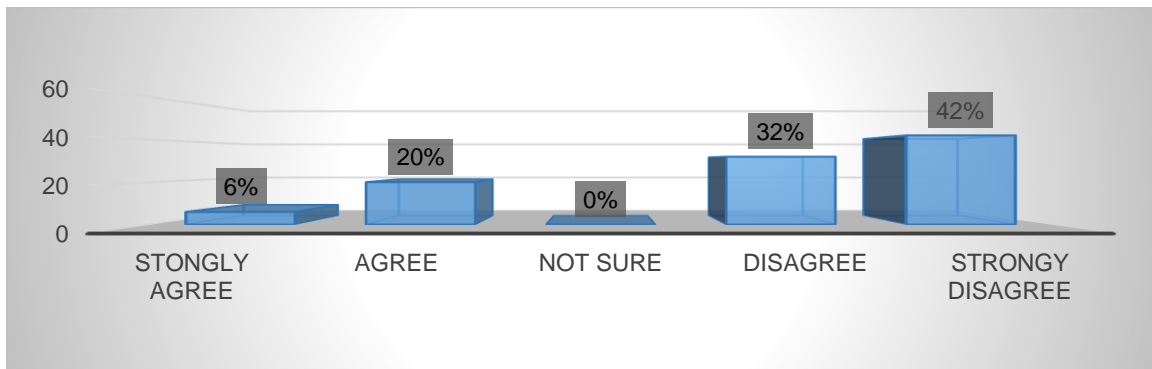
The table above is the core gist of the study. It shows the impact of the 4IR on the performance SMEs. As it has been suggested in the literature that the 4IR has an impact on the performance SMEs, this figure seeks to validate such a hypothesis. Moreover, the 4IR has both positive and negative impacts on the performance of SMEs. From the figure above, a total of 80% of the respondents indicated that the inception of the 4IR technologies lead to the loss of customers in their businesses. The suggestion is that most people choose the most advanced technological businesses because they are more convenient and faster. Additionally, some people prefer online business rather than physical trading. Hence, Parry (2018) refers to online business as “electronic technology” which is currently gaining prominence. Thus, most SMEs do not have an online business to complement physical trading. Therefore, the decline of customers means a decline in finance, sales, and simultaneously a decline in business performance. Some of SMEs could even be dysfunctional because of poor technological innovations.

The cost of technology is one of the key factors that determines and affects the performance of businesses. As per the table above, a total of 68% of the respondents

indicated that the cost of technology is very expensive. As long as many of SMEs in the study area experience financial woes, they cannot maintain or afford the cost of technology. Even if they can, it would still be very expensive. Because the current technology is smart, innovative, and expensive. Be that as it may, a total of 64% of the respondents indicated that the 4IR does not have an impact on their skills. The assumption is that most of the respondents are still using old technologies and have not been exposed to the latest technologies. Some of the respondents do not completely rely on the use of technology. Additionally, their experience also counts in running their businesses. The results from this study refute the sentiment of Rojewski and Hill (2017) who emphasize that the 4IR needs skill-saving technical development which is essential for productivity. However, only a total of 50% of the sampled population group indicated that the 4IR does not have an impact on infrastructure development. This is because some of SMEs operate at home like poultry businesses for instance and some of them are based in Mankweng business centres.

One of the key significance and benefits of technology is to enhance business and customer coordination (Donner & Escobari, 2010). To ensure this, the use of internet services and social media must be utilized. This ensures the effectiveness, convenience and proper channels of communication between the business and stakeholders. The customers coordinate well with their business through access to online platforms. Hence, a total of 76% of the respondents indicated that the 4IR technologies enhance the relations between the business and its stakeholders. Such relations, coordination and connectivity are done through access to the internet services.

**Figure 4.15: Technological Advancement of Small and Micro Enterprises**



The figure above shows the extent of technology in SMEs. As literature hypothetically indicates that most of SMEs in the study area are low-tech, this figure provides a demonstration and validation of the literature. In that, a total of 74% of the sample population group indicated that their SMEs are not technologically advanced. This means that some SMEs still rely on their old systems of technology. Meanwhile, a total of 26% at least indicated that their SMEs have some elements of the latest technologies. This included SMEs such as internet cafés, bakeries and medical services amongst others. However, the inference that could be drawn is that most SMEs still lack updated technological innovations.

#### 4.4.2. Actions Taken by Small and Micro Enterprises to Enhance the Level of Technology

The current technologies require a change in different areas of the business environment. The SMEs are required to adjust and align their strategies along with the change in technology and customers' needs. This theme is profound in outlining and highlighting some of the actions taken by SMEs in improving the state of technology. Although few respondents were able to share their prospects, challenges and actions taken, the majority of the respondents did not take any action as they continue with their traditional methods of trading. As a point of reference, respondent D indicated that *"I try to make WhatsApp group chat to make contact with my clients"*. The stance from the above respondent indicates the use of the IoT to connect with customers. Respondent H mentioned that *"I have added one laptop to make them two, to assist each other"*. At least



some of the respondents attempt to improve their businesses with the least resources available. Contrary to the above respondents, respondent N indicated 'nothing' to show that no effort was done to improve the level of technology in the business. The latter respondent is supported by many other respondents who left the space for answers blank. The suggestion here is that most of the respondents (SMEs) still lack the essential and necessary resources to enhance the use of technology in their operations.

#### **4.5. Presentation of the Research Findings from the Qualitative Interview**

This theme covers the findings and views of the BDO following a telephonic interview that was conducted. Below are the views of the BDO and analysis thereof.

##### **4.5.1. The Challenges and Benefits of the Fourth Industrial Revolution**

The BDO indicated that "*I think technology benefits SMEs because technology is used to advertise the SMEs on the internet or social media*". During the interview, the BDO highlighted that SMEs do not have enough funds to keep up with technology.

##### **4.5.2. Types and Characteristics of Small and Micro Enterprises**

The BDO indicated that to date (2022) "*On the database there is approximately + or – (200) SMEs*". The types of SMEs include street vendors, sewing businesses, spaza shops, traditional beads, aluminium windows and door frames and catering amongst others.

##### **4.5.2.1. The Challenges of Small and Micro Enterprises**

The BDO indicated that "*most of the SMEs do not have capital or funders*". Moreover, the SMEs also face too much competition "*you can find that one street has SMEs that are selling similar items*". It was further highlighted that SMEs lack networking to grow their businesses.

#### *4.5.2.2. The Challenges of Local Economic Development and Enterprise Development Office*

The BDO indicated that “*The enterprise development office under the LED unit does not get enough funds to support SMEs*”, which is a problem. The BDO cited such a challenge as “*budget constraints*”, hence, the respondent also indicated that because of a lack of financial resources allocated to the enterprise development office, the programs/project are “*paused*”. Another problem faced by the enterprise development office is a lack of “*gazebos for the SMEs exhibitions*” as indicated by the BDO.

#### *4.5.2.3. The Role Played by the Enterprise Development in Assisting the Small and Micro Enterprises*

The BDO indicated that the enterprise development office under the LED unit offers programs such as “*capacity building and technical training*”. The respondent indicated that “*...capacity building includes trainings such as business management, marketing and financial management training*” while, technical training includes “*physical training to enhance the skills of the SMEs owners*”. The BDO further indicated that they also offer programs such as “*access to market*” which is done through exhibitions. One of the exhibitions that they offer is “*Polokwane Flee Market*” wherein, there would be some form of competition amongst SMEs and create awareness for SMEs around Polokwane Local Municipality. This is how the LED through the enterprise development office assists the SMEs around Polokwane Local Municipality.

### **4.6. Conclusion**

This chapter discussed and analysed the typologies of SMEs in the study area. It found out that different SMEs ensure the growth of the local economy in the township. It also found that the majority of SMEs are still under the categorization of the informal sector. The chapter also recognizes that as much as SMEs are facing financial obstacles which hinder their headway and their performance. The study found that some of the 4IR technologies have a critical role to play in uplifting business performance. It recommends that different stakeholders must also begin to support SMEs. This will ultimately improve the state and affordability of technology within different SMEs. The chapter provided an

in-depth analysis of the result and drew necessary suggestions from the results. The major findings are that most SMEs are experiencing a decline in customers and poor financial resources. Poor financial resources mean that SMEs cannot afford and maintain the standard of the current technology. This subsequently affects the performance of SMEs. Hence, different stakeholders are recommended to aid the already struggling SMEs in the study area.

## **Chapter 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1. Introduction**

The purpose of this chapter is to briefly encapsulate all the discussions of the study by providing a summary of the major findings, conclusions and recommendations of the study. As a point of recapitulation, the purpose of the study was to uncover the impacts of the 4IR on the performance of SMEs. However, the previous chapter provided findings and analysis of the study from the target population and explored the impacts of the 4IR on SMEs. Therefore, this chapter seeks to provide the overall gist of the discussion.

### **5.2. Summary of the Research**

The general aim of the study was to investigate the impact of the 4IR on the performance of SMEs in Mankweng Township. The impact of the 4IR needs to be well comprehended by the owners/managers of SMEs so that they can salvage any negative impacts of the 4IR that significantly led to poor performance of their businesses. Whilst understanding the impacts of the 4IR be it positive or negative, SMEs need to re-think and re-position their marketing strategies and business activities so that sales could be enhanced. As the 4IR is thought of by many as a capitalist model, it also shapes how the world of business should conduct its business activities using the current and far dominant tools of the 4IR which are the IoT, AI, robotics and CPS, nanotechnology, biotechnology and 3-D printing amongst others. However, this study conceptualised and theorized the concepts associated with the variables or definitions of the study. It provided an in-depth analysis of literature regarding the subject under investigation. Thus, it described the nature of

SMEs and analysed the concepts of the 4IR, relating them to how they impact the performance of SMEs.

The study employed a mixed method approach which encompassed qualitative and quantitative data. For rehearsal, the study employed a survey-based method of collecting data. This method included instruments such as semi-structured questionnaires and an interview schedule. The study also used purposive sampling to get valid information from the respondents. It conveniently sampled the owners of SMEs by administering questionnaires and walking directly to SMEs.

The study focused on Mankweng Township, located in the Limpopo Province. This is a township settlement with a good standard of living. The settlement is characterised by many SMEs which are formal and informal as well as dominated by a high market area. It is one of the growths poles the Polokwane Local Municipality that contributes significantly to the economic growth and development of the province. Therefore, the choice of the study area influenced the results or the findings of the study. The key findings, therefore, indicated that most SMEs are experiencing financial woes which makes it hard for the businesses to improve their sales. Financial quandaries became the key factor that led to poor business performance and lack of technological affordability as far as the 4IR is concerned. It concludes that the 4IR has lowered the performance of the SMEs because SMEs do not have adequate resources.

### **5.3. Conclusions**

The purpose of this theme is to cover and highlights the summary of the key findings from the study. Technology has a critical role to play in the SMEs in Mankweng Township. Though SMEs in the township are still facing poor effectiveness of technology, there is still a long way to go to ameliorate and improve the effectiveness of technology in their businesses. However, the long way can be cut-short by making the resources available to SMEs. The resources must be provided by the relevant stakeholders concerned.

However, it is very clear from the literature and findings that the 4IR could also enhance a competitive market for SMEs to compete with one another. Be that as it may, SMEs are very crucial in ensuring the development of Mankweng Township. Their contribution to the local or township economy must be supported to keep the momentum of the business market running. Hence, SMEs are one of the growth poles of Polokwane Municipality. Although the municipality through the unit of the LED is putting strenuous efforts to aid SMEs, it must still do more in support of the SMEs. However, SMEs do not only benefit the economy but also assist at an individual level because individuals are able to make a living and satisfy some of the basic necessities of life. This is shown in the research findings and analysis that people start SMEs for different reasons, but it to reduce poverty, income generation and employment creation. Therefore, it is highly noted that SMEs are the backbone to uplift the business acumen in any township area. As a matter of recapitulation, the study aims to investigate the impact of the 4IR on the performance of SMEs. Moreover, the objectives of the study are as follows:

- To analyse the challenges and benefits of the 4IR
- To explore the types and characteristics of SMEs
- To assess the impacts of the 4IR on the performance of SMEs

### **Objective #1: To Evaluate the Challenges and Benefits of the Fourth Industrial Revolution**

#### 5.3.1. The Perceptions of the Fourth Industrial Revolution

- The respondents were provided with an opportunity to share their thoughts on the 4IR concept. Although the 4IR has been explored and detailed in the literature, it was still required to collect feedback from the respondents to acquire their perspectives on the 4IR concept. Despite the fact that the respondents' perspectives varied, one of the main inferences is that the respondents stated that the 4IR is important for enhancing various business activities. Additionally, they concur that the 4IR makes life simpler and much quicker.

### 5.3.2. The Effectiveness of the Fourth Industrial Revolution in the Small and Micro Enterprises

- The majority of respondents (58%) indicated that the effectiveness of technology on their business operations is very less. This demonstrates how SMEs have very primitive levels of technology. It can be because outdated technology or equipment is being used. The respondents (34%), however, claimed that technology is ineffective in their businesses. Nevertheless, the 4IR is effective, according to 4% of the respondents. This implies that a small percentage of the respondents are competent users of the latest technology.

### 5.3.3. The use of Cyber-Physical Systems and the Internet of Things to enhance the Functioning of the Business

- The majority of the respondents (72%) indicated that the use of CPS and IoT is valuable and improves the connectivity and coordination between the customers and stakeholders. The vast majority of those surveyed are thought to have access to the internet via laptops and other mobile devices. Hence, they could easily access social media platforms to communicate and connect with their stakeholders. Meanwhile, 18% of the respondents reported that the use of CPS and IoT does not enhance business coordination.

### 5.3.4. The Benefits of the Fourth Industrial Revolution

- Concerning the enhancement of productivity, the surveyed respondents (40%) concurred that one of the benefits of the 4IR is to enhance productivity. This means that the SMEs are at least able to capitalize on the use of the 4IR technologies to expedite their production process.
- Concerning efficiency, the majority of the respondents (76%) indicated that the 4IR is capable of improving efficiency in their businesses. The idea is that most of the respondents from the survey see 4IR as using the least available resources with minimum economic wastage to achieve their desired outcomes.
- Around improved savings, about 68% of the respondents showed that the 4IR has the potential and ability to enhance savings. The suggestion is that the use of the

4IR technologies brings income rather than being an expense. This is also aligned with 70% of the respondent who indicated that the use of 4IR technologies reduces costs. This is because the technological elements do not demand a salary increase, get paid and demand all the benefits that an employee may require. Hence, Wisskirchen et al (2017: 14) proffer that the use of technology is cheaper than a worker.

- Respondents (74%) indicated that the 4IR improves coordination. Hence, the application of technology creates harmony in the performance of numerous activities or obligations to effectively meet business objectives. It also has to do with people's capacity to connect with one another via technology for business-related purposes. This is followed by the respondent (52%) who have indicated that the 4IR ensures a flexible work environment. The flexible work environment means that the 4IR makes the work environment simpler and easier to do.
- The study's findings on enhancing customer connections revealed that 78% of respondents agree that the 4IR strengthens such a relationship. The CPS and IoT are at the heart of improving such a relationship between various stakeholders, according to most of the respondents (72%). Most significantly, social networking sites are essential to fostering better relationships between various stakeholders.

#### 5.3.5. Challenges of the Fourth Industrial Revolution

- Concerning the respondents' skills, exactly 48% of the population surveyed indicated that acquiring new skills is not a hurdle for their organization. The respondents' expertise and familiarity with their technical systems account for this as they have been running their business for a while. As a result, they are skilled and equipped to manage the business using their (old) technology. This contradicts the literature's assertion that the 4IR demands new skills.
- The survey discovered that most of the respondents (68%) indicated that one of the 4IR's challenges is the high cost and maintenance of technology. The underlying assumption is that the majority of respondents lack the financial means to cover the existing technology's excessive costs and servicing.

- The majority of respondents (62%) disputed the literature's assertion that one of the obstacles of the 4IR is infrastructure development by demonstrating that the 4IR does not provide a barrier to infrastructure development. The implication is that the study area as a township has adequate infrastructure development and electricity.
- In terms of the AI, most of the respondents (64%) indicated that AI is not a challenge to their business as the literature indicated that AI is one of the challenges of the 4IR for businesses because of the cost and maintenance associated with the AI. Here, it is assumed that the respondents do not incorporate AI into their everyday business activities. However, this is followed by 78% of the respondents who indicated that the 4IR requires new equipment.
- The 54% of respondents showed that unemployment is not a challenge in the 4IR epoch. The firm certainty is that most of the respondents are self-employed and do not see unemployment as a challenge. This, however, opposes the literature because the respondents are smart, creative and entrepreneurs who always outmanoeuvre difficult situations and attempt to find solutions.
- The majority of the respondents (92%) indicated that data security is not a challenge to their businesses. This means that most of the respondents do not upload their business information to the cloud which could be hacked.

## **Objective #2: Types and Characteristics of Small and Micro Enterprises**

### 5.3.6. The Types of Small and Micro Enterprises

- The study discovered that the study area is home to a large number of SMEs. The SMEs included, among others, hair salons, internet cafes, panel beaters, medical services, shoe repairs, bakeries, carpentry, poultry, and traditional bead vendors. However, the majority of the respondents (26%) indicated by the option labelled 'other' and specified their type of business that is not provided on the survey questionnaire. Therefore, the option 'other' covered businesses like those who make traditional beads, driving schools, carpentry, chisa nyama, dry cleaning, and spaza stores among others.



### 5.3.7. Categorization of Small and Micro Enterprises

- The study found that a vast majority of the respondents (74%) indicated that their businesses are categorized as micro businesses that employed between 1-5 employees. This is followed by the 26% of the respondents who indicated that their businesses fall under the category of small that have employed between 1-10 employees.

### 5.3.8. Number of People Working in the Business

- This theme validated the previous theme by showing the number of people working in each SME. Therefore, 74% of the respondents indicated that between 1-5 people are working in their businesses. Moreover, about 26% of the respondents indicated that 6-10 people are working in their business.

### 5.3.9. Characteristics of Small and Micro Enterprises

- On formal and informal SMEs, the study found that the majority of SMEs (60%) are informal and (40%) are formal. The study area is dominated by informal SMEs.
- On self-governance, most of the respondents (60%) have indicated that they run their own businesses.
- In terms of the market area, many respondents (66%) have indicated that their businesses exist in a fixed location only. Their market area is Mankweng Township only.
- On cooking and baking, about 24% of the total sample population group indicated that their businesses are seen through cooking and baking. The remaining 76% of the respondents indicated that their businesses are not involved in cooking and baking.
- On the issue of fixing cars, only 8% of the respondents indicated that their businesses are seen through fixing cars and the remaining 92% of the respondents opposed that their businesses are involved in fixing cars.

- The study found that 12% of the respondents indicated that their businesses are seen through offering internet services, whereas only 4% indicated that their businesses are seen through offering teaching and learning services. Moreover, about 4% of the respondent indicated that their businesses are involved and seen through offering shoe services

#### 5.3.10. The Rationale for Establishing Small and Micro Enterprises

- The study found that the majority of the respondents (58%) indicated that they have established their businesses for income generation to at least satisfy their basic necessities of life. Thus, 28% of the respondents indicated that they started their businesses to reduce poverty while 14% of the respondents showed that the rationale for establishing SMEs is to create employment.

#### 5.3.11. The Significance of Small and Micro Enterprises

- The SMEs are very paramount for different reasons, hence, the respondents have shared their notions regarding the importance of SMEs. While the previous theme indicated some of the reasons for establishing SMEs, this theme elaborates on the significance of SMEs. Therefore, there are similar perceptions from the respondents that SMEs play an imperative role in meeting some of the basic needs. According to the findings, SMEs improve people's standards of living through generating money, reducing poverty, and diversifying sources of livelihood.

#### 5.3.12. The Challenges of Small and Micro Enterprises

- On lack of finance, the study found that a vast majority of the respondents (82%) indicated that their businesses experience financial challenges. Financial predicaments limit business performance.
- The study also found that (52%) of the respondents indicated that there is still a lack of information. The suggestion is that a lack of information includes information regarding business registration, information on access to finance and SMEs support organizations.

- In terms of poor skills, the respondents (86%) refuted the insights from the literature that SMEs experience poor skills as one of their challenges. The notion is that majority of the respondents have long been in the business industry and have gained some business skills and ideas.
- On illiteracy, the majority of the respondents (62%) indicated that illiteracy is not a challenge to their businesses. Hence, the majority of the respondents have some form of formal qualifications at least from grade 10, 12 and higher educational qualifications. This is followed by 48% of the respondents who have indicated that unqualified personnel are not a predicament to their business
- The results of the study revealed that lack of planning continues to haunt SMEs. In that, 62% of the respondents indicated that lack of planning is one of the challenges to their businesses. Some respondents decide how and when to run a business without proper planning such as a business plan.
- Poor access to a market was also found to be a great challenge to the majority of SMEs (70%). The result indicated that there is a lack of expansion from SMEs because they only operate in a fixed location which limits them to access other markets in different vicinities.
- The majority of the respondents (66%) indicated that the current cost of technology is one of the challenges that they are facing. It is because the cost of technology is expensive, and SMEs do not have sufficient amounts of money to afford and maintain the 4IR technologies which make their performance to be less effective.

#### 5.3.13. The Awareness of the Programs/Projects to Support Small and Micro Enterprises

- The study found that the majority of the respondents are not familiar with the projects/programs and organizations that support SMEs. This relates to a lack of access to information by SMEs. It is only a few who indicated they know organizations such as NYDA, IDC and the government to a larger extent.

#### 5.3.14. The Affordability of the Fourth Industrial Revolution Technologies

- The 4IR encompasses technological systems such as the IoT, additive manufacturing, AI, robotics, CPS, biotechnology and nanotechnology. The

majority of the respondents (68%) indicated that they can afford the use of the IoT whereas, a few respondents (12%) indicated that they could afford additive manufacturing and lastly, 20% indicated that they cannot afford the 4IR technologies.

#### 5.3.15. The Cost and Maintenance of the Fourth Industrial Revolution

- The results revealed that about 60% of the respondents indicated that their businesses cannot afford and maintain the current cost of technology. This is because most SMEs face financial woes. However, 34% of the respondents indicated that they could at least be able to purchase and maintain some of the technological elements suitable for their business.

#### 5.3.16. The Skills and Knowledge Compatible with the Fourth Industrial Revolution

- The study revealed that 36% of the respondents can utilize some of the technologies because they have skills and knowledge. Perhaps, this is because of their experience in running their businesses, be it low tech or high tech. However, 46% of the respondents showed that they do not have the necessary skill and knowledge about the current technologies for the purpose of business growth.

#### 5.3.17. The Programs or Initiatives taken by Small and Micro Enterprises

- The general perception from the respondents is that only a few SMEs have undertaken some initiatives or at the very least attempted to induct some of the employees, although, this might be done informally. The study found that the majority of the respondents did not take any effort in attempting to enhance or capacitate their personnel about the 4IR technologies through inductions or workshops whether formally or informally.

### 5.3.18. The Change of old Business Strategies Through the Fourth Industrial Revolution Technologies

- The majority of respondents (48%) indicated that their marketing methods had changed as a result of using contemporary technologies. A total of 30% of the respondents indicated that the 4IR changed their production method. The 4IR, according to 22% of the respondents, prompted certain elements of their business strategies to be carried out digitally through the usage of the internet.

### 5.3.19. The Negative Impact of the Fourth Industrial Revolution on Performance of the Small and Micro Enterprises

- The study found that the majority of the respondents (76%) indicated that the 4IR has a negative impact on the performance of their business. Hence, with poor technological equipment and financial resources, SMEs cannot operate to their maximum capacity and produce more items nor render services effectively.

## **Objective #3: The Impact of the Fourth Industrial Revolution on Performance of the Business**

- Concerning the loss of customers; the majority of respondents (80%) indicated that they have witnessed a decrease in customers due to poor or ineffective technology, which has resulted in a reduction in revenue. Customers, therefore, always seek good services and a suitable working environment that is technologically cutting edge and efficient to satisfy their market demands.
- On the high cost of technology; most of the respondents (68%) indicated that the cost of the current technology is very expensive, and SMEs cannot afford it due to their financial woes which ultimately affect their performance.
- Regarding the new skills, most of the respondents (64%) indicated that the 4IR does not have an impact on their skills. Currently, most of the respondents have skills in running their businesses with their knowledge and old technological systems.

- Concerning infrastructure development, most of the respondents (50%) indicated that the 4IR is not a challenge to their infrastructure development because Mankweng Township has a good infrastructure with proper roads and electricity.
- On enhanced savings, many of the respondents (62%) indicated that the 4IR enhances their savings. This is because the use of technological equipment is not more expensive than a worker since the machines do not get paid every month. Machines only require service and maintenance after a while.
- On the technological advancement of SMEs, most of the respondents (74%) indicated that their businesses are not technologically advanced. They still use their old technologies to keep their business running. Only a few respondents (26%) indicated that they at least have some good technological equipment/systems that are advanced.
- The study found that there is less effort taken to improve the level of technology in SMEs. Most of the respondents have indicated that they have done nothing, and never undertook any program/project that could improve the functioning of technology within their business.

#### **5.4. Recommendations**

Some of the recommendations to improve the performance of SMEs with regard to technology are discussed below. There are some initiatives and programs that could be utilized for SMEs' transformation. Recommendations are outlined as follows:

- That SMEs should be professionalised with high-quality personnel that is qualified to carry out tasks that are in line with the use of technology. Since most of SMEs are informal in the study area, there is a need for business registration. This is essential because it would provide SMEs with more chances or create opportunities for getting more stakeholders on board to come and invest in the business. Hence, stakeholders also look to invest in a business that is well structured with good organizational principles. Their investment will be key in ensuring the sustainability and performance of SMEs.

- There is a need to provide financial means to the limping and struggling SMEs and uplift them financially. Finance cuts across all the spheres of the business. In fact, there is no business without capital investment. This study found that a substantial number of SMEs are in a financial fiasco. Therefore, improving the financial state of the SMEs would ultimately increase profits/sales, enhance savings, expand the business, have access to markets, afford technology and enhance business infrastructure development. To achieve this, the government, individuals and private sector should be on board and aid SMEs with the financial means to run and sustain the business.
  
- Organizations such as the NYDA, SEFA, SETA, SEDA and NDSBD are critical in providing support to SMEs. Thus, SMEs must capitalize on the use of such organizations for any kind of assistance that the business may require. Through the support from such businesses, SMEs may improve and attract more customers to their business. SMEs would also improve on their usage of technology and begin to use the latest technology. However, more customers mean more profit maximization and more profit means business performance.
  
- The programs such as capacity building, technical training, access to market and business exhibitions provided by the office of the enterprise development under the LED unit must be extended. The capacity program includes business training, marketing training and financial management training for SMEs. On the other hand, technical training programs include the ability to recognize the physical skills of entrepreneurs. The business exhibitions refer to creating a competition amongst the businesses, creating awareness and an environment for SMEs. These are some of the programs that are offered by the business development under the LED unit in Polokwane Municipality.

- The BDO must be allocated enough funds to aid SMEs and run the programs and exhibitions so that SMEs can perform better. This is because a lack of financial resources halts the programs/projects of the enterprise development office.

### **5.5. Limitations of the Study**

The researcher came across a few challenges during the process of data collection. The first challenge was a lack of interest from some of the respondents. In addition, due to unforeseen circumstances such as financial constraints, the interview with the BDO was conducted telephonically. Furthermore, the researcher encountered a delay from the office of the Municipal Manager (MM) to get an approval letter for data collection. Lastly, the study was limited to only covering Mankweng Township.



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## LIST OF APPENDICES

### Appendix A: Questionnaire



This questionnaire is designed to survey individuals for the research project on

**“THE IMPACT OF THE FOURTH INDUSTRIAL REVOLUTION ON THE PERFORMANCE OF THE SMALL AND MICRO ENTERPRISES: A CASE OF MANKWENG TOWNSHIP, POLOKWANE LOCAL MUNICIPALITY, SOUTH AFRICA”.**

The Research Project is registered with Master of Development Studies in Planning and Management at the Department of Development Planning & Management, School of Economics & Management, Faculty of Management and Law. Kindly assist by providing information required in this questionnaire.

#### **Kindly note the following:**

1. Participation will be voluntarily.
2. All participants are guaranteed the privacy and anonymity of information.
3. The participants would be respected and not undermine their culture, values, and believes.
4. Participants would not be harmed either emotionally or physically.
5. Respondent’s names would not be disclosed to the public.

Please use a tick [✓] to mark on the relevant boxes where necessary.

**Section A: Demographic Profile**

A.1. What is your age?

1. 0-15 [ ] 2. 16-25 [ ] 3. 26-30 [ ] 4. 31-35 [ ] 5. 36-40 [ ] 6. 41-45 [ ]

7. Other specify.....

A.2. What is your gender?

1. Male [ ] 2. Female [ ]

Other please specify.....

A.3. What is your highest qualification?

1. Grade 10 [ ] 2. Grade 12 [ ] 3. Certificate/Diploma [ ] 4. Degree [ ] 5. Postgraduate [ ] 6 None [ ]

6. Other please specify.....

**Section B: The Challenges and Benefits of the Fourth Industrial Revolution?**

B.1. What are your thoughts about the fourth industrial revolution in the small and micro enterprises?

.....  
.....  
.....

B.2. What is the effectiveness of the fourth industrial revolution in your business?

1. Very effective [ ] 2. less effective [ ] 3. not sure [ ] 4. not effective [ ] 5. effective [ ]

B.3. Do you think cyber physical systems and internet of things improve the functioning between the business and employees?

1. Strongly agree [ ] 2. agree [ ] 3. not sure [ ] 4. disagree [ ] 5. strongly disagree [ ]



B.4. What are the benefits of the fourth industrial revolution in your business?

	1. Strongly agree	2. Agree	3. Not sure	4. Disagree	5. Strongly disagree
B.4.1. Enhance productivity					
B.4.2. Efficiency					
B.4.3. Improve savings					
B.4.4. Reduce costs					
B.4.5. Enhance coordination					
B.4.6. Flexible work environment					
B.4.7. Improve connections with customers					

B.4.8. Cyber physical systems and internet of things					
--	--	--	--	--	--

B.5. What challenges does the fourth industrial revolution pose to your business?

	1. Strongly agree	2. Agree	3. Not sure	4. Strongly disagree	5. Disagree
B.5.1. New skills					
B.5.2. High cost & maintenance					
B.5.3. Infrastructure development					
B.5.4. Artificial intelligence					
B.5.5. New equipment					
B.5.6. Unemployment					
B.5.7. Data security					

6. Other please specify.....

## Section C: Types and Characteristics of Small and Micro Enterprises

C.1. What type of an SME is your business?

1. Shoe repair [ ] 2. Panel beaters [ ] 3. Street vendors [ ] 4. Hair salon [ ] 5. Internet café [ ] 6. Car wash [ ] 7. Child or old age care centres [ ] 8. catering [ ] 9. bakery [ ] 10. photography [ ] 11. Fridge repairs [ ] 12. Medical services [ ] 13. Brick manufacturing [ ] 14. Clothes sewing [ ] 15. Farming [ ]

12. Other please specify.....

C.2. How would you categorize your business?

1. Small 1-10 employees [ ] 2. Micro 1-5 [ ]

C.3. How many people are working in your business?

1. 1-5 [ ] 2. 6-10 [ ] 3. 11-15 [ ] 4. 16-20 [ ] 5. 21-25 [ ]

6. Other please specify.....

C.4. What characterizes such a business?

	1. Strongly Agree	2. Agree	3. Not applicable	4. Disagree	5. Strongly Disagree
C.4.1. Informal/ unregistered					
C.4.2. Formal/ Registered					
C.4.3. Self-governance					

C.4.4. Market area					
C.4.5. Cooking & baking					
C.4.6. Fixing cars					
C.4.7. Internet services					
C.4.8. Teaching & learning					
C.4.9. Shoe services					

Other please specify.....

C.5. What was the reason behind establishment of your business?

- 1. Reduce poverty [ ]
- 2. employment creation [ ]
- 3. income generation [ ]

C.6. How does your business play a role in reducing poverty and enhance local economic development?

.....

.....

.....

C.7. What are the challenges in your business?

	1. Strongly agree	2. Agree	3. Not sure	4. Disagree	5. Strongly disagree
C.7.1. Lack of finance					
C.7.2. Lack of information					
C.7.3. Poor skills					
C.7.4. Illiteracy					
C.7.5. Unqualified personnel					
C.7.6. Lack of planning					
C.7.7. Poor access to markets					
C.7.8. Cost of technology					
C.7.9. Poor infrastructure					

C.7.10. Other please specify .....

C.8. What support programs or organization are you aware of in supporting small and micro businesses? Mention all that you know.

.....

.....

.....

**Section D: The impact of the Fourth Industrial Revolution on the Performance of the Small and Micro Enterprises**

D.1. Which of these elements of the 4IR can your business afford?

- 1. Additive manufacturing [ ]
- 2. internet of things [ ]
- 3. artificial intelligence [ ]
- 4. cyber physical systems [ ]
- 5. none of the above [ ]
- 6. All of the above [ ]

D.2. Can your business afford the cost and maintenance associated with the 4IR?

- 1. Strongly agree [ ]
- 2. agree [ ]
- 3. not sure [ ]
- 4. disagree [ ]
- 5. strongly disagree [ ]

D.3. Do you have necessary skills and knowledge which are compatible with the current advanced technology?

- 1. Strongly agree [ ]
- 2. agree [ ]
- 3. not sure [ ]
- 4. disagree [ ]
- 5. strongly disagree [ ]

D.4. What programs or initiatives have you undertaken to improve the skills and knowledge to be compatible with the fourth industrial revolution? Indicate by “N/A” if you did not undertake any initiative or a program.

.....  
.....  
.....

D.5. How can the fourth industrial revolution change your old way of doing business?

- 1. Change in marketing [ ]
- 2. going more digital [ ]
- 3. change in production [ ]

D.6. Do you think the fourth industrial revolution has negative impact on the performance of your business?

- 1. Strongly agree [ ]
- 2. agree [ ]
- 3. not sure [ ]
- 4. disagree [ ]
- 5. strongly disagree [ ]

D.7. What impact does the fourth industrial revolution have on the performance of your business?

	1. Strongly agree	2. Agree	3. Not sure	4. Disagree	5. Strongly disagree
D.7.1. Loss of customers					
D.7.2. High costs					
D.7.3. New skills					
D.7.4. New infrastructure development					
D.7.5. Enhance Saving					
D.7.6. Improve customer & business coordination					

D.7.7. Other please specify.....

D.8. Is your business technologically advanced?

1. Strongly agree [ ] 2. agree [ ] 3. not sure [ ] 4. disagree [ ] 5. strongly disagree [ ]

D.9. What have you done to improve the usage of technology in your business?

.....  
 .....  
 .....

**Section E: Recommendations**

E.1. What kind of assistance does your business require to reduce the negative impact of the fourth industrial revolution?

	1. Strongly agree	2. Agree	3. Not sure	4. Disagree	5. Strongly disagree
E.1.1. Financial					
E.1.2. Business training					
E.1.3. Computers					
E.1.4. New machines					
E.1.5. Business registration					

E.1.6. Other please specify.....

E.2. Who do you think should provide such support as mentioned above?

1. Individuals [ ] 2. Government [ ] 3. Private donors [ ] 4. Individuals and Government [ ] 5. Private donors and Individuals [ ] 6. Government and Private donors [ ]



***Thank you for your cooperation and support.***

## Appendix B: Interview Schedule



### Sample Interview Schedule

University of Limpopo, Faculty of Management and Law

Department of Development Planning and management

#### Background Information

This interview schedule is planned to interview and acquire information from the BDO (enterprise development office) under the LED unit in Polokwane Local Municipality. The interview schedule requires information about the “*The Impact of the Fourth Industrial Revolution on the Performance of the Small and Micro Enterprises: a case of Mankweng township, Polokwane Local Municipality, South Africa*”. It would be a privilege if you take your few minutes and respond to the questions to be asked. Kindly note that, the information that you would provide would be strictly for academic purposes and would not be used against you or the municipality. Kindly assist in providing information from these questions. This interview schedule is voluntary.

Researcher

Supervisor

1. Approximately how many SMEs in Mankweng are registered within the database of Polokwane Local Municipality?
2. Do you think the SMEs have adequate capacity and ability to keep up with the growing technology?
3. In what way do you think the fourth industrial revolution could impact on the SMEs?
4. How does the SMEs assist the municipality in job creation?
5. What kind of challenges do you think SMEs are facing?
6. What are the challenges that LED is facing in terms of supporting SMEs?
7. What role does your department play in assisting the SMEs?
8. What programs or projects did you undertake to assist the SMEs?
9. What would you recommend that the LED office can do to improve its support to SMEs?

## Appendix C: Consent letter for SMEs



University of Limpopo

Faculty of Management and Law

School of Economics and Management

Department of Development Planning and Management

Private Bag X1106, Sovenga, 0727, South Africa

Tel: (015) 268 2558,

Email: [nkosinathi.khwela@ul.ac.za](mailto:nkosinathi.khwela@ul.ac.za)

---

**From:** Dr M.N Khwela, Senior Lecture, Development Planning and Management

**To:** Mankweng SMEs owners

**Date:**

---

**Subject:** Request to conduct field work for Master of Development Studies (Planning and Management) for the research title: “*The Impact of the Fourth Industrial Revolution on the Performance of Small and Micro Enterprises: A Case of Mankweng Township, Polokwane Local Municipality, South Africa.*”

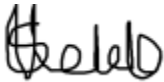
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As the subject above bears reference, the University of Limpopo offers a master’s degree i.e., (Master of Development Studies in Planning and Management) with a Research Project Module (MDP 011). From this research project, the students are required to provide or collect practical information from the ground which displays real experiences

from the participants concerned. This research project is compulsory for students to complete their qualification. I am therefore, requesting for your permission and that you grant the student an opportunity to collect data from your business regarding the subject under investigation. Please note that the information that you may provide would be used for academic purposes only. The information may not be used against the business and that the information provided would be kept in a private manner for the duration of the study. However, the likelihood of the questionnaire causing discomfort or posing risks to the participants would be negligible because the researcher is well-trained in respect of being considerate of the social principles and ethics of the community.

I hope that this letter finds you well

Student: Selelo M.E, (201506391)

A handwritten signature in black ink, appearing to read 'Selelo'.

Master of Development Studies (Planning and Management)

## Appendix D: Ethical Clearance (TREC)



**University of Limpopo**  
Department of Research Administration and Development  
Private Bag X1106, Sovenga, 0727, South Africa  
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

**TURFLOOP RESEARCH ETHICS COMMITTEE**  
**ETHICS CLEARANCE CERTIFICATE**

**MEETING:** 27 June 2022

**PROJECT NUMBER:** TREC/148/2022: PG

**PROJECT:**

**Title:** The Impact of the Fourth Industrial Revolution on the Performance of Small and Micro Enterprises: A Case of Mankweng Township, Polokwane Local Municipality, South Africa.

**Researcher:** ME Seelo

**Supervisor:** Dr MN Khwela

**Co-Supervisor/S:** N/A

**School:** School of Economics and Management

**Degree:** Masters of Development in Planning and Management

**PROF D MAPOSA**  
**CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE**

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

**Note:**

- i) This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.
- ii) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.
- iii) PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

## **Appendix E: Consent Letter, Polokwane Local Municipality**

MS. R.E RAMELA (EXT 2344)

**DIRECTORATE: CORPORATE AND SHARED SERVICES**

**ITEM:**

**FILE REF: # 515557**

### **REQUEST TO GRANT ME SELOLO PERMISSION TO CONDUCT RESEARCH WITHIN POLOKWANE MUNICIPALITY**

**Report of the Director: Corporate and Shared Services**

#### **Purpose of the Report**

To request the Municipal Manager to grant ME Selolo to conduct research at Polokwane Municipality.

#### **Background and Discussion**

ME Selolo sent a letter requesting permission to conduct research at Polokwane Municipality. Research topic is title: "The impact of the fourth industrial revolution on the performance of small and micro enterprise: A case of Mankweng Township, Polokwane Local Municipality, South Africa"

"A copy of the letter from University of Limpopo"

#### **Financial Implication**

There is no financial implication.

#### **Recommend**

1. That approval be granted to ME Selolo to conduct research within Polokwane Municipality.
2. That the findings emanating from the research study be shared with the Municipality before they are published.

**REQUEST TO GRANT ME SELELO PERMISSION TO CONDUCT RESEARCH**

  
MR. J.L. MANYAMA  
HUMAN RESOURCE MANAGER

Recommended / Not Recommended

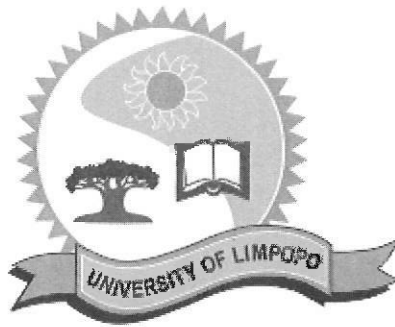
*pp*  *ACT*  
MRS. M.M. MATSHIVHA  
Director CORPORATE AND SHARED SERVICES

Approved / Not Approved

  
MR. N. ESSA  
ACTING MUNICIPAL MANAGER

REQUEST TO GRANT ME SELELO PERMISSION TO CONDUCT RESEARCH





**University of Limpopo**  
Department of Development Planning & Management  
School of Economics and Management  
Faculty of Management & Law  
Private Bag X1106, Sovenga, 0727, South Africa  
Tel: (015) 268 4003, Fax: (015) 268 2215, Email: [nkosinathi.khwela@ul.ac.za](mailto:nkosinathi.khwela@ul.ac.za)

---

---

**From:** Dr M.N Khwela, Senior Lecture, Development Planning and Management

**To:** Officials of Local Economic Development and Planning Unit, Polokwane Local Municipality

**Date:**

---

**Subject:** Request to conduct field work for Master of Development Studies (Planning and Management) for the research title: *"The Impact of the Fourth Industrial Revolution on the Performance of Small and Micro Enterprises: A Case of Mankweng Township, Polokwane Local Municipality, South Africa."*

---

As the subject above bears reference, the University of Limpopo offers a master's degree i.e., (Master of Development Studies in Planning and Management) with a Research Project Module (MDP 011). From this research project, the students are required to provide or collect practical information from the ground which displays real experiences from the participants concerned. This research project is compulsory for students to complete their qualification. I, am therefore, requesting for your permission and that you grant the student an opportunity to collect data from your institution regarding the subject under investigation. Please note that the information that you may provide would be used for academic purposes only. The information may not be used against the institution and that the information provided would be kept in a private manner for the duration of the study. However, the likelihood of the interview causing discomfort or posing risks to the participants would be negligible because the researcher is well-trained in respect of being considerate of the social principles and ethics of the community.

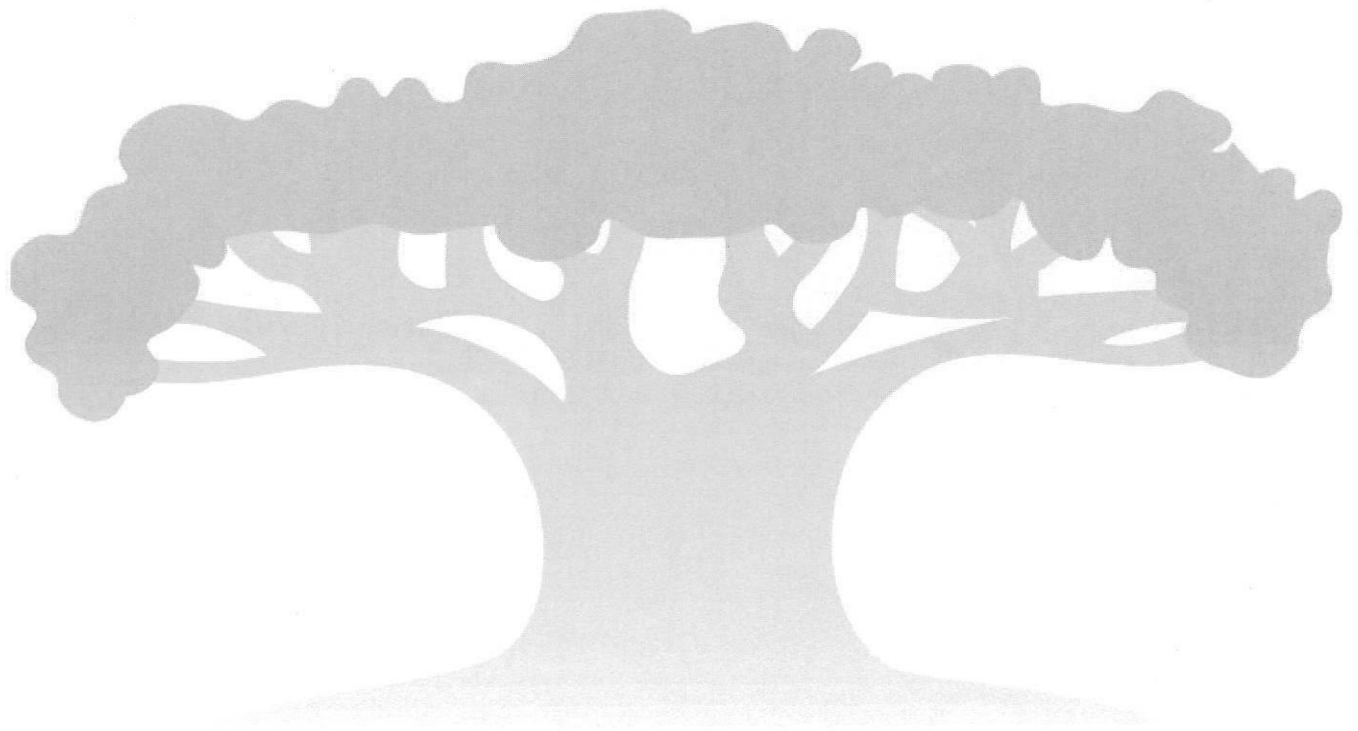
I hope that this letter finds you well.

Student: Selelo M.E, (201506391)

[seleloernest@gmail.com](mailto:seleloernest@gmail.com)

Selelo

Master of Development Studies (Planning and Management)



*Finding solutions for Africa*



**MOKGAPA  
LANGUAGE EDITING  
AND PROOFREADING**

Registration: K2020/873854/07  
Cell: 076 214 7825/078 060 2238  
email: mokgapa@sigaal.com

*Editing | Formatting | Proof-reading | Plagiarism & source confirmation*

---

TO WHOM IT MAY CONCERN

---

Dated 06 September 2022

RE: EDITORIAL CERTIFICATE

This is to certify that the research dissertation titled **"THE IMPACT OF THE FOURTH INDUSTRIAL REVOLUTION ON THE PERFORMANCE OF THE SMALL AND MICRO ENTERPRISES: A CASE OF MANKWENG TOWNSHIP, POLOKWANE LOCAL MUNICIPALITY, SOUTH AFRICA"**, written by Mohale Ernest Selelo of Student No. 201506391, was edited by **MOKGAPA LANGUAGE EDITING AND PROOFREADING**, registered under **DANNY FORT HOLDING, K2020/873854/07**.

The document was edited for grammatical and technical errors. The editor aspired to ensure that the author's intended meaning was not altered during the process of editing. All amendments and changes made were tracked with the Microsoft Word "Track changes", this allows for the author to reject or accept each change individually as well as comments which allow the author to accept or decline suggestions. It is hoped that if all the recommendations are to be fastidiously attended to, the target reader (s) would find the author's work easy to understand.

Yours in good faith

Mokgapa Prince Lesibana. (candidate attorney, UL campus Law clinic)

Researcher.

*LLB (UL), LLM (UL)*

*Providing editing locally, reliably and efficiently.*