“MAY THE FOURTH BE WITH YOU”: HOW WILL THE FOURTH INDUSTRIAL REVOLUTION IMPACT SOUTH AFRICA’S LABOUR FORCE?

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CHAPTER ONE: INTRODUCTION AND GENERAL ORIENTATION TO THE DISSERTATION

1.1 Research Problem

With the Third Industrial Revolution coming to an end and the Fourth Industrial Revolution (4IR) ready to take its place, questions concerning how this new industrial revolution will impact the current and future labour force are inevitable. The advent of the Fourth Industrial Revolution necessitates the development of new policies, strategies, and out-of-the-box thinking to enable the whole of society to be included to take advantage of the opportunities presented by the Fourth Industrial Revolution and to participate in the advancements brought about by the Fourth Industrial Revolution.[1]

The Fourth Industrial Revolution, also known as Industry 4.0, sets to upscale the technology developed during the Third Industrial Revolution and fuse them with new ideas.[2] This new industrial revolution is seen as a cross-cutting enabler.[3] Countries capable of accommodating this new change, for instance, South Africa, run the risk of , such as Kenya and Uganda.[4] My focus throughout this study is to investigate the effect of the Fourth Industrial Revolution through the lens of current and future employees, employers and the workplace in general being more affected by this change than countries that are still digitally and technologically behind. The impact of the Fourth Industrial Revolution must not be underestimated, and proper strategies to cater for this colossal disruptor can only follow a thorough investigation.

1.2 Research Questions

This mini-dissertation will address the following main research question:

Do current labour laws sufficiently provide for the impact of the Fourth Industrial Revolution in the modern South African workplace?

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1 GK 646 Government Gazette 2019: 5(42388).
2 Schwab 2016: 5 - 7.
3 GK 646 Government Gazette 2019: 5(42388).
4 Deloitte “Preparing tomorrow’s workforce for the Fourth Industrial Revolution”, https://www.deloitte.com/content/dam/assets-shared/legacy/docs/research/2022/gx-preparing-tomorrow-workforce-for-4IR.pdf (accessed on 25 February 2021).

The mini-dissertation will also address the following secondary research questions:

1. What is the Fourth Industrial Revolution? This investigation will not be done in isolation but will warrant a brief investigation into the other three industrial revolutions as well.

2. How might the Fourth Industrial Revolution impact *current* employees, employers, and the workplace?

3. What is the anticipated effect of the Fourth Industrial Revolution on *future* employees, employers and the workplace?

4. Should current laws be adapted to better suit the Fourth Industrial Revolution developments in the workplace, or is more than the law required to protect vulnerable employees?

1.3 Motivation / Rationale

As we are on the verge of transitioning from an already modern era to a more sophisticated one, one cannot help but sit back and wonder how this new leap will affect the current and future world of employment.

The First Industrial Revolution came into being due to the developments made in the textile and iron industry, the use of steam and other forms of power, and the adoption of factory systems in the middle of the 18th century.[5]

Through these developments and initiatives, the First Industrial Revolution brought about social and economic change, increased business and trade, laid the foundation for the creation of new machinery, and much more.[6] However, with these positive measures came adverse effects. Employers pushed employees beyond their limits, child labour increased, and cities became overpopulated.[7]

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5 Sorooshian and Panigrahi 2019: 904.
6 O'Brien 2017: 6 - 7.
7 Mohajan 2019: 383 - 384.

The First Industrial Revolution saw the rise of trade unionism as those employed desired more control over their work. Workers had to endure terrible working conditions on a daily basis, which were detrimental to their health and life. This led to these aggrieved workers forming trade unions to fight for a better work-life and working environment.[8]

The Second Industrial Revolution, which occurred late in the 19th century, added to that developed during the First Industrial Revolution. It brought electricity, chemical industries (and their chemical products), electronic communications technology, and alloys.[9]

These inventions made people's lives much more convenient and increased productivity in many countries.[10] However, those employed continued to work for long hours in horrible conditions, living conditions deteriorated, and many companies suffered at the hands of debt.[11]

Trade unions started expanding across different industries during the Second Industrial Revolution, all aiming to promote better working conditions and eradicate continued exploitation.[12] The Knights of Labour was one of the most important unions during this period in that it was one of the few that had no restrictions on its membership.[13]

The Third Industrial Revolution brought automation and digitization to the table with the help of electronics, computers, the Internet, and new communication technologies in the middle of the 20th century.[14]

The Third Industrial Revolution paved the way for new innovations, which in turn created new types of jobs, such as software engineers and IT specialists. However, it also resulted in the loss of many other jobs due to implemented robots and computers capable of performing human tasks, such as agricultural activities.[15]

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8 Montagna 2009: 9.
9 Kurt 2019: 592.
10 Agarwal and Agarwal 2017: 1063 - 1064.
11 Mohajan 2020: 11.
12 Pelz 2016: 85.
13 Mohajan 2020: 10.
14 Moll 2021: 14 – 15.
15 Sihlongonyane, Ndabeni and Ntuli 2020: 7.

The Fourth Industrial Revolution, built on the developments of the Third Industrial Revolution, is not far from imposing its full effect.[16] It will be accompanied by innovations ranging from artificial intelligence and cloud computing to 3-D printing and augmented reality.[17] The impact of the Fourth Industrial Revolution will stretch as far as the four corners of the earth and cause multiple disruptions, especially in the world of work. It is predicted that new types of jobs will be ushered in, and current ones will evolve, requiring individuals to either upskill or reskill.[18] Unfortunately, the Fourth Industrial Revolution will also lead to the downfall of many jobs and the replacement of humans in others.[19] This begs the question of whether our current labour laws are relevant and sufficient to protect employees during this period.

Each of the previous industrial revolutions left their mark on society and, inadvertently, the workplace. The First Industrial Revolution with steam power and the factory system, the Second Industrial Revolution with electricity and chemicals, and the Third Industrial Revolution with automation and digitization. The question now is what possible impact, or how would the Fourth Industrial Revolution impact, the current and future world of employment. This mini-dissertation is centred on this question. It explores the possible impact of this new industrial revolution, specifically referring to current and future employees and employers. Will it be more advantageous than disadvantageous to the latter parties, or will it be the other way around? This is the question that concerns many, including me.

1.4 Overview of Literature/ Main Sources

Explaining the different industrial revolutions

Before we look at the Fourth Industrial Revolution, we first have to familiarize ourselves with the other three previous industrial revolutions.

The First Industrial Revolution, also known as the Industrial Revolution, came into effect during the late stages of the 1700s. Prior to the Industrial Revolution, humans

16 Marengo 2019: 324.
17 Kurt 2019: 593.
18 Kayembe and Nel 2019: 81 – 82.
19 Morgan 2019: 376.

relied on themselves and animals to perform daily tasks.[20] This all changed when the Industrial Revolution came into being. The Industrial Revolution saw the rise of socialism and capitalism.[21] Machines were developed, which lessened the workload on humans and animals, improvements were made to the textile and iron industries, and the use of steam power and steam engines emerged.[22]

What impact did these developments have at that time? On the plus side, it improved the lives of many, increased employment opportunities, improved transportation and communication, and mechanised production with the help of steam power. On the downside, those employed worked for long hours in terrible conditions, children were obliged to perform labour duties, cities became overpopulated, and inequality was portrayed in many areas.[23]

The Second Industrial Revolution, also known as the Technological Revolution, commenced in the middle of the 19th century.[24] It improved many things, such as transportation and steel, and it also gave rise to electricity, electronic communication technology, and paper.[25]

What impact did this industrial revolution have at that time? The Technological Revolution improved living conditions even more, bettered public health and medicine and gave rise to mass production in many countries. However, the Technological Revolution also brought unemployment, debt and subjected workers to unhealthy and unsafe working conditions for long hours.[26]

The Third Industrial Revolution, also known as the Digital Revolution, commenced in the late 1960s. The Digital Revolution saw the rise of the Internet, computing, and advanced telecommunications.[27]

Under these new developments, companies had to adjust their operating methods to maintain or increase their productivity.[28] Multiple new types of jobs aligning with the

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20 Waghid, Waghid and Waghid 2019: 2.
21 Mohajan 2019: 382.
22 Sihlongonyane, Ndabeni and Ntuli 2020: 3.
23 Mohajan 2019: 383 – 384.
24 Roberts 2015: 1.
25 Mokyr and Strotz 1998: 2 - 12.
26 Mohajan 2020: 11.
27 Popkova, Ragulina and Bogoviz 2018: 25.
28 Smith 2001: 2.

needs of these developments started emerging, and further breakthroughs in science and research were achieved.[29] However, at the same time, it also contributed to the growth of unemployment numbers and inflicted more environmental damage to an already suffering environment.[30]

The Fourth Industrial Revolution, also known as Industry 4.0, is the next industrial revolution in line to further develop the world of work. This industrial revolution stems from the technologies and infrastructures of the Digital Revolution.[31] Through these technologies and infrastructures, and some improvements to it, the Fourth Industrial is set to introduce artificial intelligence, nanotechnology, robotics, blockchain, cloud computing and much more.[32]

The Fourth Industrial Revolution will bring a great set of new possibilities but also some despair. For example, with automation, employers/companies can reduce labour costs, resulting in an increase in capital/profit. However, automation poses a threat to many employees because, in some occupational areas, the human element will no longer be of use.[33] The Fourth Industrial Revolution is destined to blur the lines between physical, digital and biological realms.[34]

The (*possible*) impact of the fourth industrial revolution on *current* employees, employers and the workplace

The Fourth Industrial Revolution is said to disrupt the world of employment mainly through automation and artificial intelligence (AI). These two developments are intended to be used in a manner that enables computers and robots to perform labour tasks that are performed predictably or repetitively by humans.[35] Though we are not entirely in that phase yet, the works of the Fourth Industrial Revolution are evident in some parts of today's work environment. For example, with the help of new technology, some companies are able to have their employees conduct duties remotely.[36] This new arrangement became very resourceful during COVID-19 and has

29 Roberts 2015: 4.
30 Rani and Grimshaw 2019: 577.
31 Bhattacharyya and Mitra 2020: 851.
32 Ally and Wark 2020: 11.
33 Beliz, Basco and de Azevedo 2019: 6.
34 Pauceanu, Rabie and Moustafa 2020: 272.
35 Eberhard *et al* 2017: 50.
36 Dhanpat *et al* 2020: 7.

since seen a resurgence in implementation by multiple companies globally.[37] This is beneficial to employees because they have more freedom and a fonder working environment. Companies also benefit from this because productivity usually increases if employees are in a stress-free environment.[38] Another example is the existence of jobs that humans perform with the help of algorithms.[39]

One of the major concerns is the pool of skilled individuals capable of performing new types of jobs. This pool is relatively small, and if not attended to, it will lead to a problematic future for many. Those already made vulnerable by previous industrial revolutions will be at risk of becoming even more vulnerable during the Fourth Industrial Revolution if no improvement measures are taken.[40]

Even though we are still transitioning, employees and employers have no better time than now to prepare for what is anticipated.[41] With advanced technology being the driving force behind this new industrial revolution, it is crucial for employees to acquire the necessary skills and knowledge and for employers to adopt new business approaches and measures to thrive during this period.[42] With reference to a quote from a passage, *"The fourth industrial revolution will reach its full flower not under the guidance of today's management using yesterday's ideas, but tomorrow's leaders finding novel ways to integrate, optimize, and refine all aspects of life in the digital and physical worlds to which they hold dual citizenship*."[43]

The (*possible*) impact of the fourth industrial revolution on *future* employees, employers and the workplace

As mentioned in the previous chapter, the Fourth Industrial Revolution is more significant than the previous industrial revolutions because of the velocity, breadth, depth, and system impact it set to come with. The technology of this industrial revolution will affect employment in two possible ways. The first is where it is utilized in a manner that causes employees to become unemployed, and the second is where

37 Boland, De Smet, Palter and Sanghvi 2020: 2.
38 Flores 2019: 40.
39 Rotatori, Lee and Sleeva 2021: 94.
40 Sutherland 2020: 234 – 235.
41 Postelnicu and Calea 2019: 199.
42 Balalle and Balalle 2019: 151 – 152.
43 Murphy "How to Prepare for the Fourth Industrial Revolution", https://planergy.com/blog/how-to-prepare-for-the-fourth-industrial-revolution/ (accessed on 17 June 2021).

it is utilized to form new types of jobs.[44] For example, with automation, we are already witnessing some jobs losing their human element. However, we are also witnessing the emergence of jobs in place to maintain automation.[45]

Most of the jobs in the Fourth Industrial Revolution will require individuals to have technological, computer or engineering-related skills.[46] In addition, problem-solving, social, cognitive, and critical thinking skills will also be in high demand.[47] Current and future employees should subject themselves to upskilling and reskilling to avoid being left behind. This means that employees who already have technological, computer, or engineering-related skills should acquire a skill different from what they already have, and those who do not have any skills should develop skills.[48]

Higher educational institutions are expected to provide individuals with the necessary tools to upskill and reskill.[49] However, Africa's educational system does not fulfil this expectation entirely, thus requiring individuals to self-help themselves with these skills or rely on others to provide them with the tools to develop them.[50] As much as employees are required to develop, employers will also have to develop how they conduct business.[51] The consumers of tomorrow will have higher expectations and higher demands. With multiple companies resorting to online platforms, those who are still stuck in the old ways should develop or reconsider their business approaches to avoid losing consumers.[52]

Should current laws be adapted to better suit the Fourth Industrial Revolution developments in the workplace, or is more than the law needed to protect vulnerable employees?

With reference to the previous sections, it is evident that the Fourth Industrial Revolution is set to take the world by storm. It is predicted to change our lives and our perspective on various things, too. Consequently, does this mean that our laws are

44 Schwab 2016: 36.
45 Fernández-Macías 2018: 16 – 17.
46 Rotatori, Lee and Sleeva 2021: 94.
47 Waghid, Waghid and Waghid 2019: 3.
48 Marivate, Aghoghovwia, Ismail, Mahomed-Asmail and Steenhuisen 2021: 2.
49 Eberhard *et al* 2017: 50.
50 Marivate, Aghoghovwia, Ismail, Mahomed-Asmail and Steenhuisen 2021: 2.
51 Balalle and Balalle 2019: 151.
52 Schwab 2016: 50.

also destined to change? I am afraid so.[53] The Fourth Industrial Revolution will give rise to new and even more significant legal challenges than before. Therefore, legislative measures must be taken by introducing new rules and policies and amending existing ones. This is to prevent technology and its owners from causing undesirable disruptions in the world of employment and to promote protection afforded to workers.[54]

Luckily, change does not come as something new. The legal profession has been changing with every industrial revolution. For example, when the Internet was introduced in South Africa in 1991, the government enacted the Electronic Communications and Transactions Act[55] to regulate activities done via the Internet.[56] The only problem is that the Act was introduced ±10 years later. Another example is the Protection of Personal Information Act[57] , which has been proportionately effective until now. The Fourth Industrial Revolution will impose more changes at a more rapid rate than the previous industrial revolutions. The government should, therefore, react to these changes faster than before or risk loopholes being discovered and exploited under the law.[58]

1.5 Method / Approach

In writing this mini-dissertation, I will follow a desktop approach consisting of reading, analysing, writing, re-reading, re-thinking and re-writing. By following this approach, I will gain a broader understanding of the subject matter at hand and be able to answer pending questions.[59] To achieve this, I will use a few theoretical approaches, starting

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53 Leite "Is the law as we know it still fit for purpose?", https://www.weforum.org/agenda/2016/01/the-rule-of-law-and-the-fourth-industrial-revolution/ (accessed on 30 June 2021).

54 Maharaj 2020: 252 – 254.

55 25 of 2002.

56 Leite "Is the law as we know it still fit for purpose?", https://www.weforum.org/agenda/2016/01/the-rule-of-law-and-the-fourth-industrial-revolution/ (accessed on 30 June 2021).

57 4 of 2013.

58 Sutherland 2020: 235.

59 Sileyew "Research Design and Methodology", https://www.intechopen.com/chapters/68505 (accessed on 10 September 2023).

with a historical approach, then moving on to a descriptive approach and then lastly, an analytical approach.[60]

The historical research approach will assist me in determining the origin of each industrial revolution to equip me with a better understanding of their developments. The descriptive research approach will assist me in putting the Fourth Industrial Revolution in perspective by identifying and describing its characteristics and traits. Lastly, the analytical research approach will assist me in determining the extent to which the Fourth Industrial Revolution is predicted to influence the world of employment going forward.

In order to succeed with these research approaches, I will use information derived from various academic and non-academic sources. These include books, legislation, articles, international bodies and internet sources. In addition, I will also make use of information published on online platforms. These sources will only be used as far as they are applicable and relevant to the subject matter.

1.6 Structure/Outline

Chapter 1: Introduction and general orientation to the dissertation

In this chapter, I will follow the general structure of the LLM dissertation in creating a brief overview of the mini-dissertation to follow, as well as an explanation of the chapters included in the mini-dissertation, as was done in this chapter.

Chapter 2: Explaining the different industrial revolutions

In this chapter, I will be examining the build-up to the Fourth Industrial Revolution. This will represent the brief historical part of this mini-dissertation. I will be discussing each of the previous three industrial revolutions, with a focus on the effects thereof on the world of employment. This will include the inventions that changed the modus operandi during that period and the overall impact each industrial revolution had during its time of enforcement and afterwards.

[60] Walliman 2011: 9 – 13.

Chapter 3: The (*possible*) impact of the fourth industrial revolution on *current* employees, employers and the workplace

In this chapter, I will examine the possible impact the Fourth Industrial Revolution will have on those who are already employed, their employers, and the workplace. I will determine whether these impacts are of a good nature to the employees and employers or if they run the risk of subjecting them to hardship. The workplace will also be considered because it, too, will undergo tremendous change.

Chapter 4: The (*possible*) impact of the fourth industrial revolution on *future* employees, employers and the workplace

In this chapter, I will examine the anticipated impact the Fourth Industrial Revolution might have on those yet to be employed and the employers of that time. Like the previous chapter, I will determine whether these anticipated impacts will benefit employees and employers or if it will be the opposite of that.

Chapter 5: Should current laws be adapted to better suit the Fourth Industrial Revolution developments in the workplace, or is more than the law needed to protect vulnerable employees in the Fourth Industrial Revolution?

In this chapter, I will examine our current labour legislation and other legislation applicable to employment to determine whether these legislations are adequate to deal with the changes that are set to come with the Fourth Industrial Revolution. This chapter will give great attention to vulnerable employees as they will most likely be the most affected by the Fourth Industrial Revolution.

Chapter 6: Conclusion and Recommendations

In this chapter, I will address my primary research question, namely: “Do current labour laws sufficiently provide for the impact of the Fourth Industrial Revolution in the modern South African workplace?” by drawing a conclusion based on all of the secondary research questions of the mini-dissertation.

Furthermore, I will make some recommendations on how the current and future labour force of South Africa can prepare themselves going forward for that which the Fourth Industrial Revolution is anticipated to bring about.

The following chapter will allude to the different industrial revolutions and serve as background in answering the research questions discussed in this chapter.

CHAPTER TWO: EXPLAINING THE DIFFERENT INDUSTRIAL REVOLUTIONS

2.1 Introduction

Since the 18th century, the world has witnessed the coming and going of different types of industrial revolutions. Each of these industrial revolutions has caused some form of disruption, varying from industry to industry.[61] Today, we are on the verge of transitioning into a new industrial revolution known as the Fourth Industrial Revolution (4IR). Before we investigate this new industrial revolution, we must first familiarize ourselves with the previous industrial revolutions to put the Fourth Industrial Revolution into perspective.

2.2 The First Industrial Revolution

The First Industrial Revolution occurred in Great Britain during the late stages of the 18th century.[62] It came into being through the combination and utilization of technologies of prior centuries.[63] Before the First Industrial Revolution, humans had to rely on their own abilities and that of animals to perform daily tasks and secure a livelihood.[64] This all changed when the First Industrial Revolution started to take effect. The shift from biomass energy to fossil fuel energy opened doors for innovations.[65] Humans and animals were gradually relieved from some labour as new developments came to light.[66] This industrial revolution also saw developments in the textile, iron, and transportation industries.[67] The use of steam power and steam engines also emerged during this period.[68]

The textile industry was revolutionized by three inventions: James Hargreaves's spinning jenny, Sir Richard Arkwright's water frame, and Samuel Crompton's spinning mule.[69]

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61 Stearns 2020: 1 - 2.
62 Russell 2006: 101.
63 Ionescu 2018: 184.
64 Mohajan 2019: 377.
65 Sihlongonyane, Ndabeni and Ntuli 2020: 3.
66 Belot 2020: 2.
67 Roberts 2015: 1.
68 Okoye, Ogbu and Ome 2020: 68.
69 Mohajan 2019: 380.

Agarwal states that the shift from biofuel to fossil fuel resulted in an improvement in the iron industry. The production process required less labour, and a new and improved method of smelting iron emerged from this transition. During this period, the demand for iron increased, and the price thereof decreased.[70]

Prior to the Industrial Revolution, transportation infrastructure was inferior, costly, and unreliable.[71] This, in turn, had a damaging effect on the then economy. However, with the commencement of the Industrial Revolution, this all took a turn for the better. The transportation infrastructure underwent improvement, the design of ships and navigation techniques evolved, and changes to vehicles were put into place.[72]

Arguably, the steam engine was the best invention to come out of the First Industrial Revolution. English inventor Thomas Newcomen invented a steam engine called the "atmospheric steam engine". This steam engine was commonly used to pump water out of mine shafts.[73] Sixty years later, a mechanical engineer named James Watt took Newcomen's "atmospheric steam engine" and modified it. Watt was able to create a steam engine that produced more power more efficiently.[74] These steam engines enabled various industries to flourish and new inventions, such as steam locomotives, to emerge.[75] Thanks to the variety of steam engines, humans could now travel further and faster and conduct less labour without adversely affecting the production numbers.[76]

What impact did the First Industrial Revolution have at that time? For starters, the inventions that accompanied the First Industrial Revolution made people's lives much easier and more convenient.[77] The First Industrial Revolution also created new types of jobs, which paid good wages and improved labour productivity through mechanization.[78]

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70 Agarwal and Agarwal 2017: 1063.
71 Kras 2004: 9 - 10.
72 Alvarez-Palau, Bogart, Satchell and Taylor 2020: 7 - 8.
73 Gibbs 2009: 7 - 8.
74 Mohajan 2019: 377 - 378.
75 Agarwal and Agarwal 2017: 1064.
76 Montagna 2009: 6.
77 Roberts 2015: 1.
78 Philbeck and Davis 2019: 19.

However, not all was sunshine and rainbows. The expansion of factories in cities and the rise of new opportunities saw people flock to the nearest city in search of a better life. As a result, cities became overpopulated, leading to all sorts of pollution.[79] Despite the employees' wages not equating to the number of hours worked and the conditions they had to do it in, they remained tolerant and endured in order to avoid losing their jobs.[80] Child labour also increased because employing children rather than adults costs employers less.[81]

Before the First Industrial Revolution, governments had little to no say over the working conditions of those who were employed. This meant that employers could exploit employees however they wanted to, without the slightest concern over their well-being.[82] When the First Industrial Revolution took effect, employees saw it as the perfect time to establish movements to fight against exploitation and demand better working conditions. That, in turn, led to the idea of trade unions.[83] Employees fought tooth and nail, even going up against authorities, to get what they wanted, which included higher wages and fewer working hours.[84]

2.3 The Second Industrial Revolution

The Second Industrial Revolution, also known as the Technological Revolution, replaced the First Industrial Revolution in the middle of the 19th century.[85] The Technological Revolution improved some of the ideas of the First Industrial Revolution and introduced a number of changes on its own.[86] These include advancements made in steel, communication, and transportation industries and the introduction of electricity and the internal combustion engine.[87]

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79 Montagna 2009: 7.
80 FCPS HS Social Studies "Social Effects of the Industrial Revolution (1800-1920)", https://www.lcps.org/cms/lib4/VA01000195/Centricity/Domain/10599/Social%20Effects%20of%20the%20Industrial%20Revolution.pdf (accessed on 23 July 2021).
81 Montagna 2009: 3.
82 Mohajan 2019: 382.
83 Deane 1979: 160.
84 Mohajan 2019: 382.
85 Mokyr and Strotz 1998: 1.
86 Bloom *et al* 1958: 7.
87 Vickers and Ziebarth 2019: 12.

The Technological Revolution saw the rise of the steel industry. This was all thanks to an English inventor named Henry Bessemer.[88] With the help of his invention, the Bessemer converter, the process of making steel became easier. This new process gained a reputation, resulting in steel being high in demand and common in usage.[89] Industries such as construction and transportation benefitted from this new approach to steel.[90] Railroads were no longer made of iron but instead steel. This is because steel proved to be more advantageous than iron. Shipbuilders also started using steel to build new ships.[91]

The Technological Revolution also witnessed developments in the paper industry, the rise of new energy sources, new inventions added to transportation, and the launch of new communication modes.[92]

During this period, the paper industry had new inventions added to its calibre. Firstly, the Fourdrinier brothers of Great Britain invented the first modern paper machine, whose operating principles of moving woven mesh to create a continuous paper web are still in use to this day.[93] Secondly, Charles Fenerty and Friedrich Gottlob Keller established a new way of creating paper.[94] This new process involved the removal of fibres from wood (pulping) and utilizing it to produce paper.[95] However, Friedrich Gottlob Keller sold the license to the idea first, beating Charles Fenerty to the royalties thereof.[96]

New energy sources, namely oil, gas, petroleum and electricity, emerged from the Technological Revolution.[97] Out of the above, electricity was arguably the stand-out source.[98] Developed by Michael Faraday, electricity took the world by storm and

88 Bloom *et al* 1958: 8.
89 Agarwal and Agarwal 2017: 1063.
90 Hillstrom and Hillstrom 2005: 38.
91 Mokyr and Strotz 1998: 3.
92 Roberts 2015: 1 - 2.
93 Haunreiter 1997: 88.
94 Zabawski 2017: 6.
95 Mohajan 2020: 6.
96 Florek 2017: 11.
97 Evsyukov 2019: 86.
98 Kayembe and Nel 2019: 81.

changed it forever. Its impact expanded over several industries, including life in general.[99] Today, electricity is one of the essential elements of modern life.[100]

The world of transportation also experienced improvement after Nikolaus Otto invented the internal combustion engine in the late 1800s.[101] This engine was used in motorcars, motorcycles, and later, aeroplanes.[102]

The modes of communication were boosted with two innovations, the telephone and the radio. Alexander Graham Bell invented the famous telephone in 1876, and Guglielmo Marconi commercialized radio 25 years later. These two innovations laid the foundation for what we have today.[103]

What impact did the Technological Revolution have at that time? For starters, it improved the lives of people even more. They now had access to better transportation, better communication methods, adequate public health and improved medicine.[104] Concerning the world of work, employers enjoyed the fruits of electricity as it allowed factories to manufacture more products at a faster rate.[105] Employees also had less labour to conduct because mechanisation reduced the strain and made work more manageable.[106]

However, as much as the First Industrial Revolution created multiple employment opportunities, the Technological Revolution ended a lot of them. The improvements made to machines eliminated the human element in many factory jobs, which, during the First Industrial Revolution, was the hunting ground for a better life.[107] Those lucky enough to remain employed still had to endure working long hours in terrible conditions and receive low wages as payment.[108]

One would have thought that working conditions would improve going into the Second Industrial Revolution, but that was not the case. Employees still had to work long hours

99 Agarwal and Agarwal 2017: 1064.
100 Zohuri 2016: 1.
101 Bloom *et al* 1958: 9.
102 Mohajan 2020: 8 - 9.
103 Agarwal and Agarwal 2017: 1065.
104 Mohajan 2020: 11.
105 Kayembe and Nel 2019: 81.
106 Greenwood 1999: 9.
107 Evsyukov 2019: 86 – 87.
108 Mohajan 2020: 11.

in horrible conditions for low wages.[109] This necessitated the intervention of trade unions again. The Second Industrial Revolution saw the multiplication of trade unions across various industries.[110] All of them had the same goals: to reduce working hours to eight hours per day, eliminate child labour and make workplaces safer. Like in the First Industrial Revolution, these demands were not easily met. Workers had to go the extra mile to obtain them. Unions such as The Knights of Labour and the American Federation of Labour were common during the Second Industrial Revolution.[111]

2.4 The Third Industrial Revolution

The Third Industrial Revolution, also known as the Digital Revolution, commenced during the late stages of the 20th century. The Internet, new electronics, and advanced telecommunications are some of the innovations that emerged from it.[112]

Through the combination of electronics and computing, inventors were capable of implementing automation and digitization into production.[113] The introduction of autonomous machinery saw an increase in the rate of both production and economic activity but did so at an unfavourable cost.[114] Because these machines could now perform some of the tasks usually performed by humans, the need for humans became obsolete, expanding the pool of unemployment.[115] Even though automation and digitization have led to new types of jobs, especially in electronics, they have not been sufficient to make up for the unemployment numbers they have caused, especially in the manufacturing industry.[116]

The Internet is arguably the most notable invention of the Third Industrial Revolution.[117] Its initial use was to transfer bytes or exchange information between two terminals. However, with the development of electronics and telecommunications, the Internet became more than that. Today, the Internet is another way of

109 Mohajan 2020: 9.
110 Boyer 1988: 328.
111 Mohajan 2020: 10.
112 Taalbi 2019: 1126 - 1127.
113 Sihlongonyane, Ndabeni and Ntuli 2020: 7.
114 Evsyukov 2019: 88.
115 Rifkin 2011: 14.
116 Rifkin 2011: 274 - 275.
117 Smith 2019: 2.

communicating and entertaining oneself, and it provides a different approach to education, health and even labour.[118] This invention has been greatly welcomed in the world of employment. Not only has it provided employers with an easier way of recruiting, but it has also made the process of searching for available vacancies faster and easier for unemployed/employed individuals.[119]

The Digital Revolution saw significant strides being made in the telecommunications industry.[120] Not only do the majority of the world's countries have access to phone services, but developments in cable-based and wireless telecommunications were also made.[121] These enabled individuals and businesses to communicate without borders and conclude economic transactions differently.[122]

So, what impact did the Digital Revolution have? On the upside, this industrial revolution brought into existence new types of jobs, such as IT specialists and software developers.[123] It also paved the way for biotechnology and improved the process of production through factory automation.[124]

On the downside, the Digital Revolution has caused severe environmental issues, such as overpopulation and pollution, which are still visible today.[125] Like the previous industrial revolutions, this industrial revolution has also added numbers to the pool of unemployment.[126] In specific employment sectors, machines replaced humans, and having the necessary skills to either keep or find a job became worrisome for those who did not have these skills.[127] This issue is set to prolong into the Fourth Industrial Revolution, further increasing job losses and playing on the vulnerability of current and future employees.[128]

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118 Dentzel "How the Internet has changed everyday life", https://www.bbvaopenmind.com/en/articles/internet-changed-everyday-life/ (accessed on 27 July 2021).
119 Stevenson 2006: 2.
120 Russell 2006: 101.
121 Smith 2019: 6.
122 Peterson 2008: 4.
123 Dhéret, Guagliardo and Palimariciuc 2019: 11.
124 Taalbi 2019: 1127.
125 Jänicke and Jacob 2009: 10.
126 Sihlongonyane, Ndabeni and Ntuli 2020: 7.
127 Greenwood 1999: 10 - 11.
128 Man and Man 2019: 304.

It is estimated that by 2030, 75 million to 375 million employees will have been replaced by machines (automation).[129] This estimation dates back to 2013 when the World Bank's 2013 *World Development Report* concluded that from 2016 to 2030, the world economy would have to create 600 million new jobs to stabilise employment rates.[130] However, before availing such a vast number of jobs, it must first be ensured that individuals are skilled enough to perform these new and improved jobs.[131] This means that individuals must either upskill or reskill in order to accommodate these developments.[132] If not, they run the risk of being ousted by the 21st-century economy.[133]

2.5 The Fourth Industrial Revolution

The Fourth Industrial Revolution, also known as Industry 4.0, is not far from reaching its full effect. This is evident through the extent of how intertwined it has become with our daily lives.[134] This industrial revolution will use the previous industrial revolution as a platform from which it will build itself. In other words, the Fourth Industrial Revolution will use the technologies of the Third Industrial Revolution to formulate its own.[135] Some have argued that the Fourth Industrial Revolution forms part of the previous industrial revolution and not one on its own, but Professor Klaus Schwab has guaranteed us that this is, in fact, not the case.[136]

According to Schwab, three factors distinguish the Fourth Industrial Revolution from the Third: velocity, breadth and depth, and system impact.[137] Unlike previous industrial revolutions, the Fourth Industrial Revolution will develop at a more exponential than linear pace.[138] This comes from the interconnected world we currently live in and the continuous evolution of technologies.[139] Therefore, it is certain that the Fourth

129 Bertani, Raberto, and Teglio 2020: 330.
130 Raja and Ampah 2016: 2.
131 Spöttl and Windelband 2021: 32.
132 Ninan, Roy and Thomas 2019: 782-783.
133 Reaves 2019: 8 – 9.
134 Tien 2012: 279.
135 Philbeck and Davis 2019: 18.
136 Schwab 2016: 9.
137 Postelnicu and Calea 2019: 197.
138 Xu, David and Kim 2018: 91.
139 Schwab "The Fourth Industrial Revolution: what it means, how to respond",

Industrial Revolution will disrupt multiple industries across the globe and impact economies, businesses, societies and individuals.[140] Developed countries have already started adopting the Fourth Industrial Revolution, while developing countries such as South Africa are still stuck in older industrial revolutions.[141]

From the Fourth Industrial Revolution, artificial intelligence (AI), the Internet of Things, advanced robots, 3D printing, driverless vehicles, and many more new technologies will emerge.[142] These new innovations will allow the Fourth Industrial Revolution to blur the lines between the physical, digital and biological realms.[143] We could witness breakthroughs in nanotechnology and gene sequencing, have products customized to our liking before they undergo manufacturing, and even have computers driving our vehicles for us.[144]

Other than the impact the Fourth Industrial Revolution is set to have on the world of employment, it will alter the way we live and connect with people and things around us.[145] The innovations of the Fourth Industrial Revolution will improve the quality of life and make the living thereof much more effortless.[146] We are already living in a world where transport can be arranged, products can be purchased, and payments of any sort can be made without having to get out of the house.[147] The Fourth Industrial Revolution will also play a hand in global economic growth and could assist the poor in searching for a better life by providing them with digital technologies capable of exposing them to endless information and opportunities.[148] However, the Fourth Industrial Revolution could result in even greater inequality, especially concerning

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https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/ (accessed on 11 August 2021).

140 Marivate, Aghoghovwia, Ismail, Mahomed-Asmail and Steenhuisen 2021: 1.

141 Olaitan, Issah and Wayi 2021: 1 – 2.

142 Deloitte "The Fourth Industrial Revolution: At the intersection of readiness and responsibility", https://www2.deloitte.com/ch/en/pages/risk/articles/industry-4-0-intersection-of-readiness-and-responsibility.html (accessed on 15 March 2021).

143 Moll 2021: 24.

144 Marengo 2019: 328.

145 Magwentshu, Rajagopaul, Chui and Singh 2017: 11.

146 Sihlongonyane, Ndabeni and Ntuli 2020: 12.

147 Schwab "The Fourth Industrial Revolution: what it means, how to respond", https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/ (accessed on 11 August 2021).

148 Ndung'u and Signe "The Fourth Industrial Revolution and digitization will transform Africa into a global powerhouse", https://www.brookings.edu/research/the-fourth-industrial-revolution-and-digitization-will-transform-africa-into-a-global-powerhouse/ (accessed on 12 August 2021).

employment and other socio-economic factors, social unrest and breach of privacy.[149] This stresses the need to create or amend laws to protect those left vulnerable to possible exploitation.

Through its technologies, the Fourth Industrial Revolution is expected to change the world of work in a substantial manner. With Artificial Intelligence (AI) and automation at the forefront, the Fourth Industrial Revolution will disrupt a vast number of industries, creating new types of jobs but also resulting in the loss of many others.[150] It is estimated that more than half of the children currently entering primary school will be in occupations that are non-existent in today's world.[151] Studies have estimated that the adoption of AI and automation will impact close to one-fifth of the current global workforce and could see robots replace up to 800 million workers in 2030.[152] This raises the question as to who will be "immune" against the disruptions of the Fourth Industrial Revolution and who will not.

It is believed that highly skilled individuals, individuals who perform jobs involving complex human relationships, such as therapists, individuals whose job is to provide education and training, and individuals responsible for the repair and maintenance of new technologies, are in safe hands.[153] However, those who are unsafe include minimally skilled individuals, individuals performing jobs that are predictable or done in a pattern, such as telemarketers, and individuals who work in construction.[154]

A further discussion on individuals and jobs more likely and those less likely to be vulnerable during the period of the Fourth Industrial Revolution will be found in both chapter 3 and chapter 4.

In the Fourth Industrial Revolution, we will most likely see a vast number of companies resort to remote work.[155] The COVID-19 Pandemic has forced companies into a situation where they had to adopt a new technological approach to conducting

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149 Mfanafuthi, Nyawo and Mashau 2019: 13879.

150 Zervoudi "Fourth Industrial Revolution: Opportunities, Challenges, and Proposed Policies", https://www.intechopen.com/chapters/70877 (accessed on 28 August 2021).

151 World Economic Forum 2016: 3.

152 Ungureanu 2019: 80.

153 Zervoudi "Fourth Industrial Revolution: Opportunities, Challenges, and Proposed Policies", https://www.intechopen.com/chapters/70877 (accessed on 28 August 2021).

154 Karr, Loh and San Andres 2020: 4.

155 Ungureanu 2019: 80.

business in order to keep their doors open.[156] The Fourth Industrial Revolution will also witness the rise of The Gig Economy. Described as *"the exchange of labour for money between individuals or companies via digital platforms that actively facilitate matching between providers and customers, on a short-term and payment-by-task basis*"[157], the Gig Economy will provide individuals with an alternative to standard employment, such as office work. Individuals can now perform different jobs for different "employers" on their own time and according to their own terms.[158]

2.6 Summary

In this chapter, it is evident that with the commencement of each industrial revolution, revolutionary innovations emerged, affecting the then environment both positively and negatively.

The First Industrial Revolution gave rise to developments that played a crucial role in the mechanization of production.[159] The Second Industrial Revolution saw electricity being incorporated into the workplace, which advanced many more industries.[160] The Third Industrial Revolution is signified through the emergence of the Internet, a fundamental element in today's everyday life.[161] Each of the three industrial revolutions had its benefits and detriments, with the same being expected from the Fourth Industrial Revolution. The Fourth Industrial Revolution stems from the technologies of the Third Industrial Revolution.[162] It is destined to improve the quality of life but, at the same time, will expose us to even greater threats than before.[163]

Some developed countries have already started adopting the Fourth Industrial Revolution, while developing countries such as South Africa lack the capabilities to do so. This means that South Africa is falling behind in the world of work and they lack the mitigating power of controlling the impacts expected from the Fourth Industrial

156 Boland, De Smet, Palter and Sanghvi 2020: 2.
157 Lepanjuuri, Wishart and Cornick "The Characteristics of Those in the Gig Economy", https://assets.publishing.service.gov.uk/media/5aa69800e5274a3e391e38fa/The_characteristics_of_those_in_the_gig_economy.pdf (accessed on 22 January 2024).
158 Cherry 2020: 3 - 4.
159 Prisecaru 2016: 57 - 61.
160 Mohajan 2020: 11.
161 Stevenson 2006: 2.
162 Prisecaru 2016: 61.
163 Xu, David and Kim 2018: 92 – 93.

Revolution.[164] The following chapter will identify the possible ways the Fourth Industrial Revolution will impact current employees, employers and the workplace.

[164] Olaitan, Issah and Wayi 2021: 8.

CHAPTER THREE: The *(possible)* impact of the Fourth Industrial Revolution on *current* employees, employers and the workplace

3.1 Introduction

With the Fourth Industrial Revolution looming on the horizon, concerns amongst employees and employers are filling the air as to how they might be affected by this inevitable change.[165] There is anticipated to be a significant increase in automation, replacement of the human workforce, new types of employment, and new ways of doing work in the next few years.[166] It is also anticipated that the Fourth Industrial Revolution will challenge protection afforded to employees, employers and the workplace by current labour-related laws.[167] A further discussion on this will be conducted in chapter 5.

Even though it is not that blatant today, current employees and employers should still take the initiative and prepare themselves for what is to come.[168] This includes upskilling or reskilling, adopting new business approaches and adapting to changing circumstances and demands.[169]

This chapter aims to identify the *possible* impacts of the Fourth Industrial Revolution on *current* employees and employers and how it could change the perspective of what a workplace could be. The impact on *future* employees and employers will only be discussed in the next chapter.

3.2 The *possible* impact on *current* employees

Current employees have not been fully exposed to the possible impacts of the Fourth Industrial Revolution as of yet. This is primarily due to the prematurity of the technologies that are associated with this new industrial revolution.[170] However, recent technological advancements have indicated that the move towards the newer

165 Morgan 2019: 372.
166 Cherry 2020: 1.
167 Hendrickx 2019: 366.
168 Spöttl and Windelband 2021: 29.
169 Man and Man 2019: 304 – 305.
170 Ungureanu 2019: 80.

industrial revolution is gradually underway.[171] For example, organisations are shifting more and more towards the automation of certain functions, robots are steadily being deployed to perform the work of humans, and remote work is gaining recognition.[172]

Nonetheless, what does all this mean for current employees and their future in the world of employment? It is predicted that the Fourth Industrial Revolution will be in favour of those who are vastly skilled and against those who are minimally skilled.[173] This comes as no surprise, seeing that the jobs of tomorrow, and those subject to alterations, will require skilled staff in order to be performed effectively.[174]

In a South African context, this is very distressing. This is because South Africa is known to have one of the most mismatched and unskilled labour forces globally.[175] Consequently, this leaves a significant number of employees as easy targets for potential exploitation and makes them more vulnerable to the possible impacts of the Fourth Industrial Revolution.[176] The Fourth Industrial Revolution will be technologically driven and is set to influence every aspect of employment. From the type of jobs to employment requirements and even the workplace itself will be impacted.[177] The COVID-19 period gave us a glimpse of how quickly technology can influence and be despatched in the world of employment.[178] Therefore, current employees must take it upon themselves or have their employers assist them in either upskilling or reskilling.[179] This is to decrease their vulnerability against this new industrial revolution and maybe even open doors to new possibilities the Fourth Industrial Revolution might present.[180]

3.3 The *possible* impact on *current* employers

171 World Economic Forum 2020: 8.
172 Corfe 2018: 29 – 30.
173 Man and Man 2019: 305.
174 Corfe 2018: 29.
175 Sutherland 2020: 234.
176 Okoye, Ogbu and Ome 2020: 69.
177 Min *et al* 2019: 401 - 402.
178 Boland, De Smet, Palter and Sanghvi 2020: 2.
179 Balalle and Balalle 2019: 151 – 152.
180 Corfe 2018: 29 – 30.

Similar to current employees, current employers have also not been greatly affected by the Fourth Industrial Revolution yet. This is because the phase in which the Fourth Industrial Revolution currently limits any possible impacts it might impose.[181] However, recent changes in the world of employment indicate that it will not be long before we see a breakthrough in these limitations.[182]

Over the past couple of years, employers have been met with technological developments that are strongly tied to the Fourth Industrial Revolution. This includes new ways of working in the form of the online platform economy and new working arrangements in the form of remote work.[183] These disruptions are challenging the nature of work and the idea of a workplace as predicted the Fourth Industrial Revolution would do.[184]

The Gig Economy is a platform-based labour market driven by modern digital technology.[185] Its low entry-level characterizes it and provides individuals with a new approach to finding work, an alternative to full-time employment and a new way of generating an income.[186] The Gig Economy includes services such as transportation provided by Uber and home services offered by TaskRabbit.[187] The Gig Economy affects employers in the sense that corporate loyalty is slowly fading because this new economy allows individuals to work for more than one employer at a time and allows individuals to be more flexible with their work hours and duration of employment. Consequently, this is causing individuals to run away from full-time employment.[188]

The Gig Economy is adding a new meaning to employment. It is forcing employers to re-think their approach to conducting business and how to remain relevant in an ever-changing labour market.[189]

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181 Spöttl and Windelband 2021: 32.
182 Brougham, Haar and Tootell 2019: 21 - 22.
183 International Labour Organisation “Work for a brighter future”, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_662410.pdf (accessed 27 August 2023).
184 de Ruyter, Brown and Burgess 2018: 37.
185 Woodcock and Graham 2020: 10.
186 de Ruyter, Brown and Burgess 2018: 38.
187 de Ruyter, Brown and Burgess 2018: 41.
188 Ungureanu 2019: 82 – 83.
189 Ungureanu 2019: 77.

Since the Third Industrial Revolution, the advancements in technology have paved the way for employers to incorporate technology into the workplace and find ways to benefit from it.[190] Employers did just that by developing the idea of performing work-related duties from a location other than the office, in other words, remotely.[191] This idea later became an immediate action for many when the COVID-19 virus brought the world of work to a halt.[192]

Despite still being far from adequately developed, remote work was put into immediate action to keep the employment world active.[193] In other words, to keep businesses running and employees employed.[194] This necessitated employers to make use of multiple software, such as Zoom, Skype, and Microsoft Teams, to conduct meetings and convey tasks to employees.[195] Even though it was a bit troublesome and something foreign for many at the start, employers and their employees later became used to this new way of working, with some even vouching for its permanent implementation going forward.[196]

Due to ongoing technological influence, current employers have also been required to up the ante in terms of workplace readiness.[197] This makes hiring competent individuals a tad more difficult for employers as present individuals are not entirely aligned with current workplace priorities.[198] In the end, this widens the existing skills gap issue faced by employers, which is expected to be more concerning in the near future with more and more technology being incorporated into businesses.[199]

3.4 The *possible* impact on the *current* workplace

190 Sihlongonyane, Ndabeni and Ntuli 2020: 7.
191 Olson 1983: 182 – 183.
192 Vyas and Butakhieo 2021: 60.
193 Lund, Madgavkar, Manyika and Smith 2020: 2.
194 Boland, De Smet, Palter and Sanghvi 2020: 2.
195 Ibrahim "The Fourth Industrial Revolution Combatting COVID-19: The Role of Smart and Sustainable Cities", https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/09/Maysoun-Ibrahim_4IR-and-SCs-in-the-Time-of-COVID19.pdf (accessed on 02 November 2022).
196 Adekoya, Adisa and Aiyenitaju 2021: 1417.
197 Nxumalo and Nxumalo 2021: 18.
198 McGunagle and Zizka 2020: 594.
199 Habiyaremye, Habanabakize and Nwosu 2022: 787.

Before the COVID-19 Pandemic, transitioning from an "office-centric" work environment to a more flexible one was a forethought for many organisations.[200] However, when the coronavirus surfaced, and the World Health Organization declared it a pandemic, these organisations were left with no other option but to bring that forethought into immediate action.[201] In this sense, the Fourth Industrial Revolution was hastened by the COVID-19 pandemic.[202]

Early in 2020, organisations across the globe were forced to close their doors in response to the coronavirus that was spreading rapidly across the world.[203] This caused unrest in the world of work as organisations now had to implement a new way of working to keep businesses running, keep employees employed, and adhere to the lockdown rules.[204] The only way this could happen was for organisations to incorporate technology into their way of work.[205] This meant that organisations had to use the available technologies to blur the lines between the physical office and places where work could actually be done. In other words, create a workplace outside the physical office**.** This, in turn, led to the implementation of *remote work.*[206]

Remote work, also known as work-from-home, refers to a flexible working arrangement that enables the labour force to work from a remote location outside corporate offices.[207] Initially a way of work associated with the future, the COVID-19 Pandemic demanded a present "experimental" run of this working arrangement.[208] This was no problem as the interconnected and advanced technological world we currently live in could accommodate this temporary transition.[209] Organisations could continue having meetings by using software such as Zoom or Microsoft Teams.[210]

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200 Vyas and Butakhieo 2021: 61.
201 Neto *et al* 2020: 1.
202 Koutroukis, Chatzinikolaou, Vlados and Pistikou 2022: 1.
203 Vyas and Butakhieo 2021: 59.
204 World Economic Forum 2020: 9.
205 NU Cepal 2021: 36.
206 Ozimek "The Future of Remote Work", https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3638597 (accessed on 20 May 2023).
207 Olson 1983: 182.
208 Lund, Madgavkar, Manyika and Smit 2020: 2.
209 Skilton and Hovsepian 2018: 22.
210 Ibrahim "The Fourth Industrial Revolution Combatting COVID-19: The Role of Smart and Sustainable Cities", https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/09/Maysoun-Ibrahim_4IR-and-SCs-in-the-Time-of-COVID19.pdf (accessed on 02 November 2022).

Employees and employers could continue communicating with one another and access company servers via other forms of digital collaboration.[211]

Now that the world is gradually returning to its old self, and some employers and employees are returning to their workplaces, a number of lessons arose from this "experimental run" of remote work. These include, by eliminating daily commuting employees have more time on their hands, flexibility is the bridge that leads to a better work-life balance, and having a distributive workforce that is effective is in fact, possible.[212] However, not all was sunshine and rainbows. Some employees have argued that, despite eliminating commuting expenses, remote work has increased many people's electricity bills and added internet costs to the monthly list of expenses. Remote work also interferes with the private lives of many, and employees can easily be distracted while performing their duties.[213]

Looking back, it can be concluded that the COVID-19 pandemic has accelerated the digitalization of workplaces. The idea has been in the works for years, but as a result of the pandemic, it had to be implemented immediately.[214] Organisations had to react swiftly in order to continue operating and refrain from causing further socio-economic damage.[215] Now that the outside world is much safer and people are able to return to the office, organisations should continue developing and accommodating this new working arrangement because it will be well sought after come the Fourth Industrial Revolution.[216]

3.5 Summary

Despite its prematurity in the world of employment, the Fourth Industrial Revolution's anticipated effects are increasingly evident.[217] This calls for employees and employers to equip themselves and implement the necessary measures to accommodate the change the Fourth Industrial Revolution is predicted to bring about. With reference to a quote from a passage, *"The fourth industrial revolution will reach its full flower not*

211 Boland, De Smet, Palter and Shanghvi 2020: 2.
212 Vyas and Butakhieo 2021: 64.
213 Vyas and Butakhieo 2021: 65.
214 Amankwah-Amoah, Khan, Wood and Knight 2021: 602 – 603.
215 ELAC 2021: 36.
216 World Economic Forum 2020: 16 – 18.
217 Caetano and Charamba 2017: 26.

under the guidance of today's management using yesterday's ideas, but tomorrow's leaders finding novel ways to integrate, optimize, and refine all aspects of life in the digital and physical worlds to which they hold dual citizenship."[218]

CHAPTER 4: The (*possible)* impact of the Fourth Industrial Revolution on *future* employees, employers and the workplace

4.1 Introduction

As mentioned earlier, the Fourth Industrial Revolution might not have shown its full effect and features as of yet, but that does not imply that the world of employment should ease off the preparation throttle. Rather than start preparing when it does, employees and employers should take the initiative and get to grips with the potential of the Fourth Industrial Revolution as early as possible.[219] Whether it is gradually implementing upskilling and reskilling programmes or testing out new working arrangements[220], as quoted by Malcolm X," *the future belongs to those who prepare for it today"*[221].

4.2 The *possible* impact on *future* employees

With the occurrence of each industrial revolution, employees were met with alterations which affected their position as employees. Their education and skills were brought to light from time to time, and they had to adapt to new working arrangements and displacements in some occupations.[222] The Fourth Industrial Revolution is predicted to head in the same direction but with a more significant effect.[223]

One of the core concerns raised when the Fourth Industrial Revolution is talked about is the readiness of employees. This includes their educational preparedness and skills variety.[224] With each industrial revolution, the prerequisites of employers change,

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218 Murphy "How to Prepare for the Fourth Industrial Revolution", https://planergy.com/blog/how-to-prepare-for-the-fourth-industrial-revolution/ (accessed on 17 June 2021).
219 Xu, David and Kim 2018: 92.
220 Man and Man 2019: 305.
221 History.com Editors "Malcolm X", https://www.history.com/topics/black-history/malcolm-x#quotes-by-malcolm-x (accessed on 11 September 2023).
222 Caetano and Charamba 2017: 27.
223 Caetano and Charamba 2017: 28.
224 Okoye, Ogbu and Ome 2020: 66.

requiring more and more from those who seek employment. For example, that which was enough to get you employed years ago is now merely a piece of the whole puzzle.[225]

The key to acquiring these prerequisites is with the assistance of higher educational institutions[226]. However, for the past few industrial revolutions, higher educational institutions have been slow to respond to what was required by the then-industrial revolution. This means that graduates have always been a step behind the changing labour market.[227]

With the Fourth Industrial Revolution at our doorstep, the probability of the same issue repeating itself is very high. We will most likely see the continuation of individuals leaving higher educational institutions with requirements meant for earlier industrial revolutions rather than for the present or future.[228] This is worrisome because it means that future employees are currently being equipped with teachings that will be less effective by the time they enter the world of employment.[229]

> As quoted by Nancy Gleason: *higher education has a crucial role to play in shaping the societal transitions necessary to adjust to the Fourth Industrial Revolution. But today's higher education was designed to meet the needs of past industrial revolutions with mass production powered by electricity. Those systems are not suited for the automation economy. Today's students (of all ages) are faced with major challenges in demographics, population (both growing and shrinking ones), global health, literacy, inequality, climate change, nuclear proliferation, and much more. As students today leave university, the Fourth Industrial Revolution world has significantly different demands on them than have previously existed*. [230]

With advanced technology such as artificial intelligence and automation at the forefront of the Fourth Industrial Revolution, promoting literacy and skills endorsing such technology will be a great start and a step in the right direction.[231] However, this will

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225 Gleason 2018: 7.

226 Higher educational institutions not only refer to universities that cater for undergraduate and postgraduate degrees but also institutions that teach and develop technical and vocational skills.

227 Waghid, Waghid and Waghid 2019: 3.

228 International Labour Organisation "Inclusive Future of Work Republic of South Africa", https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_732871.pdf (accessed on 23 April 2023).

229 Magwentshu, Chui, Rajagopaul and Singh 2019: 1.

230 Waghid, Waghid and Waghid 2019: 5.

231 Beliz, Basco and de Azevedo 2019: 7.

require higher education institutions to revamp their curriculum and restructure their educational approach. This is not only because it is not up to par with the needs of the Fourth Industrial Revolution but to provide solutions to the challenges or disruptions expected by the Fourth Industrial Revolution.[232]

Higher educational institutions should consider forming collaborative alliances with other educational institutions and private entities through private-sector partnerships.[233] The reason is that some educational institutions might have research relevant to the Fourth Industrial Revolution, which others do not and vice versa.[234] The input of private entities will also be highly beneficial as multiple already have disruptions, such as artificial intelligence and automation deployed in the labour market. This will provide future employees with first-hand experience and knowledge on how to adapt to the changing labour market.[235] Higher educational institutions should also look into investing more in online education. Many individuals cannot physically attend these institutions due to socio-economic challenges, depriving them of acquiring much-needed knowledge and skills.[236]

As quoted by Professor Tawana Kupe, vice-chancellor of the University of Pretoria, *"Universities in (South) Africa, as with their counterparts globally, are required to contribute to the advancement and development of their societies. This needs to be underpinned by teaching and learning strategies that create well-educated, socially conscious citizens who are equipped with skills for their era, in this case, the Fourth Industrial Revolution (4IR)."* [237]

However, with all this being said, one should not overlook the elephant in the room: educational inequality.[238] This social issue continues to be a thorn in the flesh of South Africa, causing a clear distinction between the rich and the poor.[239]

Often reiterated, individuals who hail from the privileged side of the equation tend to receive more qualitative education on a secondary level than those on the other

232 Akileswaran and Hutchinson 2019: 38.
233 Kayembe & Nel 2019: 91.
234 Marivate *et al* 2021: 2.
235 Lee *et al* 2018: 10.
236 Tengeh and Ogunlela 2021: 92 – 93.
237 Carrim 2022: 9.
238 Carrim 2022: 16.
239 Branson, Garlick, Lam and Leibbrandt 2012: 12.

side.[240] This creates an imbalance in society because the number of individuals fortunate schools produce who meet tertiary education standards outweighs those produced by less fortunate schools.[241] Those lucky enough to overcome this barrier and meet the standards of tertiary education often come across predicaments where they either fail to enrol or successfully enrol but fail to complete their studies at these institutions.[242] This is primarily due to issues relating to geographic and social circumstances.[243] Despite some provisions being put in place to assist individuals in overcoming these barriers, a few shortcomings have been experienced occasionally. For example, funds made available by financial aid are either paid too late or not in full, resulting in individuals being academically excluded.[244] This further promotes educational inequality in the sense that acquiring the necessary education and skills for future purposes is determined by social circumstances.[245]

In some cases, individuals have to take measures into their own hands by seeking employment in order to be financially adequate for tertiary education.[246] This is another shortcoming faced in that finding employment in a country such as South Africa, where the unemployment numbers are shocking, is like looking for a needle in a haystack.[247]

The severity of this educational issue is very alarming because many individuals are deprived of obtaining the much-needed education required to participate in the labour market.[248] As a result, they will find themselves in a vulnerable position once employed because jobs that require minimum to no higher education will most likely be adopted by artificial intelligence and automation.[249]

Education is an aspect that will play an essential role in future employees keeping their heads above water during the Fourth Industrial Revolution.[250] As previously mentioned, qualities to possess going into the Fourth Industrial Revolution include

240 Ngubane and Naidoo 2016: 238 – 239.
241 Chetty and Pather 2015: 1.
242 Ngubane and Naidoo 2016: 239.
243 Mseleku 2022: 254.
244 Jones, Coetzee, Bailey and Wickham 2008: 30.
245 Ngubane and Naidoo 2016: 252 – 253.
246 Jones, Coetzee, Bailey and Wickham 2008: 30 – 31.
247 Ngubane and Naidoo 2016: 244.
248 Kayembe and Nel 2019: 90.
249 Man and Man 2019: 305.
250 Beliz, Basco & de Azevedo 2019: 7.

literacy and skills relating to artificial intelligence and automation.[251] Those who have neither run the risk of limiting their options and placing themselves in a position of vulnerability, as these technologies are deployed to carry out jobs that require the least amount of doing and knowledge.[252]

As the Fourth Industrial Revolution looms, the importance of educational institutions is becoming clearer and clearer.[253] They are the driving force behind the preparation and shaping of future employees.[254] Failing to do so, we will most likely have a labour force that is unable to keep up or embrace the changes brought by the Fourth Industrial Revolution.[255]

Regarding employment skills, the Fourth Industrial Revolution will demand skills a bit differently than what was required in previous industrial revolutions.[256] Instead of primarily focusing on technologically related skills, the Fourth Industrial Revolution will be in search of skills that separate humans from technology, such as soft skills.[257] This ultimately means that jobs that cannot be performed by technology or are affected by artificial intelligence will be greatly sought after, and individuals who possess skills unmatched by technology will be in high demand.[258]

The Fourth Industrial Revolution is predicted to lean more towards skill sets than qualifications.[259] This, however, does not mean that education should be disregarded. In fact, education is still a very important aspect of employment, but it should not be the only aspect. This means that skills training should also be considered together with educational training. As quoted by Avogaro, "*a workplace that is more educated and less skilled might be limited to routine and poorly paid employment*".[260] Therefore, it is essential for future employees to find a harmonious balance between education and skills.[261]

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251 Anshari 2020: 4.
252 Kurt 2019: 595.
253 Eberhard *et al* 2017: 52 - 53.
254 Moloi and Mhlanga 2021: 1.
255 Kayembe and Nel 2019: 91 - 92.
256 Man and Man 2019: 303 – 304.
257 Adegbite and Adeosun 2021: 40.
258 Anshari 2020: 4.
259 Adegbite and Adeosun 2021: 40.
260 Wessels 2020: 62.
261 Elayyan 2021: 28.

So, what skills should tomorrow's employees pay attention to or acquire going into the Fourth Industrial Revolution? There are roughly four groups of skills common among the writers of the Fourth Industrial Revolution. These skills are intellectual skills, social skills, personal skills, and professional skills.[262]

Intellectual skills include problem-solving, critical thinking, creative thinking, cognitive, and interdisciplinary abilities. Social skills include communication, interpersonal, people management, negotiation, and cooperation abilities. Personal skills include time management, emotional intelligence, decision-making, and intrapersonal abilities. Lastly, professional skills include educational background, digital literacy, and analytical and language abilities.[263] Individuals who adopt these skills have a higher probability of being in demand in comparison to those who do not. They are also less likely to be ousted by technology as automation and artificial intelligence cannot acquire most of these skills.[264]

In addition to altering future employment requirements, the Fourth Industrial Revolution also looks to extend its influence on jobs. With some at risk of being infiltrated and automated by robots and artificial intelligence, others remain preserved against this technological wave.[265]

Jobs that are considered a high risk of falling victim to the hands of the Fourth Industrial Revolution and its technologies are jobs performed in a routine and repetitive manner and jobs that are predictable in nature. For example, bank tellers, telemarketers, office jobs, and postal related services, to name a few.[266] All of these jobs are capable of being executed by modern technology, thus restricting the need for the human element.[267]

On the other hand, jobs considered relatively safe from the influence of the Fourth Industrial Revolution are more complex than those categorized above. For example, jobs that rely on human interaction, such as installation and repairs, jobs that require interpersonal and intrapersonal skills, such as social workers and psychologists, and

262 Eberhard *et* al 2017: 53.
263 Adegbite and Adeosun 2021: 39.
264 Spottl and Windelband 2021: 43.
265 Meda 2019: 636 – 637.
266 Eberhard *et* al 2017: 50.
267 Morgan 2019: 377 - 378.

jobs that provide training and educational development, such as educators and training and development specialists.[268] These types of jobs rely more on the human element to be performed effectively.[269]

As a result of the progression made in technology over the past years, the concept of work and how it is performed has changed in multiple ways**.**[270] Under the Fourth Industrial Revolution, we can expect the blossoming of these developments, which includes new modes of employment as well as working arrangements.[271]

Expected to gain momentum going into the Fourth Industrial Revolution, gig work has become a common mode of employment in today's labour market.[272] From delivery and ride-hailing services to performing odd jobs for customers and providing temporary accommodation, individuals have capitalized on this mode of employment, which is expected to grow over the following years.[273]

Gig work introduces individuals to employment alternatives to standard employment, such as office work. It exposes them to factors not commonly associated with the latter type of employment.[274] For example, with gig work, individuals are not bound to one employer, meaning they can take up as much work from as many employers as possible. Gig Work has also established a working environment that promotes flexibility, allowing individuals to perform work wherever and whenever.[275] Since gaining prominence, individuals have either fully resorted to gig work or made temporary use of it in order to generate extra income.[276]

However, it is not all sunshine and rainbows when it comes to gig work. For example, gig workers do not enjoy the same benefits as full-time employees, making them vulnerable in many aspects.[277] They are also responsible for the expenses required to

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268 Kurt 2019: 597 – 598.
269 Zervoudi "Fourth Industrial Revolution: Opportunities, Challenges, and Proposed Policies", https://www.intechopen.com/chapters/70877 (accessed on 28 August 2021).
270 Pärli 2021: 1.
271 Dhéret, Guagliardo and Palimariciuc 2019: 10 - 11.
272 Balliester and Elsheikhi 2018: 19.
273 International Labour Organisation "Inclusive Future of Work Republic of South Africa", https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_732871.pdf (accessed on 23 April 2023).
274 Ungureanu 2019: 77.
275 Beghelli and Pareglio 2019: 3.
276 Neufend, O'Reilly and Ranft 2018: 119 – 120.
277 International Labour Organisation "Inclusive Future of Work Republic of South Africa",

perform their daily tasks, such as procuring transport to attend to tasks. In as much as it is flexible and convenient, gig work, like any other form of employment, has a downside to it, such as the lack of job security and employee benefits.[278]

Under the Fourth Industrial Revolution, the continuation of remote work in the labour market is highly anticipated following the recent increase in demand for remote-based work after its premature implementation during the COVID-19 pandemic.[279] With modern-day technology capable of breaking all sorts of physical and digital barriers, accommodating remote work has proven effective and will continue to be as technology progresses. This presents good news for employees who will be lucky enough to have this working arrangement as an option, as they will be enjoying benefits such as not having to commute and having more flexibility when it comes to working hours.[280] However, some occupations are unable to adopt remote work into their mode of operation. This is due to factors such as the need for physical presence or usage of specialized machinery, such as CT Scans.[281]

The Fourth Industrial Revolution will differentiate itself from previous industrial revolutions by emphasizing the importance of adopting human skills.[282] With modern-day artificial intelligence and advanced robotics, numerous other skills will border redundancy as the line that separates humans from technology is getting thinner and thinner. This creates vulnerability amongst those who perform repetitive, routine, and predictable jobs as the skills required to perform them can now be adopted or transferred to technology.[283] Thus, it is important to develop human skills, as they cannot be adopted by or transferred to technology.[284]

The Fourth Industrial Revolution is set to promote the growing trend of gig work as future employees will look to either shy away from the standard mode of employment or earn an extra income where possible.[285] The Fourth Industrial Revolution is also

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https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_732871.pdf (accessed on 23 April 2023).

278 Cherry 2020: 4.

279 World Economic Forum 2020: 16.

280 Flores 2019: 40.

281 Lund, Madgavkar, Manyika and Smith 2020: 2.

282 Adegbite and Adeosun 2021: 37.

283 Man and Man 2019: 305.

284 Butler-Adam 2018: 1.

285 Ungureanu 2019: 77.

expected to induce a shift from office-bound to remote working in some occupational industries.[286] Due to the COVID-19 pandemic, companies were forced into the early implementation of remote work to continue operating. Now that the pandemic is something of the past, companies have recognised the advantages of permanently implementing remote work as a working arrangement. However, this differs from company to company, as not every task can be performed away from the office.[287]

4.3 The *possible* impact on *future* employers

With the occurrence of each industrial revolution, employers were met with developments that they had to implement if they were to grow in business. The First Industrial Revolution (1760 - 1830) saw the rise of machines which were deployed to replace manpower, enabling employers to reduce production costs whilst increasing the production rate. This meant that employers could now produce more products with fewer hands.[288] The Second Industrial Revolution (1870 – 1914) added electricity and telecommunications to the mix, making things more beneficial for employers. With the assistance of these inventions, factories could run continuously, increasing production even more, and employers could broaden their scope of business.[289] The Third Industrial Revolution (1950 – present) introduced the internet and technology capable of digitizing data to the world of employment. Employers could now access large quantities of information and gain a great deal of clientele. Employers could also reduce the use of physical documents as data or information could now be digitized thanks to the accompanying technology.[290]

The Fourth Industrial Revolution is predicted to have an even more significant impact than its predecessors.[291] It will consist of the developments of all the previous industrial revolutions and some of its own.[292] The Fourth Industrial Revolution is set to reach heights the other industrial revolutions could not. Building on the foundation laid by the Third Industrial Revolution, the Fourth Industrial Revolution will improve the world of

286 De Ruyter, Brown and Burgess 2018: 37.
287 Ewinyu, Masikane and Webster 2021: 10 – 11.
288 Xu, David and Kim 2018: 90.
289 Kurt 2019: 591.
290 Sihlongonyane, Ndabeni and Ntuli 2020: 7.
291 Kurt 2019: 593.
292 Okoye, Ogbu and Ome 2020: 69.

employment with digitalization, automation, and artificial intelligence, combining the physical, biological, and digital realms and changing the nature of work.[293]

The Fourth Industrial Revolution will be accompanied by modern technology that will require modern intervention from employers. According to Klaus Schwab, employers can expect the following effects as a result of the Fourth Industrial Revolution: a change in customer expectations, the use of data to manage and improve products, a change in business operations, and the collaboration of companies to expand commercial activities.[294] Employers can also expect these effects to alter laws relative to business operations.

With the progression of technology, consumers have become reliant on its capabilities and have made it an essential part of their everyday life. From purchasing goods to managing and monitoring accounts, all this and more can be done in an accessible and convenient manner thanks to technology.[295] This puts pressure on employers as they have to adapt to these changes or risk having consumers take their business to a provider who can.[296]

Technology has also influenced consumers' expectations.[297] This is yet another result of the major developments made in technology over the past years. Today's consumers have access to technology that meets their every need and can perform whatever tasks are necessary. From the latest smartphones to devices connected with other devices to perform functions automatically in homes, consumers' expectations of the abilities of technology have caused a particular trend in the labour market.[298] Companies are expected to respond to these trends by adapting wherever possible and necessary to fulfil consumer expectations. In other words, companies should work on becoming consumer-centric.[299] This is crucial for a company's progression because the key to success lies in the consumer's hand.[300]

293 Nxumalo and Nxumalo 2021: 16.
294 Schwab 2016: 50.
295 Botha 2019: 188.
296 Belot 2020: 3.
297 Schwab 2016: 51.
298 Jose 2017: 265 – 267.
299 Sima, Gheorghe, Subi´c and Nancu 2020: 10.
300 Schwab 2016: 51 – 52.

With the adoption of new technology comes the need for new skills.[301] In a country such as South Africa, where the demographic of skilled individuals is not that profound, employers are faced with a major problem going into the Fourth Industrial Revolution.[302] This problem drew a lot of attention during the COVID-19 Pandemic, necessitating the need for immediate intervention going forward.[303] Employers are advised to either take measures into their own hands and upskill or reskill their current employees or choose the disfavoured option of recruiting new employees with the required skills.[304] Nothing will be more regressive to employers than having a workforce that cannot fully utilize what the Fourth Industrial Revolution is set to offer because of skills deficiency.[305]

The Fourth Industrial Revolution will require employers to revisit their approach to conducting business and how they are led.[306] Employers across the globe realize that to gain access to a larger market and broaden their business operations, they will have to join forces with other organizations and follow the latest employment trends.[307] A great example is the recent collaboration between Hewlett-Packard (HP), the software manufacturer and computer service company, and Deloitte. Their partnership is set to accelerate digital transformation by implementing 3D printing systems across the manufacturing sector.[308] Another example is the collaboration between HSBC Holdings Public Limited Company and artificial intelligence company Ayasdi. HSBC Holdings Public Limited Company sets out to deploy Ayasdi's artificial intelligence technology into their business operation to combat money laundering.[309] Not only does this present the opportunity to formulate new and advanced products, but it also opens doors for even greater innovations.[310]

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301 Sima, Gheorghe, Subi´c and Nancu 2020: 11.
302 Sutherland 2020: 234.
303 Ewinyu, Masikane and Webster 2021: 4 – 5.
304 Magwentshu, Rajagopaul, Chui and Singh 2017: 10.
305 Adegbite and Adeosun 2021: 37.
306 Botha 2019: 191.
307 Schwab 2016: 53.
308 HP Development Company "HP and Deloitte Announce Alliance to Accelerate Digital Transformation of US$12 Trillion Global Manufacturing Industry", https://press.hp.com/us/en/press-releases/2017/hp-and-deloitte-announce-alliance-to-accelerate--digital-transfo.html (accessed on 29 March 2023).
309 Irrera "HSBC partners with AI startup to combat money laundering", https://www.reuters.com/article/us-hsbc-ai-idINKBN18S4M5 (accessed on 10 April 2023).
310 Lee *et al* 2018: 4 - 5.

Employers should also take note of the emergence of the Gig Economy. The Gig Economy market has gained significant recognition over the past few years and has seen multiple employees leave full-time employment for this new flexible working arrangement. Some have even taken it up as part-time employment, attending to it after their full-time employment shift.[311] Employers are encouraged to embrace it and use the benefits it holds to their advantage.[312] For example, when dealing with short-term projects, employers could opt for gig workers instead of hiring full-time individuals, saving themselves from long-term commitments and long-term expenses.[313] This will allow employers to spend more time and resources on active employers, preparing them for the Fourth Industrial Revolution and beyond.[314] However, employers must consider a few things when planning to use gig workers. Gig workers are not full-time employees, meaning they are not bound to one employer. This gives them the authority to choose which assignments to pay more attention to. Employers should also remember that the relationship with gig workers is different from that of regular employment. Gig workers are considered independent contractors, meaning that instead of the employer being the service provider, they become the client in this relationship.[315]

It is also worth mentioning that employers must ensure that those leading the business are capable of doing so in an effective and accommodating manner. The World Economic Forum has identified types of leaders that it believes would thrive in the Fourth Industrial Revolution. This includes data-driven leaders, leaders who are good at recognizing talent and opportunity, and leaders with a high degree of human skills. It is strongly believed that these types of leaders are leaders that will benefit both the company and the labour force.[316]

Since the First Industrial Revolution, employers have come across developments that they have had to consider in order to benefit from their participation in the labour

311 Ungureanu 2019: 77 – 78.
312 De Ruyter, Brown and Burgess 2018: 42.
313 Cherry 2020: 4.
314 Ungureanu 2019: 80.
315 Di Meglio “Pros and Cons of the Gig Economy”, https://www.hrexchangenetwork.com/hr-talent-acquisition/articles/pros-and-cons-of-the-gig-economy (accessed on 31 March 2023).
316 Du Toit “Managers in the Fourth Industrial Revolution lead with humanness”, https://online.wits.ac.za/managers-in-the-fourth-industrial-revolution-lead-with-humanness/ (accessed on 12 March 2023).

market. From machines to electricity to the internet, employers had to respond to these developments to keep up with the changing labour market and to stay ahead of the competition.[317] The Fourth Industrial Revolution will expect employers to have a similar response.[318] However, this new industrial revolution is expected to disrupt the world of employment in a measure much greater than the previous three. Driven by advanced technologies, the Fourth Industrial Revolution will build its reign from the ideas of the Third Industrial Revolution and formulate its own there through.[319] Employers are urged to get to grips with the needs of the Fourth Industrial Revolution as early as possible to avoid falling behind and missing out on the fruits that will be there to enjoy.[320]

4.4 The *possible* impact on the *future* workplace

Before the 2020 pandemic, it was anticipated that the Fourth Industrial Revolution would further the idea of implementing remote work into the modus operandi of various industries across the globe.[321] However, due to the nature of the COVID-19 virus, the world of employment could not wait for the Fourth Industrial Revolution and had to implement remote work without being adequately prepared.[322] This was to ensure that businesses kept running and labour forces were protected against unemployment & the virus itself.[323] Unfortunately for some organisations, the temporary shift to remote work was a bit far-fetched and, as a result, suffered a few drawbacks.[324]

Now that the world is much safer, employees are returning to the office, with only a few still continuing the trend of working remotely. This is predicted to change as the demand for remote work has grown over the past two years, plus a vast number of companies have recognized the positive impact remote work can have as a working arrangement.[325]

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317 Belot 2020: 5.
318 Kurt 2019: 595.
319 Guan 2020: 3.
320 Guan 2020: 7.
321 Man and Man 2019: 305.
322 Amankwah-Amoah, Khan, Wood and Knight 2021: 604.
323 Economic Commission for Latin America and the Caribbean 2021: 36.
324 Mukhopadhyay and Mukhopadhyay 2020: 3.
325 Lund, Madgavkar, Manyika and Smit 2020: 2.

During its trial run, remote work provided those who participated with greater flexibility, reduced expenditures, an improved work-life balance, and a few extra minutes to spare.[326] However, it also subjected some participants to even more distractions than those usually encountered at the office, making their personal lives less personal, making them feel isolated, and increasing their workload.[327] This shows that as much as it is convenient and efficient, remote work has a few drawbacks, which raises the question: will we still see a significant shift towards remote work when the Fourth Industrial Revolution arrives?[328]

It is anticipated that the office of tomorrow will no longer be just an actual office but an environment chosen by employees where they can best perform.[329] This means that employees will have the choice of either working from the office or wherever they choose. Some might even consider adopting a hybrid working arrangement where they alternate between working in-office and remotely.[330]

Employees of tomorrow are more likely to take up employment that accommodates such flexibility than employment that does the opposite. It allows them to take more control over their work, which increases productivity, and adopt a healthy work-life balance.[331] This transition will be manageable for most, seeing that the technology at hand and that which is to accompany the Fourth Industrial Revolution will undoubtedly have no issue accommodating this change-up. For example, companies can use video conferencing software to host meetings instead of having them at the office. Also, employers and employees can access databases via cloud computing, and communication can be done via social media platforms, to name a few.[332] The arrival of the COVID-19 virus posed the perfect opportunity to test-run these developments, and it is safe to say that they fared well.[333]

The pandemic was also the ideal time to identify which occupations can effectively adopt remote work and which cannot. Occupations that usually involve information,

326 Vyas and Butakhieo 2021: 64.
327 Vyas and Butakhieo 2021: 65.
328 Ozimek “The Future of Remote Work”, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3638597 (accessed on 20 May 2023).
329 Man and Man 2019: 304.
330 World Economic Forum 2020: 18.
331 Taibah and Ho 2023: 3.
332 Amankwah-Amoah, Khan, Wood and Knight 2021: 603.
333 Ozimek “The Future of Remote Work”, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3638597 (accessed on 20 May 2023).

finance, IT, and insurance can effectively be performed remotely,[334] whilst occupations that involve teaching and coaching can also be done remotely, but they do not carry the same weight as being done in person.[335] The same can be said about legal services.[336] On the other hand, some occupations can only be performed in person, for example, jobs that require the operation of special machinery, agricultural activities, healthcare services and accommodation services, ruling out the possibility of remote work.[337]

Returning to the question of what we can expect the workplace to be like under the Fourth Industrial Revolution, we will most likely see the continuation of remote work but not the type implemented during the pandemic, but rather a hybrid version. This means that employees who can work remotely will be allowed to do so, but their presence in the office will also be required from time to time.[338]

It is no secret that the COVID-19 Pandemic hastened the implementation of remote work and its associated technologies well before its time.[339] But it did provide the world of employment with the perfect opportunity to test run, find fault, fix and perfect it so that it can be adequate for implementation in the next few years.[340]

Jobs that can be done remotely or have remote work as a working arrangement are expected to be in high demand in the forthcoming years.[341] This comes as no surprise, seeing that technology has proven its capabilities over the past two years, allowing individuals to perform work-related tasks from various locations, including their homes.[342] Therefore, organisations must keep developing and finding ways to implement remote work even after the COVID-19 period to keep up with the demands of an ever-changing labour market.[343]

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334 World Economic Forum 2020: 16.
335 Lund, Madgavkar, Manyika and Smit 2020: 3.
336 World Economic Forum 2020: 16.
337 Vyas and Butakhieo 2021: 64.
338 Yang *et al* 2021: 43.
339 Amankwah-Amoah, Khan, Wood and Knight 2021: 608.
340 Mukhopadhyay and Mukhopadhyay 2020: 4.
341 Ozimek "The Future of Remote Work", https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3638597 (accessed on 20 May 2023).
342 ELAC 2021: 36.
343 de Klerk, Joubert and Mosca 2021: 14.

4.5 Summary

Driven by high-end technology, the Fourth Industrial Revolution will expect future employees and employers to accommodate the changes it is set to bring to the world of employment. This will be through future employees equipping themselves with the relevant education and skills and employers adjusting their business approaches to meet modern standards. With reference to a passage, *"The New Industrial Revolution brings new challenges to enterprises, workers, consumers, governments, research institutions, industry organizations and the society as a whole. New industry and business models will be established and supersede conventional ones; workers will need to adapt to new job profiles and skills requirements; the integration of innovative new technologies needs to be enabled; infrastructure, standards and policies might need to be developed or adjusted to adapt to the new environment."*[344]

The following chapter will examine whether current South African laws, specifically labour laws, are protective enough over employees who are most susceptible to the anticipated impacts of the Fourth Industrial Revolution or if more should be done to further the protection afforded by these laws.

[344] Beliz, Baco and de Azevedo 2019: 2.

CHAPTER FIVE: Should current laws be adapted to better suit the Fourth Industrial Revolution developments in the workplace, or is more than the law needed to protect vulnerable employees?

5.1 Introduction

Adopting state-of-the-art technology in the workplace will necessitate implementing new and amended measures and policies that are pro-employee, considering that employees will be the ones most affected by these radical disruptions expected to be induced by this new technological wave throughout the world of employment.[345] With an estimated 5.1 million jobs across multiple countries, including South Africa, at risk of being victimized by advanced technology, plus new forms of employment taking shape, governments and their departments have to react swiftly to these changes to safeguard the labour force and their position in the world of employment.[346]

With previous chapters looking at what employees and employers should do to safeguard themselves against the impacts of the Fourth Industrial Revolution, this chapter aims to look at whether current South African laws are established enough to provide adequate labour protection to vulnerable employees during the Fourth Industrial Revolution.

5.2 To what extent are the most vulnerable employees protected by labour laws?

Under the Fourth Industrial Revolution, employees who are employed in unskilled and minimally skilled jobs are believed to be the most vulnerable or the most obvious target in terms of technological displacement.[347] These types of jobs require either no or a low degree of education and skills and are usually performed in a repetitive, routined, and predictable manner.[348] This makes it easy for the creators of technology such as artificial intelligence and robotics to program these job functions into non-human objects and eliminate the need for the human element.[349] For example, bank teller jobs have become endangered since the introduction of Auto Teller Machines

345 Ayentimi and Burgess 2019: 641.
346 Maharaj 2020: 240.
347 Kurt 2019: 595.
348 Adegbite and Adeosun 2021: 40.
349 Adegbite and Adeosun 2021: 42.

(ATMs).[350] We have also seen the recent installation of auto checkout points in retail stores across the globe, cutting out human cashiers.[351] Such displacements are expected to grow even more over time, affecting multiple employment sectors simultaneously.[352]

In the context of South Africa, this is a very worrying prospect. South Africa is a state known for its high unemployment numbers, below-par education system and citizens lacking skills ranging from basic to advanced.[353] The anticipated deployment and integration of the new industrial revolution's technology into the labour market will inevitably worsen some of these problems and possibly lead to new ones. According to data presented by the World Bank in 2020, out of South Africa's total employment, roughly 10.27% was considered vulnerable employment, which means that out of the millions in employment back in 2020, a significant percentage were labelled as vulnerable employees.[354] Two years later, this vulnerability continues to grow and will continue doing so, with more and more types of employment becoming more vulnerable due to advanced technology. This calls for urgent intervention by the government and external parties, such as the private sector, to try and find a way to neutralize this issue.[355]

The Fourth Industrial Revolution's demands will be different to those of the previous industrial revolutions, thus requiring employees to refurbish their existing skills and/or acquire new ones. In doing so, employees need to ensure that their refurbishment or acquisition of skills meets the needs of the Fourth Industrial Revolution.[356] This will place them in a position where instead of working against technology, which can be detrimental, they can work in conjunction with it. Therefore, employees should develop their skills to such an extent that they either become harmonized with technology or separate themselves from it.[357]

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350 Magwentshu, Rajagopaul, Chui and Singh 2019: 7.
351 Eberhard *et al* 2017: 61.
352 Butler-Adam 2018: 1.
353 Sutherland 2020: 234.
354 Trading Economics "South Africa - Vulnerable Employment, Total (% of Total Employment)", https://tradingeconomics.com/south-africa/vulnerable-employment-total-percent-of-total-employment-wb-data.html (accessed on 10 May 2023).
355 Ayentimi and Burgess 2019: 641 - 642.
356 Balalle and Balalle 2019: 151.
357 Ninan, Roy and Thomas 2019: 783.

However, this is easier said than done. Many employees, especially those who are socio-economically challenged, are often unable to further educate and skill themselves independently due to drawbacks that hinder the idea of doing so. This leaves them with no other alternatives but to rely on the government's or their employer's assistance.[358]

Over the years, measures have been implemented to assist employees, especially those mentioned above, in getting further educated and skilled, but these measures must be re-evaluated and new ones carried out to prepare employees for the Fourth Industrial Revolution more effectively.[359]

What is recommended is that the government actively pursue policies that promote job-related upskilling and reskilling programmes. This is to ensure that employees are made aware and adequately prepared for the implementation of new technologies into different jobs. In addition, provision should also be made for lifelong learning. This is to encourage continuous self-improvement, assist the older generations in getting to grips with the latest technology, and adequately nurture tomorrow's employees for tomorrow's jobs through all levels of education.[360] Together with the private sector, the government should also seek to increase the number of internship and learnership programmes to aid individuals in getting further knowledge, training and experience in order to excel when they become full-time employees.[361]

In support of the above recommendations, additional steps should also be taken to promote training legislation, specifically the Skills Development Act 97 of 1998.[362] Formally introduced in 1998, the Skills Development Act was promulgated to develop the knowledge and skills of the labour force, improve their quality of life, and develop their prospects of work and labour mobility. This is intended to be achieved by creating new training structures and learning programmes and developing further ideas on how to assist individuals in acquiring applicable skills and finding employment.[363]

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358 Nygren, Virolainen, Hämäläinen, and Rautopuro 2020: 196 – 197.

359 Beliz, Basco and de Azevedo 2019: 7.

360 International Labour Organisation "Work for a brighter future", https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_662410.pdf (accessed on 16 September 2023.

361 Zervoudi "Fourth Industrial Revolution: Opportunities, Challenges, and Proposed Policies", https://www.intechopen.com/chapters/70877 (accessed on 28 August 2021).

362 Skills Development Act 97 of 1998.

363 Section 2(1)(a)-(h) of the Skills Development Act, 1997.

Institutional bodies, such as the Sectoral Education and Training Authorities (SETA), have been formulated under the Act to further these objectives by identifying the in-demand skills of different sectors and providing training on these skills. This ensures that individuals are aligned with the demands of the labour market as it continues to change.[364]

The Fourth Industrial Revolution will compel employees, employers and the government to adopt measures that will neutralize the increase of vulnerability amongst employees set to be caused by the invasion of technology in the world of employment. The array of technology accompanied by this new industrial revolution will be a threat to employees who are minimally educated and lowly skilled.[365] This is primarily because these employees are usually associated with employment that fits the profile, in other words, employment that does not require a lot to be performed. And because such employment is not deemed complex, technology such as artificial intelligence and automation can indeed be deployed therein.[366] It is, therefore, crucial for employees to improve themselves educationally and skilfully so that they can end up being in demand rather than redundant.[367] However, for this to be possible, assistance from both the government and the private sector will be vital because most employees cannot accomplish the said independently due to financial constraints and social circumstances hindering further learning and development.[368] This includes but is not limited to investing more in upskilling and reskilling programmes and encouraging participation in lifelong learning so that these vulnerable employees can find a way to avoid any possible further technological displacement.[369]

Other than employees performing jobs requiring little to no skills and done in a routine, repetitive and predictable manner, individuals conducting work as independent contractors are also considered vulnerable going into the Fourth Industrial Revolution. Unlike employees in the formal sector, informal employees, such as independent contractors, are afforded little to no labour protection and benefits, leaving them more

364 Section 2(2)(a) of the Skills Development Act 97 of 1998.
365 Xu, David and Kim 2018 2018: 93.
366 Dhanpat *et al* 2020: 2.
367 Magwentshu, Rajagopaul, Chui and Singh 2019: 6.
368 Xu, David and Kim 2018 : 92.
369 Fox and Signe 2021: 31 - 32.

susceptible to the Fourth Industrial Revolution's disruptions than employees in the formal sector.[370]

Over the past couple of years, technology has remarkably influenced the nature of work by opening doors to opportunities and possibilities outside the traditional working arrangements we have become accustomed to.[371] Individuals have started to desert the idea of long-term employment for temporary or contractual positions that offer more flexibility, freedom, and possibly higher earnings.[372] Organisations have adopted the same approach by shying away from hiring full-time. Now, instead of formally employing an individual to, for example, complete a task that comes up on an ad hoc basis or task(s) that come up regularly but not enough to appoint someone full-time, organisations can source individuals from online labour platforms to attend to those tasks.[373] Not only does this shorten the hiring process, but it also allows organisations to pay no heed to a few labour obligations, which will be identified shortly.[374]

In the aftermath of the coronavirus pandemic, millions of South Africans employed in the formal sector lost their jobs due to the slump experienced in the global economy. This led to individuals taking recourse in informal employment by working as independent contractors to avoid being left entirely unemployed.[375] Despite the instability and shortage of labour protection it offers, working as an independent contractor has grown ever since and will continue to grow as the participation pool enlarges.[376]

Those working as independent contractors, especially in the gig economy, are not regarded as employees under South African labour legislation.[377] This ultimately means that the array of labour protection made available by South African labour legislation does not extend to independent contractors due to their position in the world of employment.[378]

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370 Maharaj 2020: 239.
371 Mokofe 2020: 169.
372 Ungureanu 2019: 77.
373 Kavese, Mbali and Anyikwa 2022: 6.
374 Smit and Stopforth 2023: 154 – 155.
375 Kavese, Mbali and Anyikwa 2022: 10.
376 Etim and Daramola 2020: 2.
377 Mokofe 2020: 170.
378 Fourie 2008: 118.

For starters, the Labour Relations Act[379], which is known to protect employees against unfair labour practices and dismissals, only extends its protection to employees that fall within the definition of an employee, as cited by section 213 of the Act[380], and employees that fulfil any of the defining criteria set by section 200A of the Act[381]. Unfortunately, independent contractors do not adhere to the standards of these sections, thus being excluded from any protection afforded by the Labour Relations Act.[382]

In the case of *South African Broadcasting Corporation (SABC) v McKenzie*[383], the respondent, McKenzie, instituted an action of unfair labour practice against the appellant, SABC. When the appellant terminated the respondent's services, the respondent, being under the impression that he was an employee of the appellant, perceived his service termination to be that amounting to unfair labour practice. The appellant argued this point by stating that the respondent was not hired as an employee but rather as an independent contractor. The Labour Appeal Court considered the facts and measured them against the definition of an employee, as worded by the Act, and by referring to the following characteristics as a guide to differentiate between an employee versus an independent contractor:

- *the object of the contract of service is the rendering of personal services by the employee to the employer. The services are the object of the contract. The object of the contract of work is the performance of a certain specified work for the production of a certain specified result;*

- *according to a contract of service the employee will typically be at the beck and call of the employer to render his personal services at the behest of the*

379 66 of 1995.

380 "(a) any person, excluding an independent contractor, who works for another person or the State and who receives, or is entitled to receive, any remuneration; and (b) in any manner assists in carrying on or conducting the business of an employer". Labour Relations Act, 1995.

381 "(a) the manner in which the person works is subject to the control or direction of another person, organisation, or company; (b) the person's hours of work are subject to the control or direction of another person, organisation, or company; (c) the person forms part of the organisation or company; (d) the person has worked for the other person, organisation, or company for an average of at least 40 hours per month for the last three months; (e) the person is economically dependent on the other person, organisation, or company for whom they render services; (f) the person is provided with tools of trade or work equipment by the other person, organisation, or company; (g) the person only works for or renders services to one person, organisation, or company". Labour Relations Act, 1995.

382 Mokofe 2020: 170.

383 (CA8/98) [1998] ZALAC 13 (15 October 1998).

employer. The independent contractor, by way of contrast, is not obliged to perform the work himself or to produce the result himself, unless otherwise agreed upon. He may avail himself of the labour of others as assistants or employees to perform the work or to assist him in the performance of work;

- *services to be rendered in terms of a contract of service are at the disposal of the employer who may in his own discretion subject of course to questions of repudiation decide whether or not he wants to have them rendered. The independent contractor is bound to perform a certain specified work or produce a certain specified result within a time fixed by the contract of work or within a reasonable time where no time has been specified;*

- *the employee is subordinate to the will of the employer. He is obliged to obey the lawful commands, orders or instructions of the employer who has the right of supervising and controlling him by prescribing to him what work he has to do as well as the manner in which it has to be done. The independent contractor, however, is notionally on a footing of equality with the employer. He is bound to produce in terms of his contract of work, not by the orders of the employer. He is not under the supervision or control of the employer. Nor is he under any obligation to obey any orders of the employer in regard to the manner in which the work is to be performed. The independent contractor is his own master;*

- *a contract of service is terminated by death of the employee whereas the death of the parties to a contract of work does not necessarily terminate it;*

- *a contract of service terminates on expiration of the period of service entered into while a contract of work terminates on completion of the specified work on production of the specified result".*[384]

With the guidance of the latter, the Labour Appeal Court could conclude that the respondent was, in fact, an independent contractor. This ruled out the action of unfair labour practice being instituted.[385] A few years later, the Labour Court had to adjudicate on a similar matter in the form of *South African Broadcasting Corporation*

384 *South African Broadcasting Corporation v McKenzie* (CA8/98) [1998] ZALAC 13 (15 October 1998): par. 9.

385 *South African Broadcasting Corporation v McKenzie* (CA8/98) [1998] ZALAC 13 (15 October 1998).

SOC Ltd v Padayachi and others[386]. The arbitrator deemed Ms. Padayachi an employee of SABC, which automatically constituted her dismissal as unfair. The matter was brought before the court for review, in which the same principles used in the *McKenzie* case were referred to. The court concluded that the arbitrator was wrong and that Ms. Padayachi was an independent contractor, not an employee. The dismissal of Ms. Padayachi was, therefore, not unfair.[387]

Similarly to the Labour Relations Act, the Basic Conditions of Employment Act[388] also determines its application of protection on the basis of employee versus independent contractor.[389] Section 83A of the Act [390] is generally read in conjunction with section 200A of the Labour Relations Act, as both share the same factors in distinguishing between an employee and an independent contractor.[391]

If an individual is found to be an independent contractor and not an employee, the Basic Conditions of Employment Act withholds its protection from that individual.[392] This includes regulating working hours, overtime work and providing benefits such as paid sick leave, annual leave, family responsibility leave and severance pay.[393]

In addition, organisations that make use of independent contractors are not obligated to register those independent contractors for unemployment insurance benefits, as they are excluded from the application of the Unemployment Insurance Act.[394] The

386 (D510/15) [2017] ZALCD 22 (31 October 2017).

387 *South African Broadcasting Corporation SOC Ltd v Padayachi* and others (D510/15) [2017] ZALCD 22 (31 October 2017).

388 75 of 1997.

389 Maharaj 2020: 245 – 246.

390 "A person who works for, or renders services to, another person is presumed, until the contrary is proved, to be an employee, regardless of the form of the contract, if any one or more of the following factors is present: (a) The manner in which the person works is subject to the control or direction of another person; (b) the person's hours of work are subject to the control or direction of another person; (c) in the case of a person who works for an organisation, the person is a part of that organisation; (d) the person has worked for that other person for an average of at least 40 hours per month over the last three months; (e) the person is economically dependent on the other person for whom that person works or renders services; (f) the person is provided with tools of trade or work equipment by the other person; or (g) the person only works for or renders services to one person". Basic Conditions of Employment Act 75 of 1997.

391 Fourie 2008: 120.

392 Goldman 2003: 31.

393 Fox and Signe 2021: 7.

394 63 of 2001.

same applies to the protection afforded by the Compensation for Occupational Injuries and Diseases Act.[395]

On the plus side, independent contractors are included under the protection of the National Minimum Wage Act.[396] This means that if independent contractors are to be paid per hour worked, organisations can not refrain from paying the amount prescribed by the Act, which currently sits at R25.42c per hour.[397] However, organisations often opt to pay per task or assignment, which is sometimes less than having to pay per hour spent working.[398]

Those currently participating in informal working arrangements, especially independent contractors, are left in a spot where the only labour protection they can rely on is that which is granted to them in the contract of service.[399] This gives organisations the upper hand in deciding the conditions of work, which could end up exploitative.[400] Thus, the need for policies and/or regulations to protect these workers and improve their working conditions is of significant importance.[401]

The most evident issue that should be examined is the disqualification of informal employees, such as independent contractors, from labour protection and benefits due to their position in the world of employment. It is proposed that the government promote policies and/or regulations that will provide informal workers with at least the minimum labour protection and benefits to which formal employees are entitled.[402] For instance, protection against unfair labour practices, entitlement to unemployment insurance benefits and coverage against any possible work-related injuries, to name a few. Not only will this combat exploitation, but it will also give these groups of workers the recognition they need, and it will minimize their vulnerability in the world of employment.[403]

Going into the Fourth Industrial Revolution, working outside the formal sector creates a higher risk of being subjected to vulnerability than working inside. This is because

395 130 of 1993.
396 9 of 2018.
397 GK 692 Government Gazette 2023:4(48094)
398 Kavese, Mbali and Anyikwa 2022: 18.
399 Maharaj 2020: 246.
400 Min *et al* 2019: 402.
401 Maharaj 2020: 247.
402 Mokofe 2020: 177.
403 Min *et al* 2019: 405.

South Africa's labour legislation fails to be a safe haven for those considered to be informal workers in that it deprives them of necessary labour protection and benefits.[404] Progressively, this will grow to be a big concern that will necessitate proactive intervention from the government due to new employment trends that are causing individuals to move away from formal employment in exchange for informal working arrangements.[405]

5.3 Current legal instruments and the Fourth Industrial Revolution

Apart from employees and employers having to adapt to accommodate the changes expected by the Fourth Industrial Revolution, South African legislation, especially labour-related, must also undergo adaptation to uphold the protection of the labour force against these anticipated changes.[406]

5.3.1 The Constitution of the Republic of South Africa 1996

Under the Constitution, several provisions have been promulgated that played an essential role in the formation of South African labour legislation. Amongst these provisions, the most commonly referred to as far as employment is concerned is section 23(1), which reads: "Everyone has the right to fair labour practices".[407] The right to fair labour practice has a broad statutory interpretation and is very flexible in that it continuously has to develop to ensure the protection of employees and employers as conditions change.

The Fourth Industrial Revolution will require the government to zero in on section 23(1) of the Constitution and its objectives to ensure they continue to be promoted amid significant job displacement and technological invasion.[408] Additional attention should also be given to other sections of the Bill of Rights, as the Fourth Industrial Revolution could infringe on some of these rights, such as the right to privacy.

5.3.2 Labour Relations Act 66 of 1995

404 Maharaj 2020: 247.
405 Kavese, Mbali and Anyikwa 2022: 23.
406 Nxumalo and Nxumalo 2021: 20 – 23.
407 The Constitution of the Republic of South Africa, 1996.
408 Adams *et al* 2021: 18.

One of the main objectives behind the Fourth Industrial Revolution is to minimize production costs and maximize profits. Adopting technology such as artificial intelligence and robotics, which contribute towards workplace automation, presents the realization of this objective.[409] However, the main question is what impact can be expected from such an adoption.

The capabilities of technology have advanced to such an extent over the years that, in some instances, it can perform tasks similar to that of humans and at an equal rate. This raises a few concerns as the need for human presence starts to become questionable.[410]

If automation is to increase, which unfortunately is highly likely, the labour force can expect an increase in dismissals based on operational requirements and retrenchments. Employers will look to remain competitive in the labour market and try to minimize production costs as much as possible, which will result in the adoption of automation, especially in jobs capable of being executed by technology.[411]

The Labour Relations Act will have to be applied to such an extent that, although everything around us has become digital, humans still do have a place within the labour market, and fair labour practice is still achievable no matter the situation. If this is not done, the labour market could end up being dominated by technology.[412]

5.3.3 Basic Conditions of Employment Act 75 of 1997

The Basic Conditions of Employment Act, which ensures that conditions around employment supports section 23 of the Constitution and obligations stemming from the International Labour Organisation, will require ample attention during the Fourth Industrial Revolution.

The deployment of advanced technology, such as artificial intelligence and robots, into the workplace will create concerns about specific conditions, such as work hours.[413] The capabilities of these technologies have developed to such an extent that they are

409 Mbandlwa 2019: 7.
410 Alexander 2022: 32.
411 Mbasa 2020: 329.
412 Nxumalo and Nxumalo 2021: 23.
413 Min, Kim, Lee, Jang, Kim and Song 2019: 404.

able to match and exceed human efforts while being subject to fewer constraints.[414] The threat this can pose is that employers who possess these technologies will look to find ways to sway specific employment conditions in their favour. For example, reducing working hours and manipulating employment costs to save them a few pennies.[415]

Another way in which employers will look to turn things in their favour is through employing independent contractors. As mentioned earlier, an independent contractor is disqualified from various labour protections, including the Basic Conditions of Employment Act.[416] This opens the gate for possible exploitation from employers and increases the vulnerability of these workers.[417]

The Basic Conditions of Employment Act is one of the legislations that will require the most attention during the period of the new industrial revolution. With employees being central to possible impacts, their conditions of work will possibly suffer the same fate. Employers will look to cut production costs by reducing employees' working hours and possibly overtime work. We could also have a situation where employers recruit independent contractors simply to avoid complying with employer obligations, such as contributing towards unemployment insurance. It is, therefore, the responsibility of the government to ensure that employees, including independent contractors, are not disadvantaged by conditions that are not human-centred nor promote fair labour practice.[418]

5.3.4 Employment Equity Act 55 of 1998

Post-1994, the Employment Equity Act[419] was promulgated to rectify the injustice suffered in employment caused by racial segregation. It sets out to achieve this by promoting equal opportunity and fair treatment in employment by eradicating unfair discrimination and advancing members from designated groups through affirmative action measures.[420]

414 Sorooshian and Panigrahi 2019: 910.
415 Kurt 2019: 597.
416 Smit and Stopforth 2023: 157.
417 Smit and Stopforth 2023: 155.
418 Nxumalo and Nxumalo 2021: 23.
419 55 of 1998.
420 Section 2 of the Employment Equity Act, 1998.

The Fourth Industrial Revolution is anticipated to contribute towards even greater inequality in the labour market.[421] With severe job displacement on the cards due to advanced technology, an imbalance between humans and technology in the labour market is highly probable as employers will look to capitalize on the capabilities and benefits thereof.[422]

The Employment Equity Act will be crucial in ensuring equal opportunity and fairness during the Fourth Industrial Revolution. Technology is predicted to replace multiple employees in the labour market, causing an imbalance in the world of employment.[423] The Act's objective should, therefore, be to ensure that despite the invasion, humans will still be on the receiving end of equal opportunity in the labour market and that they will not be subject to discrimination that will be to their disadvantage.[424]

5.3.5 Skills Development Act 97 of 1998

As previously mentioned, the Skills Development Act plays a pivotal role in developing workplace skills and improving employee's work life.[425] Under the Act, several institutions, such as Sector Education and Training Authorities, better known as SETAs, have been established to help fulfil the objectives of the Act. The Act also promotes internships and learnerships to encourage its vision.[426] However, despite these measures, the fight against skills deficiency and mismatch still fails to bear fruit.[427]

The South African government has adopted this shortcoming into its National Development Plan[428] and National Youth Policy[429] to emphasize the urgency of attending to this skills issue. Thus far, the National Development Plan has not met its

421 Bikse, Grinevica, Rivza and Rivza 2022: 7.
422 Xu, David and Kim 2018: 92 – 93.
423 Adams *et al* 2021: 14.
424 Nxumalo and Nxumalo 2021: 22 – 23.
425 Section 2(1)(a)-(h) of the Skills Development Act, 1997.
426 Karolia-Hussain and Fourie 2021: 460.
427 Sutherland 2020: 235.
428 South African Government "National Development Plan 2030: Our future - make it work", https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf (accessed on 09 October 2023).
429 Department of Women, Youth and Persons with Disabilities "National Youth Policy 2020 – 2030", https://www.gov.za/sites/default/files/gcis_document/202103/nationalyouthpolicy.pdf (accessed on 09 October 2023).

expectations[430] , and the implementation of the latest National Youth Policy has been disrupted due to the COVID-19 Pandemic.[431]

Going into the Fourth Industrial Revolution, the government will have to respond swiftly to resolve these skills issues, which, if left unattended, could increase employee vulnerability. The demands of the Fourth Industrial Revolution will differ from those of previous industrial revolutions, which means that the government cannot apply the ideas of the past in the future. Individuals will be required to possess both hard and soft skills and have the education to go with those skills. Approaches that could be helpful in meeting the demands of the Fourth Industrial Revolution include developing and implementing educational and training policies in line with those demands and ensuring continuous monitoring and evaluation of these policies to determine progress.[432]

5.3.6 Protection of Personal Information Act 04 of 2013

The enactment of the Protection of Personal Information Act[433] in 2013 saw South Africa make significant strides in its approach to regulating data privacy. However, it was not until 2020 that the Act officially came into effect.[434]

Augmenting the right to privacy under the Constitution[435], the Protection of Personal Information Act strives to protect the personal information of individuals, regulate how this information can be processed and provide redress where such information is not processed in accordance with the Act.[436]

The extent to which technology has progressed over the years has raised a few privacy concerns, especially involving personal information. The interconnected world we

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430 Sibanyoni "NDP 2030 Targets: SA's targets vs reality", https://www.sabcnews.com/sabcnews/ndp-2030-targets-sas-targets-vs-reality/ (accessed on 09 October 2023).

431 Chauke and Malatji 2022: 29.

432 Sutcliffe and Bannister "Research On The 4th Industrial Revolution: Implications For Local Government In The Context Of Skills Development", https://cdn.lgseta.co.za/resources/research_and_reports/2019%20%E2%80%93%202020%20RESEARCH%20PROJECTS/RESEARCH%20PROJECT%20-%204TH%20INDUSTRIAL%20REVOLUTION%20IN%20THE%20LOCAL%20GOVT%20SECTOR.pdf (accessed on 10 October 2023).

433 04 of 2013.

434 Sutherland 2020: 235.

435 Section 14 of the Constitution, 1996.

436 Section 2 of the Protection of Personal Information Act, 2013.

currently live in, where data is easily transmittable from one point to another, makes the chances of personal information getting into the wrong hands and being misused highly likely.[437] It is therefore important that the Protection of Personal Information Act be enforced and monitored strictly to prevent the occurrence of these offences.[438]

5.3.7 Cybercrimes Act 19 of 2020

South Africa has recently made significant strides in its regulation of cybercrimes. Previously governed by common law and the Electronic Communications and Transactions Act, the fight against cybercrimes has been strengthened through the enactment of the Cybercrimes Act 19 of 2020.[439]

Signed into operation in 2021, the Cybercrimes Act has become the primary legislation to regulate cyber activities, adding to the protection already afforded by common law and the Electronic Communications and Transactions Act. However, some of its provisions have not yet taken effect due to its newness.[440] Despite this, the Act's promulgation has been greatly welcomed, especially with the recent influx in cyber offences.[441]

5.4 Summary

Under the Fourth Industrial Revolution, employees deemed vulnerable are those performing unskilled and minimally skilled jobs, those lacking modern skills and education, and employees deprived of adequate labour protection.[442] In the South African context, this is very worrisome. Firstly, South Africa's labour market consists of many employees who are not skilled or educated enough to take up jobs that may evade technological displacement. This means that a great number of employees are confined to jobs that are highly probable to be captured by technology.[443] Secondly,

437 Schwab 2016: 90 – 93.
438 Ssekitoleko and Dhliwayo 2023: 9.
439 Mtuze 2022: 537.
440 Mtuze and Musoni 2023: 300.
441 Mtuze and Musoni 2023: 321.
442 Zervoudi "Fourth Industrial Revolution: Opportunities, Challenges, and Proposed Policies", https://www.intechopen.com/chapters/70877 (accessed on 20 November 2023).
443 International Labour Organisation "Inclusive Future of Work Republic of South Africa", https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_732871.pdf (accessed on 23 April 2023).

despite South Africa's various labour laws, the extent of the protection these laws afford still falls short of covering all participants in the labour market.[444]

All this calls for dire intervention from both the government and other stakeholders to assist in developing the education and skills of these vulnerable employees and to promote policies that could fill the gaps left by labour legislation to place these vulnerable employees in a better position.[445] Existing labour-related laws should also receive ample attention to ensure that, amid change, the future is still pro-human and all for fair labour practices.[446]

444 Maharaj 2020: 242 – 243.
445 Sutherland 2020: 234 – 235.
446 Nxumalo and Nxumalo 2021: 24 – 25.

CHAPTER SIX: Conclusion and recommendations

6.1 Conclusion

Since the 18th century, the world of employment has been met with stages of ideas that altered how work was done and how lives were lived.[447] Termed as the industrial revolution, the first thereof came into effect late in the 1700's, giving rise to steam power and mechanized production.[448] Factories started expanding, and the labour force grew as more people became part of the labour market.[449] The Second Industrial Revolution came into effect late in the 1800's. Distinguished by the implementation of electricity, further developments were made in production and industrialization during this period.[450] The labour force grew even more as various industries started taking shape.[451] The Third Industrial Revolution came into effect during the late 1960s. It gave rise to the implementation of the Internet, electronics, and information and communication technology into the labour market.[452] These technologies brought digitalization to the labour market, which impacted the growth of the labour force and the demands of employers.[453]

The first research question regarding what the different industrial revolutions entailed was thus answered in chapter two, as summarised above. This set the scene for an exploration of the (possible) impact of the Fourth Industrial Revolution on *current* employees, employers and the workplace. In an attempt to answer these questions, more detail on the Fourth Industrial Revolution was given.

I found that we are transitioning into the Fourth Industrial Revolution. Built from the foundation laid by the previous industrial revolution, the Fourth Industrial Revolution is characterised by a fusion of technologies blurring the lines between the physical, digital, and biological realms.[454] With advanced technology such as artificial

447 Sorooshian and Panigrahi 2019: 904.
448 Hendrickx 2019: 365.
449 Philbeck and Davis 2019: 19.
450 Okoye, Ogbu and Ome 2020: 68.
451 Sihlongonyane, Ndabeni and Ntuli 2020: 6.
452 Moll 2021: 14 - 15.
453 Goos 2013: 26 – 28.
454 Garvett 2020: 4.

intelligence and robotics at the forefront, how we live and work is getting a new meaning.[455]

Under the Fourth Industrial Revolution, impacts ranging from job alterations to changes in the nature of work are on the cards.[456] Employees who are minimally skilled and those performing low-skilled and routine jobs will be the most vulnerable among the labour force during this period. With the rate at which technology continues to develop, tasks that are not complex could easily be absorbed by it. This opens the door for job displacements in multiple industries.[457] Employers could also expect new working arrangements, such as remote work and platform work, to gain even more momentum going into the Fourth Industrial Revolution.[458]

This thus answered the question of the (possible) impact on *current* employees, which I addressed in chapter three. It appears that change is imminent and that current employees, employers, and the workplace will be affected by this change, which, unfortunately, will have some detrimental effects on all three departments.

The impact of the Fourth Industrial Revolution is currently not severe as we are still in the early stages, but in no time, we will start seeing its influence unfolding.[459] Current employees are already sharing the office with an array of technologies, and current employers already have to adjust to and accommodate working arrangements associated with the Fourth Industrial Revolution due to the fast track and changes in circumstances.[460]

Future employees, employers and the workplace will face even more hurdles due to the Fourth Industrial Revolution, as was dissected in chapter four of this research piece.

Therefore, future and current employees are encouraged to equip themselves with the relevant education and skills to avoid being disadvantaged by the anticipated technological invasion, as warned against by the International Labour Organisation in

455 Bikse, Grinevica, Rivza, and Rivza 2022: 1.
456 Loumpourdi 2021: 3.
457 Caetano and Charamba 2017: 28.
458 Man and Man 2019: 304.
459 Dhanpat *et al* 2020: 1.
460 Pärli 2021: 2.

their Future of Work report.[461] Future employers are also encouraged to continue adjusting their business approaches to adopt technological change and meet modern needs.[462]

Lastly, the arrival of the Fourth Industrial Revolution will also challenge the protection afforded to the labour force by South African labour laws, which brings us to the overriding question of whether current South African labour laws should be adapted to better suit the Fourth Industrial Revolution developments in the workplace, or is more than the law required to protect vulnerable employees?

South Africa has a great deal of labour-related legislation committed to covering all facets involving work and promoting section 23 of the Constitution.[463] With the Fourth Industrial Revolution considered one of the biggest challenges to the world of employment, the question of whether these laws are sufficient to absorb the impact of this new industrial revolution or if more should be done in favour of vulnerable employees draws much attention. Referring to the vulnerable employees identified throughout the paper, one will argue more in favour of more required to be done than there is enough to protect these employees. A prime example is the issue involving informal employees, such as independent contractors. Unlike your formal employees, informal employees are disqualified from most of the labour protection our laws have to offer due to their status in the labour market.[464] This means that the only protection they can rely on is that agreed upon between them and a client or stipulated in the work contract.[465] This could result in these employees being subjected to possible exploitation and/or unfair labour practices.[466] One could also argue that the measures to assist individuals in upskilling and/or reskilling have been short of their target, with the country still sitting with many individuals who are not skilled or educated enough for the Fourth Industrial Revolution.[467]

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461 International Labour Organisation “Work for a brighter future”, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_662410.pdf (accessed 27 August 2023).
462 Balalle and Balalle 2018: 151.
463 Nxumalo and Nxumalo 2021: 20 – 23.
464 Mokofe 2022: 171.
465 Min et al 2019: 405.
466 Kavese, Mbali and Anyikwa 2022: 6.
467 Ssekitoleko and Dhliwayo 2023: 5.

In a nutshell, more is required to protect vulnerable employees during the Fourth Industrial Revolution. Current labour legislation should be adjusted and closely monitored to ensure that the arrival of the Fourth Industrial Revolution does not disadvantage all those who participate in the labour market.[468] The implementation of policies relating to employee development by the private and public sectors would provide much assistance in preparing individuals for the Fourth Industrial Revolution.[469]

6.2 Recommendations

Moving on to the Fourth Industrial Revolution, a few measures must be considered to ensure that all parties to the labour market are roughly prepared for what is to come. The demands of the Fourth Industrial Revolution will be different from those of its predecessor, meaning that the demands of the past cannot be expected in the near future.[470] The Fourth Industrial Revolution will favour skills that can distinguish humans from technology or allow them to work in harmony with it. Skills opposite to that usually required for jobs facing possible technological invasion. In addition, the Fourth Industrial Revolution will also favour those with an educational background that is useful for its possibilities.[471] Employees, and those yet to become employees, must therefore take up means to upskill and/or reskill themselves in accordance with these demands.[472] An onus also rests on the public and private sectors to create opportunities that will encourage them to do so. This is achievable through creating lifelong learning programs, internships and learnerships.[473] The government is also encouraged to promote education and training that relates to the needs of the Fourth Industrial Revolution throughout all levels of education.[474] Employers are encouraged

468 Nxumalo and Nxumalo 2021: 25.
469 Sepeng 2019: 162.
470 Evsyukov 2019: 89.
471 Bikse, Grinevica, Rivza, and Rivza 2022: 2.
472 Ninan, Roy and Thomas 2019: 783.
473 Mbandlwa 2019: 7 – 8.
474 Zervoudi “Fourth Industrial Revolution: Opportunities, Challenges, and Proposed Policies”, https://www.intechopen.com/chapters/70877 (accessed on 28 August 2021).

to keep developing their business approaches in accordance with modern demands to keep up with changing circumstances.[475]

One of the drives behind the Fourth Industrial Revolution is to decrease production costs and increase profits.[476] To prevent employers from disadvantaging employees as a result, the government is strongly encouraged to promote policies and regulations that will guarantee the protection of employees and ensure that the principle of fair labour practice and human-centeredness is achieved.[477] Existing labour legislation will also have to be examined to ensure that the labour force is not left more vulnerable during this new phase.[478]

The Fourth Industrial Revolution will spark a new era of technological influence and capabilities.[479] More complex than its predecessors, the Fourth Industrial Revolution will test the fine line between humans and technology in multiple aspects.[480] The response from the world of employment will be crucial as it will determine who, between humans and technology, will have the upper hand. As quoted by Robert J. Shiller, "*You cannot wait until a house burns down to buy fire insurance on it. We cannot wait until there are massive dislocations in our society to prepare for the Fourth Industrial Revolution".*[481]

475 Sepeng 2019: 161.
476 Oosthuizen and Mayer 2019: 1.
477 International Labour Organisation "Work for a brighter future", https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_662410.pdf (accessed 27 August 2023).
478 Nxumalo and Nxumalo 2021: 19.
479 Bikse, Grinevica, Rivza and Rivza 2022: 17.
480 Kurt 2019: 593.
481 Hutt "9 quotes that sum up the Fourth Industrial Revolution", https://www.weforum.org/agenda/2016/01/9-quotes-that-sum-up-the-fourth-industrial-revolution/ (accessed on 04 November 2023).

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