

Fourth Industrial Revolution: Threat and Opportunity on Employment Relations

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Abstract: The world is walking into another improvement period when the technological innovation, physical innovation, and organic innovation have accomplished an uncommon development separately in their own fields. Simultaneously their applications are converging extraordinarily. Such developments are more likely to affect the employment relations, either positively or negatively. The purpose of this paper is to provide an understanding on how fourth industrial revolution may serve as both threat and opportunity in employment relations in South African world of work in adopting digital transformation agendas for leveraging the social and economic benefits of the digital-driven industry 4.0. This paper argues the manner in which the fourth industrial revolution will pave in threats and opportunities to the employment relations. Arguments persist that Fourth industrial revolution does not only bring change to future world of work but such change comes with significant threats and opportunities to the relationship between employment relations stakeholders, particularly in the South African context. This paper utilises an analytical approach from literature sources to contend that the acceleration of industry changes, more opportunities will be available for employment relation stakeholders along with the threats. This article concludes by arguing that fourth Industrial Revolution have more opportunities than threats only if it is well received and acknowledge by the public.

Keywords: Automation, Employment relations, Fourth Industrial revolution, Opportunity, Threats

1. Introduction

The fourth industrial revolution is inevitable in any country, sector or department. This is as a result that the existence of the fourth industrial revolution has brought with it significant social and economic opportunities and challenges which require an appropriate response and action from the governments as well as businesses (Manda & Backhouse, 2017). As stated by Schwab (2017:1) the fourth industrial revolution, also known as Industry 4.0, is "characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres".

According to Manda and Dhaou (2019:244), industry 4.0 "is set to disrupt society, business, and government through its innovations". Nevertheless, this disruption should not be seen as a negative end result, but rather be seen as opportunity as well. Thus, industry 4.0 "creates new opportunities; developing countries can leapfrog stages of development and align with developed markets by embracing the use of emerging technologies such as Artificial Intelligence (AI), big data analytics and block-chain" (Manda & Dhaou, 2019:244). The significance of the fourth industrial revolution lies in the role that technology has in the world of work.

In a developing country such as South Africa, world of work is characterized by employment relations which comprised of respective stakeholders (employers, employees and governmental agencies). Employers and employees are the primary role players, in a respective context; an ideology which binds the employment relations system together, and a body of rules created to govern these respective stakeholders at the workplace and work community (Nel, Kristen, Swanepoel, Erasmus & Poisat, 2016). Therefore, digitalisation will need these respective role players to play their parts because industry 4.0 affects them the most, it brings along threats and opportunities directed towards them.

Digitisation and automation of work frequently referred to as the fourth industrial revolution is considered to be the most important societal and economic trend in the world, one that will fundamentally change the nature of work, business and society in the coming decades (Arntz, Gregory & Zierahn, 2016). These changes might lead to the elimination of thousands of jobs and the disappearance or fundamental change of many current occupations (Postelnicu & Câlea, 2019). For example, Standard bank have cut labour (jobs) due to

introduction of technology (Busnesstech, 2020). At the same time, new occupations, new industries and fundamentally new ways of work will likely emerge (Brynjolfsson & McAfee, 2014). According to Schwab (2017), it seems clear that digitization and automation might thus be one of the most important issues to shape the future nature of career choices, career development, and career counselling. Therefore, from the above information the emerging changes coming with the fourth industrial revolution will directly impact the day to day running of organisations as well as to affect labour practices in general.

Nevertheless, it is significant to note that this revolution of technological use has been moving in stages before it could reach where is now at the point of the fourth industrial resolution. But, fourth industrial revolution is more digital and advanced. The first industrial revolution changed our lives and economy from an agricultural or rural and handicraft economy to one that is dominated by industry and machine manufacturing (Xu, David & Kim, 2018). The second industrial revolution included oil and electricity which enabled mass production. During the third industrial revolution, information technology was utilised to automate technology (Xu *et al.*, 2018). And currently, which includes the introduction of robotics, big data and artificial intelligence to alter the way we live or relate to one another, work and learn (Schneider & Weiller, 2018). The fourth industrial revolution has become a prominent and imminent technological change a major issue (Morgan, 2019).

The change brought by fourth industrial revolution does not only affect the digital world of work but all sectors (e.g. forestry, education etc.) that contributes to the economy, which will ultimately impact labour practices (Schwab, 2017; Petrillo, De Felice, Cioffi & Zomparelli, 2018). This is as a result that fourth industrial revolution presents the potential change in the way employees and employers relate to one another as well as the way they are governed. Thus, it is without doubt that the fourth industrial revolution will result in fundamental changes that will have huge impact on the relationship between employment relations stakeholders in both public and private sectors (Schwab, 2017).

Shank (2017) is of an opinion that in the labour perspectives technological wave of fourth industrial revolution scares the majority of employees in both developed and developing countries as the

threat to their employment. Furthermore, some employers believe that robots have better working ability, with minimum human error, than human labour and have the potential to do more jobs than humans (Cerika & Maksumic, 2007). Thus, fourth industrial revolution may serve as either threat or opportunity on employment relations. The purpose of this study is to provide an understanding on how fourth industrial revolution may serve as both threat and opportunity in employment relations in South African world of work in adopting digital transformation agendas for leveraging the social and economic benefits of the digital-driven industry 4.0.

2. Historical Background of 4th Industrial Revolution

According to Frey and Osborne (2013), as cited by Hirschi (2018:193), changes in economic and technological situation "over the past few centuries represent three major industrial revolutions: (a) mechanical production in the late 18th century, (b) mass industrial production in the later 19th century, and (c) personal computers and the internet in the 1960s". Currently, the world of working is facing technological changes genetics, artificial intelligence, cloud computing, nanotechnology, biotechnology and 3D printing (Schwab, 2017). Hirschi (2018:193) stated that "proponents of this view have stressed that technological progress is advancing with exponential speed and that we are at the beginning of fundamental changes and technological breakthroughs that will occur in the next few decades. Known as fourth industrial revolution, Professor Klaus Schwab who is believed to have coined the concept "fourth industrial revolution" defined the concept current and developing environment in which disruptive technologies and trends such as internet of things, robotics, virtual reality and artificial intelligence are changing the way people work and live" (Dimitrieska, Stankovska & Afremova, 2018). As such, automation and robots are more likely to take over most of the work currently done or conducted by people (Ford, 2015).

3. Industry 4.0 and Disappearance of Work

Frey and Osborne (2013) in an extensively popularized report, projected that about 47% of jobs in United States are more likely to be done and

conducted by auto-machines, leaving 47% of employees redundant. Hirschi (2018) stated that for Frey and Osborne to make such conclusion, "for 70 occupations, the authors estimated whether they were automatable or not, taking into account bottlenecks to computerization in terms of tasks that cannot be easily automated with current technology" (p.193). Frey and Osborne (2013) then took the same ideology to analyze to other occupations or professions in U.S. economy based on 2010 data from the Bureau of Labor Statistics. Their results estimated that undisputed number of employments such as service, administrative support, sales, and production are more likely to be automated in the nearer future. In early research before the fourth industrial revolution era, Venter (2003) maintained the view that improvements in technology often serves as a substitute of human labour. Other scholars such as Mendola (2008) see technology as a system that complements labour because technology makes people's lives easy. But Cerika and Masksumic (2017) argue that robots have better working ability than human labour and have the potential to do more jobs than humans with minimum human error. "As automation substitutes for labor across the entire economy, the net displacement of workers by machines might exacerbate the gap between returns to capital and returns to labor" (Schwab, 2017:3). Thus, this will serve as a threat to employment. Schwab (2017) further stated that it is also possible that the displacement of workers by technology will, in aggregate, result in a net increase in safe and rewarding jobs.

World of work consists of numerous tasks. Autor and Dorn (2013) concur that other tasks might not be easily automated. Therefore, fourth industrial revolution is unlikely to eliminate entire occupations. Arntz Gregory and Zierahn (2016) estimated the extent to which specific tasks might be automated and the degree to which individuals in an occupation perform such tasks, using data from the programme for the International Assessment of Adult Competencies. They estimated that 9% of all people in the U.S are employed in positions that hold high potential for automation, with at least 70% of performed tasks being automatable based on current technology. This will lead to high unemployment, but there is general agreement in literature that mass unemployment is unlikely to be a major problem in the next few decades (Arntz Gregory & Zierahn, 2016). Nonetheless, automation and robots instigated fear on humans taking into consideration

that they are more likely to replace human labour. In labour perspectives, the technological wave of fourth industrial revolution scares large numbers of people all over the world as the threat of losing jobs cut deep into the livelihoods of people (Shava & Hofisi, 2017).

Mokyr, Vickers and Ziebarth (2015) concur that ever since the first industrial revolution, there have been protests and publicly due to the introduction of technology which led to mass unemployment and dehumanized work. Each industrial revolution brought in some form of technological advancement and people adopted from each. Thus, it won't be a surprise when people do so in this era. Regardless of negative aspects of fourth industrial revolution, people will prevail. One reason for this is that the existence of potential job loss due to automation is very visible, people generally tend to underestimate the potential for new jobs that arise because of the availability of new occupations and industries (Mokyr, Vickers & Ziebarth, 2015). Furthermore, Hirschi (2018:194) is of an opinion that "labor markets react dynamically to technological progress, and changing demand and supply of workers with different skills determine the extent to which it is economically desirable to automate work". Regardless of how jobs will disappear over the years, more new jobs will be created (Manda & Backhouse, 2017). It is estimated that more than 65% of children starting school currently might end up working in completely new jobs that are currently unavailable when they enter world of work in 15 years from now.

4. Demand for New Skills

In a study conducted in U.S. and European world of work of technological progress shows that in recent decades there was an increasing job polarization (Goos, Manning & Salomons, 2009; Autor & Dorn, 2013). This may not come as a surprise in the South African context. According to Hirschi (2018:194), "job polarization describes the phenomenon where middle-skilled jobs are hollowed out, whereas lower-skilled service jobs and high-skilled jobs increase disproportionately". Hirschi (2018) further stated that this hollowing out came as a result of fact that many middle-skilled jobs (e.g. Secretaries, administrators, machine operators) consisting of both cognitive and manual tasks that can relatively easily be automated with recent technology because they follow precise, predictable procedures. Thus, fourth industrial revolution provides an opportunity in the

world of work, an opportunity to reskill employees in every sector. Piccarozzi, Aquilani and Gatti, (2018) stated that "new jobs" will definitely require new skillsets and new competencies. Therefore, this further supports need to provide needed skills for the employees in order to secure employment. As a result, such initiative will encourage a positive relationship between employers and employees. This is the case because the combination of skills needed to perform work in this fourth industrial revolution is becoming increasingly intricate and will require the current and future generations of workers to develop digital proficiency and lifelong learning capacities and capabilities (Piccarozzi, Aquilani & Gatti, 2018). Nonetheless, Man and Man (2019) are of the opinion that with the advent of fourth industrial revolution, employers are going to require knowledge, skills and capabilities from employees which were previously not required in the three industrial revolutions. As it is, one may argue that acquisition of new skills will benefit both employers and employees, as production will increase due to improved new skills while employees will become multi-skilled and competitive in the labour market. But those without opportunities to acquire new skills will be disadvantaged.

Davies, Fidler and Gorbis (2011) maintain interpersonal skills, insights, new and creative skills, cross-cultural competencies, computational thinking, virtual collaboration, new-media literacy cognitive and load management are skills that will guarantee employability. Frey and Osborne (2017) affirm that these skills are in contrast with the skills needed for repetitive and physical tasks, the very same tasks that have a greater possibility to be replaced by robots and machines.

In the South African context, preparing people for the future world of work is taken as a significant initiative. With that being said, there is a huge responsibility placed upon government to improve the educational system and align it with the requirement of the new industrial revolution. In the State of the Nation Address (SONA) (2020), the president of South Africa (Cyril Ramaphosa) spoke about the introduction of the three-stream curriculum model that will focus on a more vocational and technical education. He also aims to build 9 new TVET colleges. Autor and Dorn (2013) emphasise job requirements and skills profiles that are rapidly changing, yet when it comes to the traditional tools policymakers and employers have at their disposal to navigate this change there often

is a time lag of months, if not years, until updated information becomes available. However, Holler, Tsiatsis, Mulligan, Karnouskos, Avesand and Boyle (2014) attest to say that growing computing power and large amounts of data are increasingly making it possible to understand and anticipate changes in labour markets in near-real time and to re-shape education and training policies in a timelier manner to help narrow the widening skills gap. For example, Frey and Osborne (2013) argue to say that hundreds of millions of workers across the globe have added their professional information including their education, skills, past and present jobs to online talent platforms such as Linked-In. Affording these providers with unique insights into changing skills supply.

5. Advent of Mass Production

Chui (2017) reported that due to artificial systems, half of all existing work activities will be automated by currently existing technologies, thereby enabling companies to save billions of dollars with mass production and to create new types of jobs (cited by Xu *et al.*, 2018). As a result, firms and companies are more likely to view technological progress (automation) as a solution to reducing costs of production and labour while improving productivity. It goes without doubt that automation provides an opportunity for mass production. According to O'Neil and Eppel (2011), the use of automation in production processes will meet the demands of products from the targeted population at large while increasing profit. Thus, automation helps to increase the efficiency of employees, allowing them to meet deadlines and eventually results in customer's satisfaction (David, Xu & Kim, 2018). Prasad (2018) supports that workers today are more productive than they have ever been.

According to World Economic Forum (2016), automation is the fuel to productivity and this can be a success on the side of the employer, but it does not fuel job growth which is in obvious fact a concern for the employees. The main reason for every business is to maximize profit and the reduction of cost is an imperative factor to consider. Scholars believe that human labour will never compete with automation, which does not need for salary, no breaks and are not affected by sickness (Abbott & Bogenschneider, 2018; Estlund, 2018). According to World Economic Forum (2016), the National Institute of Standards predict that machine learning can improve production capacity by up to 20% and reduce raw material waste by 4%. In the South

African context, Mthenjana (2019) is of the opinion that South Africa must also move with the times and the ever-evolving world, which has embraced technology, automation, machine learning and robotics as key contributing factors to increase the productivity, reducing costs and boosting profit margins.

6. Fourth Industrial Revolution and Dismissal Based on Operational Requirements

Labour Relations Act 66 of 1995 (LRA) make provision for dismissal base on operational requirement. Operational requirements are defined in section 213 of the Labour Relations Act to be "economical, technological, structural or similar needs of the employer." Dismissals for operational requirements are classed as "no fault" dismissals, meaning that the dismissal is not due to any fault of the employee.

In South Africa, it is well known that employers utilise dismissals based on operational requirements is a disguise for what is in actual fact a dismissal based on misconduct or incapacity, the errant employee's job suddenly becomes redundant, or the poorly performing employee's job suddenly becomes redundant. Redundancy takes place when technology comes to existence to replace labour with machines (Acemoglu & Restrepo, 2018). Like in the case of fourth industrial revolution, employment conditions are about to change drastically with employees becoming redundant in a long run. Retrenchment is something that employees and employers should expect as a result of digitalization. Because retrenchment is a "no fault" dismissal and because of its human cost, LRA places full responsibility to the employer (organisations), to ensure that proper procedures take place and possible alternatives to dismissal are explored and that the employees to be dismissed are treated fairly.

The responsibility and placed by LRA on an employer when dealing with retrenchment are both procedural and substantive. According to this Act, employers are expected to consult employees or their representatives (Trade Unions). The main purpose of consultation is to allow employee's representatives to be able to assist employers in the form of a joint problem-solving exercise, to strive for consensus if that is possible. The matters on which consultation is necessary are listed in Section 189(2) of LRA (Van Voore, 2002). The main purpose for consultation is to reach consensus on the best possible solution to the

problem at hand. The employer should in all good faith keep an open mind throughout the process and seriously consider the proposals put forward. Proper consultation will include the opportunity to meet and report back to employees; the opportunity to meet with the employer; and the request, receipt and consideration of information. As it is, negotiation will serve as a significant tool to address retrenchment processes that are more likely to take place. In South Africa, companies such as Standard bank and Multichoice have started retrenching (Business live news, 2019).

7. Strikes in the Fourth Industrial Era

South Africa's current unemployment rate stands at 29 per cent (Stats SA, 2019), introduction of fourth industrial revolution will more likely increase the unemployment rate. There is a great need to create and grow employment opportunities in the fourth industrial revolution. With such a high current unemployment rate in South Africa in the fourth industrial era, strikes are more likely to mushroom and escalate taking into consideration the culture of strikes in South Africa which may affect the entire economy. Besides, Labour Relations Act gives employees' rights to strike. This may have a significant impact on the economy with respect to how strikes may be disruptive. "Understanding the potential, wider economic impacts of strike action can provide valuable insights for policy-makers, businesses, workers and trade unions to resort to strike action only as the very last resort" (Jordaan, 2016).

Trade unions uses strike to put pressure on employers to adhere to employees demands. Therefore, trade union may use strikes as strategy to fight digitalization. Between employers and employees, with respect to current employment conditions and status, employers are more likely to benefit from automation then employees taking into consideration how fourth industrial revolution will change production and cut cost.

8. Why Should South Africa Embrace Fourth Industrial Revolution?

In South Africa, a more futuristic approach should be adopted to address introduction of digital transformation and through it the greater incorporation of the country's cultural and creative economies (Frey & Osborne, 2013). If we do not adopt such

approach, as a nation, South Africa will be left behind; either we adopt or perish. Höller (2014) concurs that strategic interventions need to be made and implemented now to yield any change by the time the next decade passes. Nevertheless, factors such as socioeconomic challenges, political factors, social factors (poverty) may impact on the country's ability to embrace the potentials of the fourth industrial revolution. Therefore, this means radical structural transformation is required.

Many developed economies (e.g. U.S, Spain, Korea, etc.) that have already embraced digitalization are ahead of the curve in areas where South Africa lags (Inkson, Gunz, Ganesh & Roper, 2012), particularly in skills and educational development. The role of the creative economy, within this transformation, is the subject matter for a country remains competitive and relevant, in some regards to experiences of the creative economy actors a crystal ball for the anticipated changes in labour dynamics, work, instability, skills, productive capacity and survival (Jules, 2017). Other countries, including South Africa, have wrestled with the tricky question of where to locate policy development for 'creativity' within their government structures (Lent & Brown, 2013), its economic policy, industrial policy, cultural policy, education policy, or all four? Newbiggin (2017) stated that in a time of rapid globalisation within the 4IR, many countries recognise that the combination of culture and commerce that the creative industries represent is a powerful way of providing a distinctive image of a country or a city, helping it to stand out from its competitor's design.

9. Conclusion and Recommendations

The 4th industrial revolution requires developing countries like South Africa to rise to the challenges brought by their socio-historic, socio-economic and economic contexts. Developing countries need to develop strategies that are responsive and relevant to their context instead of blindly adopting so-called Westernised strategies that have worked in contexts that are different to the developing country adopting them. This would be possible only if there is good leadership (business & political) as well as policies to embrace digitalization. Osborne (2013) highlight that the success of the 4th industrial revolution will depend on leadership from all sectors working together to leverage the opportunities and address the challenges of the 4th industrial revolution. Political leadership, for example, is responsible

for developing and implementing an enabling environment for digital transformation and innovation (Autor & Dorn, 2013). Business leadership is responsible for leading think tanks and the much-needed innovation in the 4th industrial revolution, hence social leadership also play an important role in preparing society for the changes brought by the 4th industrial revolution (Barley, 2017). Political leadership in South Africa has recognized the 4th industrial revolution and its potential to address the country's triple challenges of poverty, unemployment, and inequality (Brynjolfsson & McAfee, 2014).

The development of policies and strategies addressing digital transformation is a sign of commitment from leadership as it includes the implementation of reforms, however, remains a challenge as witnessed by poor policy implementation (Choi & Huh, 2014). In the past five years, the South African government has developed regulative mechanisms that address some of the challenges of the 4th industrial revolution such as security and privacy, but few of these have been implemented as a law to give them legitimacy (Lent & Brown, 2013). Collaboration is critical during transformation or change, because collaboration between the various actors in the 4th industrial revolution is critical in ensuring the success of the 4th industrial revolution which will not only disrupt business but government and society.

Therefore, Cassidy (2016) emphasize that the development of policies and strategies that are responsive to the priorities of South Africa will require that government works with business and social partners in addressing some of the challenges and leveraging the opportunities brought by the 4th industrial revolution. For example, the challenges of projected job losses in unskilled job categories due to the introduction of robotics in advanced manufacturing will require that government, business, workers and labour unions collaborate in coming up with strategies to mitigate the risk of massive job losses that will further deepen unemployment, poverty and inequalities (Jee, 2017). For collaboration to happen, trusting relations and cohesion are critical. The current social, political and economic environment has created mistrust and weakened cohesion. Self-interest behaviour and corruption in the development and implementation of policy reforms have been observed in South Africa (Jules, 2017). It is significant to understand that that fourth Industrial Revolution has more opportunities than threats only if it is well received and acknowledge by the public.

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