THE EMERGENCE AND IMPACTS OF "INTERNET OF THINGS" AND MASS AUTOMATION: WILL ROBOTS TAKE ALL THE JOBS?

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Declaration

I certify that this dissertation is my own work. I have read the University regulations concerning plagiarism.

I am willing to allow Coventry Business School to use my dissertation as asample for future students.

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Table of Contents

Acknowledgement

To making the project a reality I would greatly thank all by team mates, the university lecturers and most especially my supervisors for the great support they offered. Finding data was with the help of my lecturer who I greatly salute. I also than my family members for the support and the almighty God for making all this happen.

Abstract

AI has advanced in the recent past actualized by the rise in globalization and high population growth. Mass automation resulting from advancement in the technological would has led to development of internet of things which has led to efficiency in operations. However, there has been heated debates on whether the advancements would lead to extinction of human which lead to initiation of the current report that had its main goal as assessing the emergence and impacts of "internet of things" and mass automation specifically looking at whether robots will take all the jobs?

The study made use of case study analysis to achieve this objective where sampling was multistage and data collection using the desk review format was undertaken for about 2 weeks. The results were compiled and the major findings reported included that mass automation has an effect on the economic system especially in the criminal, automation, and transport sector. It also has an effect on employment and people at home especially due to the high efficiency. It was reported that the automated robots have an adaptive capacity which has made them more efficient. However, the study revealed that complete substitution is not possible and humans are more superior and hence could control the way robots are used to create more opportunities. Therefore it was concluded that mass automation is all good to economic development but human capacity is highly required to govern its limits.

CHAPTER 1: INTRODUCTION

1.1:Background to AI, Intelligent Things, and Robotics

First coined at the Dartmouth Conference of 1956, the term "Artificial Intelligence" (AI) has evolved since then in meaning but remained an important aspect in the development of technological inventions that have greatly changed the world and human experiences (Winograd, 2013). By definition, Artificial Intelligence refers to the intelligence demonstrated by machines in contrast to the humans and animal natural intelligence (Hutter, 2015). Artificial Intelligence research aims at studying "intelligent agents" or the devises that perceive their environments and respond by taking an action that improves its ability to achieve its objectives and goals for which it was designed (Brooks, 1986). Since the term AI was coined, it has been applied in computer science and technology to mean the ability of machines to assume the intellectualcharacteristics or functions of humans such as problem-solving and learning (Newall& Simon, 2012). As the 20th century progressed, computer science and technological developments led to the perception that AI was mainly to be achieved through computers and allied devices and technologies, including the internet technology that started in mid 1980s and early 1990s (Hutter, 2015). Since then, such other terms as Intelligent Things and Internet of Things have been incorporated in the realm to express the progressive pattern in which machAines are performing tasks by mimicking humans as autonomous or semi-autonomous entities (Arntz, Gregory, Lehmer, Matthes, &Zierahn, 2017). Specifically, the term Intelligent Things refers to the everyday objects that mimic human intelligence and incorporate autonomous technology which they use to respond to the real world conditions automatically and perform functions that could only be performed by

humans, including such objects as automatic doors that automatically detect the authorized person's face, manner of walking, or pupil size or farm robots that automatically plant, water, spray, harvest, and process products in farms based on their ability to determine the nature of the crops and so on (Berg, Buffie, &Zanna, 2016). In factories, for instance, production systems have been developed with both AI and Intelligent Things where the Internet of Things plays an important role in interconnecting robots such that the production process is largely done automatically with little human input (Poniszewska-Maranda &Kaczmarek, 2015).

1.2: Research Problem

Nevertheless, since 1960s when automation of machines began, there have been controversies and debates on the future of humans in a world where most of the work will be performed by machines that mimic humans (Freeman, 2015). In particular, it has been argued that the future will be shaped by negative impacts of AI and Intelligent Things due to such phenomena as loss of jobs due to automation of work in industries, loss of the desire to learn because machines do the work, possible halting of the systems or errors due to failures, loss of human integrity, deterioration of human health due to sedentary life where machines do all the work and others (West, 2015). Despite these arguments, AI and the Intelligent Things are playing an important role in various sectors of the society by improving how processes are carried out, accuracy and efficiency of work, and above all, the quality of human life (West, 2015; Russell &Norvig, 2016).

The intelligent things have been used by human though despite the high affiliation, most firms have resulted to their use laying off workers. A review by Duffy &Joue (2000) estimated the future of human beings and found that if care is not taken, unemployment may raise by 30% in

year 2050. However, contrary to the opinion, Russell &Norvig (2016) hypothesis of increased innovations and thus opening the economy to more work could lead to increased employment level. Similarly, Hall (2001) using the production theory argued that factors of production can be substituted for each other and each substitution element does not lead to lower efficiency. Therefore, the theory of job loss was vague.

However, there exists scanty information on the knowledge and understanding of whether mass automation of activities in the industry and homes as a result of increased innovation through AI will lead to massive loss of jobs, especially as robots continue to take the work previously done by humans. Therefore the current analysis will seek to fill this gap by evaluating+ the extent to which robots would substitute human labor.

1.3: Purpose of the Research

Based on comprehensive review of the existing literature on the current and future direction and impact of AI and mass automation, can be seen that AI and the Intelligent Things have impacted the world in major ways, but the consequences are both positive and negative. As such, the purpose of the proposed research is to conduct a detailed study of the impacts of AI and the Intelligent Things on humans and the general world, paying attention to the concept of robotics to determine whether they pose a potential danger to the society by taking all the jobs previously performed by humans for their livelihoods.

1.4: Research Aims and Objectives

Objectives of the Study

Owing to the increasing rate of technology integration into the business world, the need to understand its effect grows each day to come up with a relativemeasure thatis likely to guide the process of monitoring the various aspects involved. As such, this research study was inclined to come up with an assessment aimed at looking into the effects of artificial intelligence into businesses. Some of the keys of this study were as follows:

1.4.1 Research Aims

1. To investigate the extent to which the introduction of artificial intelligence has disrupted the various aspects of doing businesses.

1.4.2 Research Objectives

1. To analyze the various opinions of business operators on how the use of artificial intelligence has adversely affected customer relations and job employment
2. To examine some of the reasons as to why most businesses have opted to incorporate the use of artificial intelligence into their day-to-day business operations.
3. To determine whether artificial intelligence use in the business world does indeed affect large-scale business organizations to a similar extent as smaller ones.
4. To explore the trends of artificial intelligence and automation in businesses.

1.4.3: Research Questions

In achieving the purpose of the study, the proposed research will attempt to address the general question "*will robots that result from massive automation through AI and Intelligent Things eventually take all the jobs previously meant by humans and cause the social problem of*

unemployment?" To address this question, the study will answer some specific research questions using data from the field;

i. How have the AI and Intelligent Things led to mass automation in the modern society?

ii. How has the development of robotics from AI and Intelligent Things resulted affected humans at homes and industry?

iii. Will mass automation and robotics replace humans in various sectors and thus take up the jobs previous done by humans?

1.5: Project Summary and Scope

As time advances, more and more technological tools continue to be introduced each today into the business world. Since the main role of business organizations is to maximize on its profits, it is particularly essential for firms to ensure that they can come up with logical solutions aimed at meeting the needs of their respective consumers. This being the case, this study is mainly inclined towards assessing the extent at which customer relations have been disrupted through the introduction of artificial intelligence and how this will be able cause disruption in the job market. To enhance the credibility of the results obtained, the research study was able to narrow down this quest to small-scale CRM (manufacture) businesses. The purpose of doing so was because small businesses are more prone to having more improved connections with their customers as compared to larger organizations and are largely influenced by the automation and robotics.

1.6: Research Structure

This thesis comprises of five chapters. After the introduction that has been covered in this chapter, the next chapter would review the literature on the field. This chapter would present the definition, the states and the effects of robots and automation. Thus, this chapter aims at introducing various perspectives and approaches within the topic and the benefit of such to the organization. It aims to look at the process of automation and an overview of the theoretical and the conceptual framework that inspires this study. Chapter three aims at introducing the methodology used in the study as well as the design of the research. Chapter five proposes the findings and the results of the study as well as it discussions, implications and limitation of the study.

1.7: Significance of the Study

Owing to the long list of disruptions brought about by the introduction of artificial intelligence technologies into the business world, this research study to effectively assess how such technologies are likely to disrupt normal business activities. The introduction of modern technological tools has for quite some time proven to be beneficial to the vast economic market based on the reduction of economies of scale. Although this has been the case, it is also particularly important to pay attention to the fact that such technologies also bear a significant range of shortcomings that could prove to be detrimental to the economic spectrum if they are not adequately controlled. As such, it is essential to assess the role of various stakeholders towards ensuring the introduction of tools such as artificial intelligence do not adversely affect the manner in which small business interact with their customers. Relevant ways ought to be

introduced with the aim of improving the manner in which such tools could aid in improving customer relations in advance as opposed to imposing limits to the same.

CHAPTER 2: CRITICAL REVIEW OF ACADEMIC LITERATURE

2.1: General Review of Literature

Since 1960s, the progress in AI has mainly remained steadfast but equally unpredictable and sometimes erratic. In particular, the AI, as a multidisciplinary field, is not underpinned by any profound principles or theories (Smith & Anderson, 2014). Evidently, AI models and techniques such as software systems have emerged from theories in other fields such as logic, psychology, and cognitive science (Pankewitz, 2017). In addition, AI programs need very dominant hardware in terms of operation speed and memory compared to conventional software systems. Furthermore, the more recent emergence of other technologies like the Internet have also complicated and impacted the evolution of AI systems. For instance, in 1980s when robots and other automated objects were becoming common, the popular view was that each would become a stand-alone system (Smith & Anderson, 2014). With the emergence of the internet technology in the late 1980s and throughout 1990s, the progress of AI was complicated but equally impacted positively as they combined the new technology to achieve greater efficiency levels and abilities (Pankewitz, 2017). For instance, router finder applications, like those applied in the SatNav road navigation devises, were initially stand-alone systems but later combined satellite navigational technology with AI logic to improve their performance. Furthermore, the current technology used in developing driverless cars have been achieved through years of studies that combine AI deep neural networks with newer technologies such as Global Positioning System as well as systems like the advanced vision technology (Hutter, 2015). In the same manner, as the new millennium advances, such systems as Google Translate, the language translation program by

Google Inc., applies machine learning techniques and both the internet and large database technologies (Elkins, 2015).

The Internet of Things, which emerged with the emergence of the Internet technology in the 1990s, has revolutionized AI and Intelligent Things through the concept of connectivity of intelligent things such as robots that were initially designed as stand-alone entities. In general, the term Internet of Things (IoT) refers to an ecosystem of distinct computing devices with sensors connected to them using an Internet infrastructure system. Initially, the intelligent things developed through research were normally large in size and each was designed to work alone to perform a given function or solve some problem (Borland &Coelli, 2017).

At the same time, the Internet technology arose parallel to the designing of the miniaturized intelligent things. In this case, the Internet's main focus, unlike the AI things, was on communication through the devices previously developed for computing. The idea was to connect two remote computers and allow them to communicate effectively and within a short time. In this way, users could send and receive information from remote peers within a short time using their computers (Lenat, &Guha, 2011). Robots, which were initially stand-alone AI things, have been designed in such a way that they are part of a large network of intelligent things with advanced knowledge and ability to perform functions that could otherwise be performed by many experts at a time. The new system has given rise to the idea of Intelligent Things and robots- things that are connected to each other and are able to learn, share, and use knowledge in performing complex functions with little or no human input

In essence, the Intelligent Things now incorporate the idea of autonomy (Poniszewska-Maranda &Kaczmarek, 2015). Currently, many Intelligent Things have been developed and are performing thousands of our everyday functions that were previously performed by humans,

which mean that they are increasingly making life easier (Wolla, 2018). For instance, there are self-replicating solar panels that automatically repair or regenerate cover surfaces in the exteriors of buildings, and bicycle lanes that automatically change in size in response to traffic patterns (Da Xu, He, & Li, 2014). Similarly, there are cameras that automatically capture every person, object, or vehicle passing along a street or roads, doors that automatically open when the right person approaches it and refuse unauthorized people to pass (Poniszewska-Maranda &Kaczmarek, 2015). In factories, production systems have been developed with both AI and Intelligent Things where the Internet of Things plays an important role in interconnecting robots such that the production process is largely done automatically with little human input.

2.2: Theoretical Foundation

The study will be underpinned by the philosophical theory of mind and the motivational theory. The theory of mind argues that humans have an ability to articulate events and the mental state. This has been used to cognitively develop robots using the human brains (Barber, 2016). This will be a useful theory as it will help distinguish between human and robotic capacity. In addition, it will help create boundaries for robots. The motivational theory will be adopted to explain efficiency and automation of activities for increased productivity (Bryson et al., 2017).

2.3: AI (artificial intelligence) and Intelligent Things impact on modern society

AI has been researched on widely by many scholars to identify the impacts it has had on the society and the future it portrays. A lot of advancements have been done to make AI strong and more improved. Research has shown that there is a positive relation been improved AI

innovation and societal impact (Breslow et al., 2013). Since introduction of smartphones in the year 2007, there has been a rise in big data as well as increased machine learning (Barber, 2016).

Research has shown that it has influence the level of employment as it has on the level of income generation. In addition, it has been seen to affect customer's perception and attitudes. Projections estimates that by the year 2025, AI is likely to have highly advanced (Solaiman, 2017; Bryson et al., 2017). There is expected disruptions on the way economic systems operate and the way the entire world will be due to increase AI and machine learning. In the 21stCentury, a lot of children are growth with google, Siri and Alexa (Autor, 2015; Ford, 2015). As the arts of voice and face recognitions are getting much more embraced, a lot more industries are alarmingly being affected by AI leading to societal transformation. Industries including transport, criminal justice, and advertising are some of the areas expected to be highly affected.

For instance, in the transport sector, a lot of AI is taking place. Thing like Uber and Lyft are on self-driving technologies. In addition firms like the GPS navigation software acquired by Google in 2013 has been on high use of AI (pool, 2017). Recently they launched a program "CarPool" that bring all its users together and converts them to drivers so that they can commute together to work. Another example is the Waymo which is a self-driven car. In the last year it was able to reach 5 million miles on public roads. Tesla also using its autopilot techniques has been able to move people and has covered over 300 million miles (Sipser, 2005). In addition, it is moving forward to disrupting the tracking techniquescurrently employed through its autonomous vehicle referred to as "Semi". This looks attractive, though has had a big impact on the level of employment. For instance Walmart has embraced the use of Telsa AI powered trailers which has led to retrenchment of casuals (Krauss and Starkman, 2000).

Some researchers argue that the AI powered devises will have a positive effect on the society as much work will be automated. Consequently, improving productivity. The end results will be production at low cost which will lead to low price setting and thus improvedconsumer's purchasing power (Lawrence et al., 2000; Marshall et al., 2006). In addition, the automation is expected to save human time as well as reduce transportation cost by more than 50% (Bryson, 2008; Claxton, 2015; Dennett, 2017). Riding will no longer be a luxury as most people will affords to pay for the self-driven automated vehicles.

Transport will not be the only industry that will be affected. A lot more effect has been felt in the industry of criminal justice and more is expected in the future. The judicial systems have for a long time relied on finger prints which are becoming less important in the advent of facial recognition technology. Some courts have already used AI to sentence criminals. A lot of researchers have hypothesizes cases of negative societal impacts when AI technologies are adopted in the field of criminal justice (Bryson et al., 2017). More so it might infringe on democracy and thus over rule the constitutional powers. Keeping in mind that there is no sense, then it is possible to reproduced biased data that could lead to wrong decisions. For instance a study conducted on the data of black Americans revealed that their data was biased and thus use of AI would lead to wrong conclusions.

It is expected that the industry of advertising will be revolutionized by embracement of AI. A research conducted by Brynjolfsson et al. (2017) revealed that since it is possible to predict consumer'sbehavior, automation will make advertising easy, cost effective and more dramatic. Perzanowski and Schultz (2016)predicted that use of automation could be more appealing to customers and could reveal more customers character. Consequently, impacting on their

willingness to purchase. Another review by Frischmann and Selinger (2016) found that use of AI would help raise the level of advertising and improve brand awareness and mind image by 12%. Similarly, Bryson (2015) hypothesized a case of 20% increase in customer base as a result of automation and use of AI. The use of AI has helped make advertising more personalized. This has impacted to consumer'semotions and improved sales as consumers feel a sense of belonging. This art has widely been applied by Amazon.

Thanks to AI developments, advertising is going to be embedded into people's daily lives. This has an impact on humanity and their personality. Under the search results and social news feed, the advertisers have used AI to embed their adverts making them personalized (Roughgarden et al., 2006).

Research has shown that civilization has been the ultimate goal of AI. However, they have cautioned on use so as to keep it in the positive run. AI has widely been used interchangeably with robots though it encompasses the google, IBM and autonomous weapons (Mill, 1859; Price, 1972). For this reason its societal impact is quite huge. More so in its adverse cognitive ability to outsmart the human capability.

Intelligence has been seen as information transformation and thus use of AI has been seen to outweigh human by more than 10 times (Cadwalladr, 2017). High technological advancement and internet access, helped transform the ways things are done. More explicitly form human to digital form. It the past a lot of cultural and religious reactions were raised on conversation of machines to human images. The part of humans blinded the whole scenario, though research suggest that the use of AI has been taken up way back in the 80s. For instance use of expert systems for detecting fraud in smart cards and checking circuit board had been taken up in the

early 90s. Similarly machine learning algorithms had been taken up by firm's way before. Therefore the impact has slowly been changing the society and is expected to rapidly transform it in the near future. In the 90s use of probabilistic and Bayesian methods changed the way machine learning was perceived (Haines et al., 2016; Reed et al., 2016). For instance in the 2016 presidential elections of US and the federal elections of UK were highly under the influence of AI. However, it has also negative consequences like the cyber hacking models applied. In addition, AI using robotics has not only entered the social space but has also affected the physical space of human nature though weapons, vehicles, domestic devices, and drones. Research has shown that human being are increasingly getting embedded in pervasive automated perceptions.

There has been raised concerns about the societal impact of AI. Research has shown that about 60% of the most successful firms use AI (Haines et al., 2016; Reed et al., 2016). Firms like Apple, Amazon, Microsoft and Alphabet have made heavy capitalization on use of AI. There has been a witnessed revolution of how people gain knowledge, access credit and information through the use of AI in combination with adoption of ICT. In addition, others have hypotheses and given results that Ai reduces inequalities, social injustices, and extreme poverty. According to Youyou et al. (2015) agriculture has benefited from the revolution with 45% increase in crop management. A study by Bishop (2006) revealed that 45% of farmers can now access fair market prices and 46% of those that adopted this technologies can be able to predict weather more effectively.

Government regulations have had to keep up with the pace. For this reason policies on AI use have been invented. Thies et al. (2016) found out that there has been strict regulatory frameworks for use of AI. However, has been raised concerns on adoption of this technologies.

2.4: development of robotics from AI and Intelligent Things effect on humans and industry?

It is important to note that robots not only depend on computational abilities but also relay on physical capabilities. And therefore could not eliminate human completely from work. Most importantly, robots are designed for specific purposes and cannot multitasks as humans would. In addition, they must need human assistance.Berthouze (2013) argues that human self-management and utilization of AI has helped them learn and advance. Similarly, Haines et al. (2016) argues that robotic intervention only need human regulation so as to avoid disruption of the physical space. Deng et al. (2017) categorically states that there are no reasons that would make humans eliminated by robots. However, Vincent (2016) argues that there are extensions that need attention and concerns especially considering the raised intelligence on the social-technical systems.

Since inception of technologies, there has been raised concerns that technologies displace workers. However, concerns on community, household and live disruptions have not been given considerable concerns despite the existing knowledge of the positive correlation between income and purchasing power as well as the negative correlation with poverty (Haines et al., 2016). On the human space AI has had reaching advantages including reduced mortality and longer lifespan. This has been a measure of political stability. However, income inequality has been related to political polarization. This could be a future problem in cases humans are to be

retrenched and AI take over. In addition, economic trends like the global financial crises which made unemployment revels rise even much more and inflation rise, will make the situation more badly. The consequences for industries like agriculture will be lack of labor and for the industries will be existence of cheap labor. Haines et al. (2016) argued that inequality and political polarization were some of the contributing factors toward adoption of AI.

For instance, in the South Carolina, there has been much adoption of robots welding which has led to reduced number of casuals. On the part of the firm, there has been reduced cost of production andthus firms have been able to reap economies of scale (Eyben et al., 2013).

Unfortunately, it is expected that governments would use the AI systems to protect their own. However, research has shown that most government's agendas are not to support their own. For instance China made use of digital surveillance not to protect its citizens but to destroy millions of families. For this reason, most citizens have suffered their democracy especially the right to religion and speech. On addition, AI and digital economy have hurt individual data rights. This is because they have ease of exposure and high threat to cybercrimes.

Redistribution has been seen to be the most effective way of ensuring some of the challenges like income inequality and poverty are dealt with. One of the biggest importance of embracing ICT and AI has been in its vast ability for wide coverage. In addition, about 75% of youths have been absorbed into technological advances. They have been able to connect with the global economy thus advancing economies. However, attempt to have high robotic adoption may change the human thinking (Eyben et al., 2013

2.5: Mass Automation and Robotics Replace of Humans in Various Sectors

A lot of social scientist argue that AI and robots will replace humans at work. This is under the assumption that AI has rapidly increased and has by far sup pursed the capability of human. Some have even alleged that it has taken the human space and may thus lead to human extinction. Researchers have already shown that it has out smarted human in different domains including criminal justice, advertising, and transportation(Hofmann et al., 2014; Haines et al., 2016). This has been put to light by the high margins reached by firms that have embraced this techniques. For this reasons they have disrupted human lives and more so the employment side. However, there are no research results showing complete use of the machines and there has been no machine ambition (Thies et al., 2016; Deng et al., 2017).

There has been claim that lack of machine dominance has been as a result of narrow AI. However, advances are to be experienced in the future which will consequently lead to dominance.

There has been conflicting thought on terms that have been used interchangeably. This includes learning without limits and human intelligence. The learning without limits should be allowed as it leaps positive results. Human intelligence is the challenge as it leads to bias. However, positively taken, human intelligence leads to high exploration of things, accelerates the rate of activities and technologies adopted(Vincent, 2016). Existence of super intelligence in systems has led to fears of human work extinction. This has been so as the robots designed have had high capabilities beyond human examination. For instance, Reed et al. (2016) revealed that a robot playing chase will be able fight all its opponents and a filling robot would arrange all papers in the planet.

However, having said it all, AI have been built underhuman responsibility and thus humans could limit their architecture and thus regulate its operation. However, super intelligent systems are able to learn and thus increase their future potential which in this case threatens human activity (Thies et al., 2016; Deng et al., 2017). An evolution has indeed been experienced form the time humans began writing and there has been changes since then. Therefore, humans have only designed technologies without proper arguments which have led to adverse effects of climate change, global warming, and loss of biodiversity (Vincent, 2016).

Taking the case of robots, they not only rely on computations but also on physical capabilities. Vincent (2016) revealed that digital manipulation of activities such as typing and plying game is not an option for a smartphones no matter how intelligent it might be. He showed that what mattered is the design that was adopted (Youyou et al., 2015). This was under the conceptualization and understanding that robots only perform as designed. Therefore unless designed to depict a social behavior we will not see it learn to depict a scene of social behavior. He argues that successful firms that used the robots and other AI techniques, showed the improvements doe to existence of humans. He concluded that there would be no point when complete substitution will be effected.

Mass automation has had an effect on governance and accountability. For a long time AI has been used to deal with fraud, crime and money laundering. This has then helped governments and has raised morals among citizens. Research has also opened an avenue showing that AI is a path towards monitoring of potential trouble makers. A research conducted in china revealed that the government was not only using facial recognition but was also used moods to identify human capability.

It has been revealed that major problems are those of inequality and redistribution. Therefore, the major issue is not adoption of AI and ICT. Nor is it in invention of robots. Researchers have argued that solving inequality issues and ensuring redistribution is properly done would solve employment problems and the impact of AI or rather the robots would not be felt.

2.6: Definition of Terms

For the purpose of the current review, definitions given by AI text Winston (1984) will be adopted as well as used by studies in biological intelligence (Romanes, 1883; Barrows, 2000). The terms are selected for clarity and to ensure effective communication to the readers.

- Intelligence- will be taken as the ability to do the right by distinguishing it from the wrong. This entails doing it at the right time and recognizing that doing nothing will make the situation even worse. It also includes the capacity to associate and act. Researchers like McCarthy (1983) and Touretzky, (1988) identify plants and thermostats to be intelligent. In the context of the current survey we will discriminate the system to be cognitive and thus give the system the ability to change it intelligence.
- Artificial intelligence AI- will be used to describe artifacts that exceed the capability of natural intelligence. For instance speech recognition, pattern recognition and machine vision will be some of the examples of AI. Including robots in the definition, then AI will be all artifacts that out rule the capability of human beings (Hancock et al., 2007; Bandyopadhyay and Hazra, 2017).
- Machine learning (ML)- this is a mean of programing AI without using the usual human coding. It could be used to capture new action skills like in demonstrations. Noted is that ML needs human hands to do the programing and thus making human elimination impossible (Selinger and Hartzog, 2017).

- Robots – are artifacts that act in the physical world on the part of human character. It should be noted that they also act in real time. By this definition robots will not be limited in definition and will include even smartphones. This should give a grip of the kind of societal revolution the artifacts are likely to cause in a century where smartphones are the order of the day. It has the ability to transform and move information from one point including the google home, Amazon Echo (Alexa) and Microsoft Cortana (Iyengar et al., 2012; Newman et al., 2014).

CHAPTER 3: METHODOLOGY

3.0: Introduction

The chapter will look at the research design that will be employed, the population involved, study area, sampling procedure, collection, data needs, and analysis.

3.1: Conceptual Framework

Conceptual frameworks as applied in many disciplines helps in linking variables.

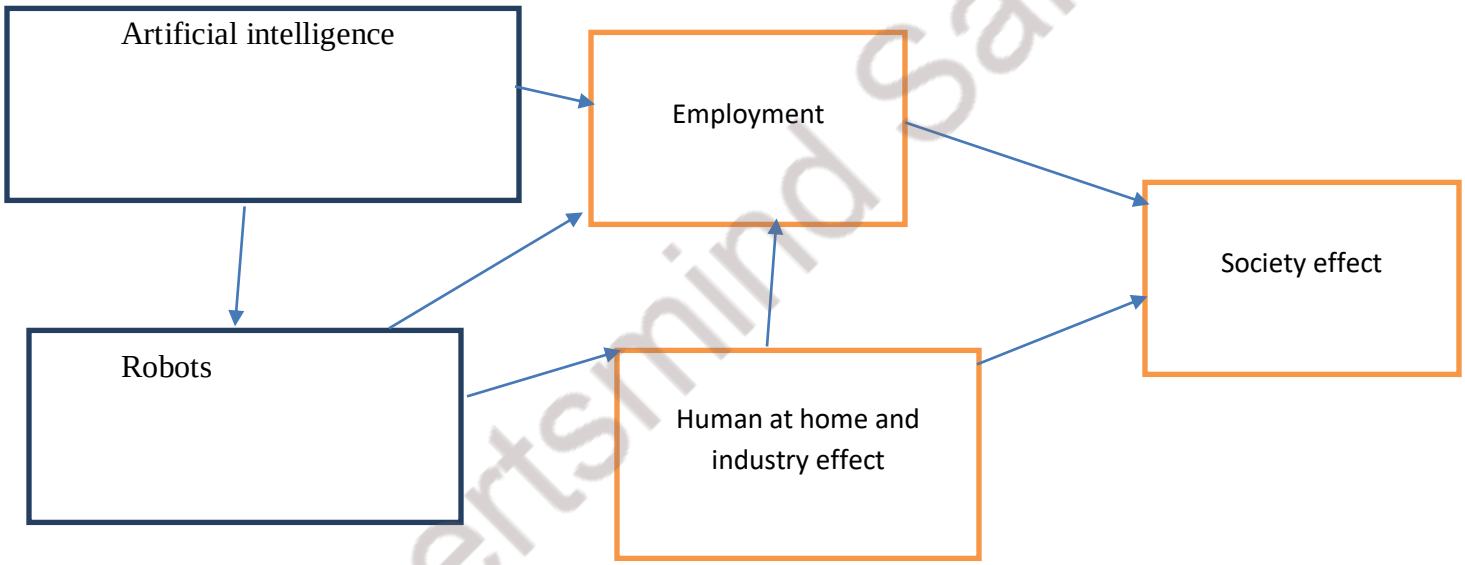

Figure 1: conceptual framework (author, 2019)

Both the dependent variable and the independent variables have been linked. From the figure above, AI has led to development of robots. Both have an effect on the level of employment hence affecting the labor market. Robots have an effect on people at home as well as the product and service industry which consequently affects the labor market. Employment and effect on people has long-term effects on the overall society.

3.2: Research Philosophy and Strategy

Research philosophies help in assessment of how data in a study should be gathered, analyzed and used. The researchmade application of quantitative research methods hence making the most applicable philosophy to be interpretative. To be able to generate to the entire population, deductive approach was adopted. The methodology applied was case studies as a mono method and thus the strategy that was most applicable was the case study analysis. The techniques and procedures that were applied included use of data collection and analysis from multiple cases covering the topic selected using a random sample method.

3.3: Study Design

This research section mainly attempts to point out some of the various methods of data collection incorporated in the research study. These include the method employed to come up with relevant data regarding the incorporation of artificial intelligence technology in the vast economic environment.

According to Grove and Burns (2009), research design can be viewed as the overall plan in conducting a study where the researcher is required to alter the various factors likely to hinder the rationality of the findings. This section, therefore, entails the procedures undertaken to collect and analyze data. Also, the main purpose of this section is to come up with relevant answers to the presented research questions. Hussey and Hussey (1997) on the other hand perceive research design as a section whose main aim is to point out what data has been collected, when, why and point out how the obtained data may be analyzed (Malik, 2018).

This section may also be perceived as a plan involving the actualization of the study objectives. This is mostly done through the answering of key questions aimed at analyzing a topic at hand. The study will hence make use of casestudy research design and will as make application of quantitative research design. The two designs were chosen for their appropriateness in addressing the objectives. Quantitative techniques especially descriptive statistics to analyses the objectives will be used and data reported. The discussion will be comparing different cases that have been done in the field where their results will be compared and discussed. The results will make a bases of review. Similar,designs have been applied by Duffy &Joue(2000). Similarly, Russell, &Norvig (2016) used the techniques to give a case of whether robots are likely to takeup human work. Also similar techniques have been used to assess the effects of AI on the society and human life.

3.4: Study Population and Sampling Procedure

As such, the researcher will use a quantitative approach in which interviews with experts and corporate leaders in key organizations (IT and computer services, hospitality, education, and finance) will be interviewed, focusing more on the economic sector in which IT is greatly playing an increased role. Data from the Programme for the International Assessment of Adult Competencies will be utilized to categorize various jobs in the service industry.Then, the research will focus on such organizations as banks, media houses, and IT developing companies where AI and Intelligent Things play a key role in the day to day running of the business.

From the data that will be retrieved from the data base, the researcher will make of a multi-stage sampling techniques to select respondents to be interviewed. First purposively, the

researcher will select 3-5 firms from different industries (IT and computer services, hospitality, education, and finance). Respondents will be selected randomly using the proportional by size technique. The sample will compose of a total of 300 respondents. Choices of persons to be interviewed in a firm will be on simple random approach.

Sampling of case studies to be used for analysis will also employ a multi-stage technique. First, a census will conducted for all studies covering the AI topic for the last 10years. This will be done bysearching from google engine. After all have been accessed, the researcher will select 20 studies for each objective randomly to compose the sample for the purpose of analysis. Therefore a total of 60 papers will be reviewed to answer to the objectives.

3.5: Data Collection Methods

The method to be used in the collection of data often varies depending on the nature of the study as well as the objectives of the study. As such, the data collection methods to be used may either be through primary data collection sources or secondary data collection. The former involves the act of gathering first-hand information from the main source whereas secondary sources involve the review of someone else's work about a specified topic. This may include the use of tools such as questionnaires or interview schedules to inquire on key information that could prove essential for the research study. Secondary data, on the other hand, involves the review of already collected data by a third party. These may be in the form of print media, online material or in the form ofaudiovisual formats. These are also essential as they too, serve the same purpose of enriching the overall research project (Schidzig, 2017).

In obtaining quantitative data, the researcher will obtain quantitative data from the participants, who will be composed of individuals working as IT experts and corporate leaders in

the selected organizations. The researcher will conduct analysis with these participants to examine their expert knowledge and understanding of the roles and future of mass automation and robotics as a result of AI and Intelligent Things. In particular, their expert opinion on the impacts of robotics on the society, especially in regards to their ability to take up jobs previously done by humans, will be an important aspect of the interviews (Drum, 2017).

The study will make use of both primary and secondary data sources. Secondary data will mainly be used to support review and available literature on the topic. This will include review of journals, textbooks and articles. Primary data will be collected from sampled industries where questionnaires and interviews will be the main methods of data collection. Questionnaires will be sent via emails and interviews will be conducted to key industry informants to be able to inform the survey. Questions addressing all the objectives will be captured in the questionnaire. The data will be collected in 2 months with the help of 20 enumerators.

The researcher will analyze the 60 articles selected as the sample for case study analysis. The desk review will be undertaken within a period of two weeks. Interlinked papers will be used to inform the objectives it cover. Therefore, the sample papers will not be restricted to the objective they have been selected for.

3.6: Variables of Research

The study will have a set of two variables- independent and dependent variables. The independent variables will define the emergence and application of AI and Intelligent Things in IT and the corporate world. On the other hand, the dependent variables will define the outcomes of the use of both AI and Intelligent Things in the corporate world, which are basically the

observed impacts that the application has on the corporates. In addition it will also compose of the effect it has had on employment and the overall labor market.

3.7: Data Analysis

Given that the proposed study will be a quantitative research, statistical approaches to the analysis of data will be employed. Specifically, the Statistical Package for Social Sciences (SPSS) will be utilized in this study. Worth noting, the SPSS tool is a data management and statistical analysis software tool with a highly versatile capability for data processing. Worth noting, the SPSS tool is an electronic storing questionnaire data in which data is stored in tables in spreadsheet format in the same manner as Ms. Excel. Furthermore, the SPSS tool generates routine descriptive data for responses to queries such as distribution of multiple-choice questions and frequency counts for closed questions. SPSS efficient in creating graphical presentations and reports while also exploring relationships between variables.

For the case of sampled case studies, the researcher will read and compile a case on the discussions and findings reported. The key issues raised will be typed in word and comparisons made to make a justified case of advancement in AI and the impact it has had on employment and the society at large.

3.8: Research Reliability and Validity

Bryson et al., (2017) alleged that research should be undertaken using valid instruments that are free from bias. The research was therefore undertaken using reliable methods and instruments and thus other researchers could rely on them to arrive at similar results. The model used has been used in past research and thus offers consistency in results.

3.9: Ethical Considerations

The research was undertaken with a lot of professionalism. Due diligence, accuracy in reporting and acknowledgement of other peoples work was core to the current analysis. In addition, paraphrasing was highly utilized to avoid cases of plagiarism.

CHAPTER 4:RESULTS AND DISCUSSION

4.1: Economic Effect of Mass Automation

On one side, the emerging Intelligent Things are improving the speed, quality, and efficiency of work processes in every aspect of life, including in industries, homes, and schools. Specifically, the incorporation of intelligent things in industries has enhanced the speed, quality, and reliability of the processes (World Economic Forum, 2015). Manufacturing of various products such as food, beverages, and household items has greatly improved and the quality and reliability of the products has also improved, thanks to the use of robots and other automated machines. In essence, it implies that these intelligent things have improved the ability of our industries to meet the needs of the every growing population (World Economic Forum, 2015). Similarly, in agriculture, production of food and industrial raw materials has improved with the emergence of automated machines that aid in various areas of the sector, which implies that the ability of the agricultural sector to meet the ever-growing demands is enhanced (World Economic Forum, 2015).

Nevertheless, there are various aspects of the Intelligent Things that have caused detrimental effects on humans and the industry. In particular, the loss of jobs has been a common phenomenon that has come along with the emergence and application of automated things in various areas of the economy and life (Ray, 2016). For instance, when banks adopted the use of the Automated Teller Machines in the 1990s, many job opportunities for cashiers and tellers were lost, which means that so far, millions of jobs have been lost (Darlington, 2010).

Artificial intelligence can be defined as the incorporation of technological tools to perform various tasks that are conventionally meant to be done by human beings. This can also be viewedas the replacement of human intelligence with robotic techniques in solving some of the various problems available in the world today. As time advances, new technological advancescontinues to be introduced in an attempt to enhance the functionality of the various sectors of the society. A good example of such instances includes the introduction of the human-made intelligence in the working world in the current century. The 21st century is with no doubt one of the most revolutionary centuries to date where scientists have been tasked with the challenge of coming up with solutions to some of the key issues thatare currently barring the human species to achieve everything in their desire(Malik, 2018). To do this, different elements such as software, algorithms, and computers have been selected to take charge in offering the simplification of some of the activities that were otherwise close to impossible to achieve. This has led to the common belief among people that the sole existence such technological tools have made the human population more reluctant as far as solving problems manually is concerned. This has therefore made most people believe that the absence of such tools could somewhat make life a little bit difficult than it is.

Traditionally, people were used to the use of manual intelligence in solving some of the challenging phenomena known to man to this very day. Although this was something that made most individuals seem outstanding, it is particularly important to point out the fact that relatively similar problems can be comfortably solved by the click of a button. This goes to show how much the world has experienced a substantial revolution over time which has led to the incorporation of artificial technology to replace roles that are normally carried out by individuals. To this very day, great debates continue to emanate from different corners of the world about the

introduction of artificial intelligence in solving lifelong problems that could otherwise be solved by an individual. As such, different schools of thought exist about whether it is a positive move or a mere act of experimentation that could arguably lead to substantial problems in the long run. In simple terms, different people argue for and against the inclusion of artificial intelligence in the human world with some fearing that this could be the beginning of the end to normalcy. Others believe that this could be the solution for problems that have faced the human population for centuries(Dirican, 2016). Regardless of the answer invoked by either party, it is particularly important to acknowledge the fact that modern systems have already integrated the use of artificial intelligence and hence this ought to be considered as a normal lifestyle for people in the years to come. Regardless of the fact that the inclusion of such technological tools may bear benefits as well as shortcomings to the different sectors of development (economic, social, and political sectors), it is essential to point out that different research studies continue to be conducted in an attempt to monitor and control the rate at which such tools are likely to influence the aspect of human life.

Robots and Automation in the Economic Sector

As discussed earlier, robots and automation bears significant impacts on different sectors of development. One of the main sectors which have been heavily influenced by the introduction of this technology is the economic sector. Since the era of industrial revolutions, countries around the world persistently attempt to come up with various ways in which they may be able to propel their respective economic development. As such, scientists have been working tirelessly to ease the various tasks involved in the running of a country's economy. Owing to the introduction of modern tools that enhance efficiency in conducting business, most people today are more likely

to attest that they may not be able to survive without the help of such tools. Although this is the case, it is also essential to point out the fact that the sole existence of such advancements does not necessarily have to discredit the efforts of manual labor. This can be proven through the fact that there exist some operations that are unlikely to succeed without the sole intervention of the human force. As such, the introduction of artificial intelligence in the overall economic sector does indeed bear both disruptions as well as benefits in general. The two, therefore, depends on the scenario at hand(Ashrafian, 2015).

Judging from the analysis of the economic conditions in the past all the way of what is currently being experienced around the world, it is easy for one to questions about what the future holds as far as the incorporation of technology in the business world is concerned. This, therefore, means that there is a higher chance that the future does indeed hold a great lot of expectations as more and more advancements continue to be introduced each day. As people ask questions about what the future holds about these factors, it is also essential to ask what it is likely to take to ensure that this goal is achieved. Based on the current progressions, it is obvious that scientists are more inclined towards coming up with tools that are aimed at reducing human effort with regards to taking part in distinguished economic operations hence creating room for the intervention of human science. This could be a clear indication of how the future is more likely to be characterized by a state where people spend less time in attempting to earn a living through manual labor. As such, fewer people will be actively involved in the growth of not only the local or national but also regional economies hence making it widely acceptable to a global audience(Dirican, 2016)

With the ongoing economic trends, it is quite logical for one to have endless questions about the fate of the current human population in the vast economic sector. Over the years, people have often been struggling with the problem of unemployment owing to the ever-flooded employment field making it difficult for a significant margin of people to lack logical means of earning a living. Ironically, the same scenario is more likely to face people in the future even though the economy will most likely be composed of limited human interactions. Although this has already begun being the case in some parts of the world, questions still linger on whether cases of social distortions, mass poverty and unemployment are likely to be prevalent in the future. If the current trends continue to grow in the same direction, the chances are high that the new world will indeed be filled with intelligent systems, robots, and algorisms being in the frontline of controlling not only the welfare of theeconomy but also growth in other sectors. this, therefore, all the need of ensuring that relevant stakeholders actively play a role in ensuring that appropriate measures are, put in place toregulate therate at which such influence is experienced(Paolucci, 2016).

Although a lot is still unclear on what the future is likely to be with the integration of modern technological advancements n economy, research projects less involvement of the human population in an attemptto impact the world economically. As per today, the introduction of artificial intelligence has already led to the replacement of the labor force in different corners across the world which is likely to experience growth as timeadvances hence making it quite unclear as towhat the fate of the current labor force stands. This menace has been experienced not only in the industrial sector but also in the service sector which was traditionally considered to be driven by human intervention. This only goes to confirm that enormous economic changes are likely to occur in the remuneration models, working time, the profile of various job

specifications, overall working relationships among different stakeholders, as well as the economic structure used(Paolucci, 2016).

Some of the other parties also experiencing the problems associated with the incorporation of artificial intelligence in the economic sector include legislators, educations systems, employees and business firms. The fate of these specific parties lies on unforeseen inventions which in a matter of time could either prove to beneficial to them or pose further challenges to them. One of the parties that continues to face immense criticism includes the legislators. More and more people continue to voice their opinions on why they believe new legal frameworks should be introducedto cope with the ever-growing demands posed by new technology. Logically, the welfare of the public should be taken into consideration upon the introduction of technological enhancements that bear a direct influence on their economic wellbeing. As such, legislators ought to come up with relevant ways aimed at ensuring that each is capable of playing a significant role in the enhancement of the world's economy(Fagundes, 2018).

Since the introduction of artificial intelligence bears significant influence on information technology, intellectual property, employment laws, labor and economic competition, and product liability, this research study is inclined on highlighting on how this change has disrupted the modern society. This also includes the consideration of issues related to the protection of private data and the replacement of human labor in the economic system.

Key Robotics and Automation Fields

To date, artificial intelligence technology has actively been used in different economic fields with the sole purpose of enhancing its overall development. There are five most common categories in which automation has been a common occurrence. These include:

Deep learning- this involves a scenario where a machine is equipped with relevant algorithms to enable it to conduct abstractions (often high-level) in a given set of data. To achieve optimum results, it is essential to ensure that all the machines have been interconnected. This is particularly essential as it allows specific computers to avoid potential mistakes that would have otherwise been caused by a single machine allowing them to avoid such problems in the future. This trend is left to run for a longperiod which allows computers to distinguish the dynamics involved hence making them more efficient as compared to human beings. This makes them more intelligent as compared to human experts(Wynn, 2016).

Dematerialization

The introduction of modern technological tools has allowed business owners to find an easier time where they can effectively record and process relevant data accordingly. This was mainly introducedto do away with the traditional office paperwork. The use of computer systems allows for effective use of an autonomous system where relevant information is categorized and sent to specific employees based on their demands. Dematerialization is slowly becoming more integrated into the modern economic world to ensure that there are fewer materials use in the production of various economic products. A good example of such instances includes the introduction of online streaming services whichare mostly aimed at outdoing with the use of

DVDs and CDs. Similarly, the use of online platforms has led to the introduction of online payment services which has reduced the headaches associated with queuing for long hours in an attempt to obtain travel tickets. This may be done in the comfort of the customer's smartphone or merely through the use of a laptop(Malik, 2018).

Robotization

Over time, scientists have attempted to come up with new technological tools aimed at making working work easier. As such, efforts have continuously been implemented where robots have effectively integrated into the economic system to reduce the costs associated with hiring human labor. Although this move has been controversial, it is also particularly important to point out the fact that such efforts have enhanced efficiency in the manner in which various operations are conducted. A good example of such instances includes the manner in which 3D printers have been introduced into the market because they are both accurate and fast. This, therefore, allows companies to enhance efficiency in resource use (money and time). Although this has been a great advantage, it is also important to point out that he has greatly rendered some people unemployed since there are better and less costly alternatives available(Schidzig, 2017).

Gig Economy

In the contemporary world, more and more people prefer venturing into self-employment. As such, most people belonging to the young generation often tend to engage in personal activities likely to earn them living before they are gain access to the vast employment field. As such, the use of mobile phone applications has been identified as one of the easiest ways in which people get to learn about new job opportunities in the economic world today. As such, organizations

also find it necessary to advertise about relevant job opportunities which have led to the deterioration of the traditional working relationships between the employer and the employee. Additionally, this also enables employees to work in different jobs in specific time zones to enhance their overall economic stability(Fagundes, 2018).

Autonomous Driving

Up until recently, developers have been able to introduce new advancements in the automobile world more so because different cars can now be able to navigate from one point to the net without the input of an individual. This has been made possible through the integration of modern tools that are mostly inclined towards moving from one point to the next without the use of human labor. If this continues to be the case, the chances are high that a significant number of people that had actively engaged in enhancing their economic means. If this continues to be the case, the chances are high that truck ad tax business could seize to be in existence which means that those in the field may be rendered unemployed. Another critical example of such scenarios involves the use of drones to make deliveries as opposed to the use of postal carriers(Zhu, 2016).

New Industrial Revolution Era

The introduction of artificial intelligence into the world's economy has consistently proven to bear a variety of economic advantages. Although this is has enhanced the economic sector, is also particularly essential to point out the fact that they also bear a significant hindrance as well. Research projects that the integration of artificial intelligence could bear significant disruptions in the service sector. This problem has been particularly common among small-scale business about the manner in which customers can effectively interact with the seller to ensure that they

have been adequately satisfied with the offered services. Small manufacturing businesses continue to encounter difficulties about the integration of artificial intelligence technology about the improvement of customer relationships.

Although the use of artificial intelligence has proven to yield positive results, experts still advice that much is yet to be done mostly since it is at an early implementation stage. This, therefore, means that much could arise regarding affecting the manner conventional economic decisions are normally conducted. For instance, the use of this technology in CRM may adversely affect sales more so if the interface utilized is not user-friendly and straight-forward. If the customer is unableto identify the manner of using artificial intelligence systems clearly, the chancesare high that they may lack the intent to conduct business operations concerning the customer service issued. Additionally, customers may be unwilling to transact at such organizations mostly since he/she may not get to inquire about any arising issues about a problem associated with the product being bought. As such, the introduction of artificial intelligence may be used as an effective method aimed at encouraging efficiency in resource use but at the same time bearing significant problems associated with poor customer relations(Zhu, 2016).

Business

The word business may be defined in a variety of ways today. As such, a business may be simply defined as efforts set aside with the aim of producing goods and services to sellto make a profit. The overall purpose of doing so is most inclined towards meeting the various needs of the society(Paolucci, 2016).

Customer Relationship Management (CRM)

As the name suggests, this concept is aimed at coming up with relevant strategies thatare moreinclined towards providing customers with relevant tools aimed at meeting their needs based on their specifications as opposed to the incorporation of company specifications to do the same(Fagundes, 2018).

4.2: Effects of robotics from AI and Intelligent Things on humans at homes and industry

Robots have had a lot of impact on all persons, not only those in the employment but also those at home. Emerging technologies like robots, AI and machine learning are rapidly getting into the market. While it has been found that the automation can lead to increase speed, quality improvement and cost reduction, they may however, displace a huge workforce. Research has shown that about 70% of the people in employment rely on the benefits for health care and retirement (Paolucci, 2016). Therefore, robots and human intelligent through the displacement affects a lot of families. 30% of employedworkforce are sole bread wienerand therefore introduction of robots leads to increased poverty for involved families. Impact of AI are already being felt at the individual level, industry level, and in the whole economy. Worldwide, the number of robots have rapidly increase in the past few years. As they become cheaper and more effective, their uptake in different industries will be high thus impacting on families and the industries at large.

It should also be noted that fewer working hours could have positive effect on families. This is because employees would have much more time with their families and friend. Consequently,

building their social life. Research has shown that especially women are favored by few working hours with 70% of workforce developing their social ties (Paolucci, 2016).

Recent advances in AI have had advanced advantages to families and the industry as opposed to the heated debates that argue contrary. As science is being actualize, it's getting to homes and indulging in industries thus affecting the way things are done. A report by Paolucci (2016)revealed that 30% of people preferred to use robots at home compared to use of human labor. It has not only been preferred at home but also at work places due to improved efficiency. This has raised debates on what would happen to humans in the long-run. However, researchers have argued that instead of just looking at home and work effect, AI should been looked form a point of solving world problems. Employing AI to things that cannot be done by humans would be of benefit to all. This would have a positive effect on people and the industry at large.

Coupling human intelligence and robotic intelligence would have effect on different industries. For instance in medicine, precision would be improved as it would improve disease diagnosis and treatment. Consequently, some medical procedure would be easy. In addition, it would be possible to cater for a huge population as compared to the low numbers that are currently attended to. There has been raised struggles to deal with the current security alerts. As of robots would help solve these problems as they would be able to fast track events. Use of drones would be able to detect crime as well as increase the level of detection.

Robots have increased agricultural production by about 14% and is expected to grow at 0.5% per annum (Malik, 2018). Results by Fagundes (2018) revealed that a lot of homes in developing countries rely on agriculture for their livelihood. Adoption of robots would increase their production and consequent increased income. In addition, robots can be used to clear markets

thus creating market access for products. This will create more opportunities for households as well as industries.

4.3: Mass automation and robotics replace of humans in various sectors

The rapid growth in use of AI and robots have been seen to get to the way of human work. Fagundes (2018) found that robots will take up human work and have consequent effect on employment and public policy. Robot prices have been falling in the recent past making them cost-competitive with human workers. In addition, there has been development of robots that can work all day uninterrupted which has made them more effective and preferred by firms to human. For instance a review by Malik (2018) found that robots can undertake stock take of a whole service sector in seconds. This required a workforce of an estimated figure of 30,000 persons.Therefore. Making robots more effective.

Like the time of great recession that forced businesses to have few workers, automation will lead to reduced number of workers which will have unemployment consequences. As business take up automated techniques, they continue dropping workers. This has resulted to increased firm value with fewer workers. For instance a survey on Google revealed that by the year 2015, the firm was valued at $370 billion with only 55,000 workers (Wynn, 2016). This was estimated to be a tenth of its work force at inception. There have been contented debates on workforce effect. Some researchers have found the effect to be significant (Malik, 2018)while other have found the changes to be insignificant (Borland &Coelli, 2017). Those that have found insignificant results argue that technology cannot eliminate human as complete substitution is not possible following the economic theory. However, on the other hand, other have argued that the substitution effect is too high and could lead an insignificant amount of human with work, therefore, rendering

about 95% of the workforce jobless (Borland &Coelli, 2017). Some have argued that technological advances lead to raised opportunities that could be utilized by displaced workforce hence leading to employment opportunities. In addition, there has been arguments of flexible security which could offer a healthcare solution, education, and housing assistance. Eased income tax credit and income redistribution could help ease the unemployment burden.

Researchers have argued that robots will take human jobs this is using the expectation that robots will take the world. A lot of firms have made use of robots though development of human-brain like robots. For instance, a review on Boston that is founded in Waltham found that the firm has been developing adaptive robots. The firm has developed sensor-based robots for different environments and thus has had an impact on employment. This is as films like the Black mirror have made use of their products reducing the number of human beings by 15% (Fagundes, 2018).

In addition, canvas technology has made application of robotics which has led to 12% drop in human force. This is as robots have been developed for warehouse management. The cart developed by Canvas has led to reduction of employees by 5%. This is as it was found that one automated cart led to reduction of wasted time by 10hrs a week (Malik, 2018).

Another application of robots has been in public safety. Like drones have been widely accepted and used for public safety. For fire response, security, and criminal justice, robots have been seen to be 50 times more effective thus leading to employees retrenchment. For instance in the Tornado damage, use of drones let to employment of a 30% of the workforce and yet led to effective results (Borland &Coelli, 2017).

Another application has been by IRobot which has been developing home cleaning and lifestyle robots. Application at homes lead to elimination of workers. This has led to laying of 12% of house helpers with an expected lay of 18% in the near future. Malik (2018) estimated that due to the high rate of robot adoption for home activities, by the year 2050, about 72% of housekeepers will be jobless. In addition, robotic developments have been towards those that are adopting to the surrounding and thus are improving. Therefore, raising the level of acceptance among consumers. Consequently, hurting employment.

Miso robots has been producing kitchen robots that have replaced workers in houses and firms. Busy fast foods have made use of the technology to be able to serve their customers faster. This has led to displacement of workers. For instance, a review on Dodgers revealed that about 75% of their workers had been displaced especially at the serving points (Wynn, 2016). Neurala on the other hand has been adding more intelligence on devices. This has led to reduced human input. Malik (2018)estimated that use of this products will reduce human employment by 14% by the year 2025.

However, robots like those developed by Rethink have shown that robots would not be able to lead to unemployment. This is so as they help increase production as well as deal with the rising demands in the different sectors. Therefore, robots will be used to take up activities to meet demand thus employment would be significantly affected. Similarly a review on Veo robotics revealed that employment could only reduce by 2% which could not have significant industry effect (Wynn, 2016).

Most applications have shown that human employment could be affected by robots. They would take up human activities thus leading to high unemployment levels and high dependency rates.

However, it should be noted that though it would lead to unemployment complete substitution is not possible. Wynn (2016) reported that AI is part of humans therefore cannot replace human brain.

CHAPTER 5: CONCLUSION AND CONTRIBUTION

5.1: Limitations and Recommendations of the Study

The major limiting factors that faced the study were on bases of time and resources. This led to deduction of a small sample for use in a research of this nature. Therefore recommend for further analysis making application of bigger sample sizes to be able to cover all industries that have been affected by automation and thus leading to more robust results. In addition, consulting firms with more time could also undertake research of this nature as it was limited by the timelines provided by the university. Also due to lack of finances, the researcher relied on secondary data sources which compromises validity and reliability. Therefore, calling for further investigations that will entail primary data collection to reveal the cases on ground.

Therefore, future analysis could extend the current review in a number of ways including; use of bigger sample sizes, use of primary data, coverage of industry by industry analysis, and a value chain context analysis.

5.2: Implication of the Study

Humans are a critical controller of how an economy should run. For this reason they are the devisers of robots and could hence control their activity. Consequently, controlling economic growth. The current review therefore could have dire implication to researchers, students, educationists, and both the private and the public sector. The government and policy makers would drive policies oriented and improved productivity and efficiency while at the same time fueling economic growth and employment through facilitation that would help engagement in new opportunities coming up due to technological advancements. The public will increase their

understanding of AI and robots and thus overcome fears of job loss. They will be able to realize opportunities coming up and thus leading to overall growth.

Universities have a role of ensuring increased adoption of technological innovations. Through training programs and orientations, they would help improve confidence and coverage as well as initiate realization of opportunities and entrepreneurial minds.

5.3: Conclusion

It is clear that, from the 1956 Dartmouth Conference, the speed at which the development of computing systems with AI has improved significantly, thanks to the human desire to solve problems using machines. Despite this, all of these research projects and studies have contributed to the development of the Intelligent Things that humans are enjoying today. Despite the fact that millions of jobs have been lost due to the use of automated machines, equipment and other objects, the Intelligent Things have greatly improved human life on earth due to their ability to enhance processes, services, and the quality of the commodities that meet human daily needs.

It should also be noted that the automations have led to creation of new opportunities, driving economic growth as well as improving lives for people at home. Robots more specifically due to the advancement to those that are adaptive and can earn with time, they have been able to improve productivity, efficiency and time saving. Also they have been a cheap means leading to achievement of economies of scale. Humans' brains have been used to develop the automated machines and thus they cannot substitute humans as humans are more superior. Therefore could use the innovations to make much more discoveries that could resolve the unemployment fears. Finally, mass automations and more so the robots should be seen as an opportunity to driving the

economy. It should not be taken in exclusion as it has been used for many years with adoption in almost allsectors. Hence instead of resisting to change and being driven by the fears of technological advances, humans should use them as opportunities to the next level.

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