

**Technological Advancement of Robotics and UAVS, and How They Pose a Threat to  
Human Jobs in the Future**

Research Dissertation

by

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**Dedication**

I dedicate this thesis to my family, friends (Associates), and country. Without the hard lessons of life and its experiences the completion of this work would not have been possible.

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**Acknowledgement**

I would like to express my special appreciation and thanks to my supervisor [Supervisor Name] you have been a tremendous mentor for me. I would like to thank you for the continuous encouragement, motivation, support, dedication, valuable guidance, sharing your expertise and your time you gave me during my research. Your advice and patience on both research and my journey as a student have been priceless. I also would like to thank all the lecturers in the [Faculty Name].

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**Abstract**

This research is aimed to evaluate the threats of technology advancement to human jobs in future, though paper is focused on risk factors that would have been caused in future due to replacement of human factor. Although the service robotics is an issue in which technological innovations are amazing and remarkable results (ranging from self-driving car, the exploration of Mars, from tele presence in business, recreational and educational robotics at home and school), there is a subset that attracts even more attention and expectations of the general public, and that is what the drones increasingly protagonists in the newspapers, even those not specialized. Furthermore, paper provides a conclusion of complete research and mentions new research topic in section of future researches in Chapter five.

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## Chapter 1: Introduction

### *1.1 Background of the Study*

This research aims to highlight the technological advancement of robotics and UAVs, and how they will pose a threat to human jobs in the future. Robotics is the combination of engineering, mechanical, electrical and computer sciences which deals with the construction, design, application and operation of robots. Additionally, robotics include system controls, sensory feedback and processing of information. From the basic definition of robotics it can be argued that it might pose threats to human jobs in future as robots can handle every operation systematically and error free (Smith, 2015, p.56). The real world is more complicated than our imagination, making a simple modelling of robotics impossible. Therefore, evaluation of what actually works, and its limitations, should be applied to the real world to develop and study the system integration technology and the individual elemental technology of the robots. In fact, there is no guarantee that the newly discovered issues within a specific problem can be resolved by the application of the existing models in robotics. Research and development of the robot, therefore, must proceed by repeating the experiment in a realistic environment as much as possible (Chin, 2014, p.90).

To design effective robots to work properly in the real world, the individual element technology is of course important. But it is also necessary to appropriately manage the channels of information because the imminent implementation of services like drones being able to bring books and packages directly to the balcony of the house does not seem to be just around the corner, considering the technological challenges still to be overcome to achieve these objectives (Smith, 2015, p.156). While one cannot say that everything is now resolved, it is definitely true

that extraordinary achievements in the field of autonomous flight have already been made and objects of this type are readily available. Furthermore, this research focuses on the use of robotics in our daily life and how it has and could further replace human jobs over time (Chin, 2014, p.90).

### ***1.2 Overview of the Study***

There are about 4 million robots according to some estimates; however, the annual sales of specialized robots in various services, such as household cleaning and entertainment, project a strong increase in the use of robots. In 2013, in fact, sales in these areas increased by 34.5%. Given these numbers, it is natural to wonder what the future of the workers is once the robots have learned to do for free for which men are paid. There is no unanimous opinion on the matter. Several economists and industry experts believe that robots are a serious threat to employment and the income of employees, while others are much more optimistic (Smith, 2015, p.230). The advance of robots would be so rapid as to make jobs disappear faster than the new technologies are able to create. Robots until 10 years back used to be just a fun device or mostly a form of toys (Chin, 2014, p.90).

Be that as it may, now robots can be found in numerous social spots. We are used to laughing at stories from Japan of robots serving espresso and welcoming guests to homes. But now these mechanical people are with us and have arrived in London, New York, and indeed, in the form of literature where people read about the forecasts that robots in future could love and hate. In the recent past, people began to opine that it was time we accumulated a rundown of assets for what's to come against our autonomy (Smith, 2015, p.320).

### ***1.3 Research Aim and Objectives***

The main aim of the research study is to highlight the technological advancement of robotics and UAVs, and how they will pose a threat to human jobs in the future. The research intends to achieve this aim from the following objectives:

- To analyse the impact of technological advancements over human jobs
- To analyse the jobs that are at threat with the advancements in the field of robotics and UAVs
- To identify the factors that has led towards supporting the use of robotics in industries

### ***1.4 Research Questions***

Based on the research aim and objectives, the following key questions are formulated:

- What will be the impact of technological advancements over human jobs?
- Which are the jobs that are at threat with the advancements in the field of robotics and UAVs?
- What are the factors that have led towards supporting the use of robotics in industries?

### ***1.5 Problem Statement***

Rapid progress in information technology brings artificial intelligence and robotics together with the evolution of new softwares, which leads to a large amount of unemployment. It also results in a further expansion of the income gap in the economy, leaving a devastating impact on the society.

### ***1.6 Significance of the Study***

The future prospect of jobs would be dependent on robots and would have become a part of our life. Modern robots are generally utilized as a part of the construction. Military and police associations use robots to help themselves in unsafe situations. Robots are offering specialists some assistance in achieving more exactness in the working environment, performing more securely, and implementing less intrusive strategies (Chin, 2014, p.90). There is good chance that the car we are driving had been constructed with a significant influence and involvement of modern robots. In the event that you eat treats, for example, of the Milano brand from Pepperidge Farm, there are robot sequential construction systems in place to manufacture and pack them. The PC we use to communicate, explore and interact in all likelihood owes its existence, in part, to mechanical robots.

Mechanical robots are also utilized as a part of the medical field, from pharmaceuticals to surgery. Robots are really great at wading through immense reams of information to discover conceivable medicines for maladies. IBM's supercomputer Watson is collaborating with twelve clinics in the US, offering guidance on the best medications and the scope of growth in them. Utilizing vision programming created by the firm, it is additionally spotting early skin cancers. Robots for a considerable length of time have been offering specialists some assistance in performing surgery at Guy's and St. Thomas' NHS Foundation Trust. For instance, robots help specialists with keyhole kidney surgery. The success rate is an essential component in the accomplishment of such operations and it has been noted that robots can sew veins interfacing kidneys significantly more rapidly than people.

Mechanical surgery is not foolproof, however, but a wellbeing report observed that machine-based surgeries were connected in the UK throughout the last decade (Chin, 2014, p.80). At the present moment, robots and humans may work next to each other in medicine yet it

may not be a general situation. Specialists aren't liable to charitably surrender control of their patient's treatment to manufactured minds. In robotics, particularly in robotics called "service robotics", the robots are coming from research laboratories and from the limited area of industrial automation. Robots, however, are also beginning to appear in other contexts (such as office, home, cities) and their intrinsic characteristics (the ability to interact with the physical world, flexibility of use, the help they can provide when carrying out hazardous work or in emergency conditions) lead many experts to consider them as one of the most promising of the emerging technological trends, one that can change our lives daily to a magnitude equal to, if not more, the spread of PC and mobile phones.

The name most generally recognized for what we call "drone" is UAVs (Unmanned Aerial Vehicles) or what is more recent, the RPA (Remotely Piloted Aircraft). These acronyms refer to the aircrafts that are not controlled by a pilot on board. These aircraft can be controlled by a pilot or remote (located on the ground or on board another aircraft) or by an autonomous system. The latter case is an area in service robotics, where the presence of a pilot is normally destined to supervision function or intervention in critical situations (Chin, 2014, p.120).

### *1.7 Organization of Chapters*

**Chapter 1:** Introduction – This chapter has covered the background of the study, an overview of the study, research aim and objectives, research questions, problem statement and significance of the study and the structure of the dissertation.

**Chapter 2:** Literature Review – This chapter evaluates the previous research on the research topic, which helps to fulfil the identified literature gap. Thus, the focus of this chapter is on the

contributions of the technological advancement in robotics and UAVs and their threat to human jobs in the future.

**Chapter 3:** Methodology – Chapter three describes methodology of proposed research, whereby qualitative methodology has been selected to study the threats of robotics on human jobs in the future.

**Chapter 4:** Data Analysis – This chapter discusses the results and findings, and the findings are based on the justification of the research objectives and questions. Moreover, these findings are discussed against the literature review to extract new insights.

**Chapter 5:** Conclusion & Recommendations – This chapter compiles all the key point of the research study, about how the advancement of technology will pose threats to human job in the future. Furthermore, it presents recommendations that could be considered in this regard.

Moreover, this section includes implications for future researchers in the area of technological advancement of robotics and UAVs and their various threats to human jobs.

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## Chapter 2: Literature Review

### *2.1 Robotic Revolution*

In the future every job from the grocery store to the floors of the factory will become common tasks to be performed by robots and UAVs. The ability for automating tasks and utilisation of artificial intelligence will augment the everyday task, and there will be a massive change in the nature of the workforce as more and more robots will start to enter the workforce, taking over the jobs which were previously being performed by human (Hagerott, 2014).

There is nearly a fifty-fifty percent chance that the robots will take over the labour market in United Kingdom. According to a research conducted by West, (2015) it was found that the labour UK alone is at the risk of being mechanized out of existence. According to an approximation more than 700 jobs that are currently being held by the humans will be taken over by the robots and UAVs. The advancements in the field of robotics and UAVs will result in bringing the robots in more and more workplaces. There are several industries where the human beings will be replaced by the robots and UAVs like the development of autonomous vehicles which will be utilised almost every major auto car marker will result in threatening the jobs of cab drivers and truck drivers. Another innovative development in the field of robotics came from the Rethink Robotics by the name Baxter Robot, a robot that is designed to work alongside human factory supervisors; the robot is capable of learning to perform new tasks, by learning on the go, which is something that could previously be done by human workers only.

Furthermore, there are the robotic surgeons that are currently working alongside the human surgeons, and require human surgeons assistance until now, but they possess the capability of learning by performing and observing the actions of the human surgeons and in

future they will be able to work autonomously (Rotman, 2013). Then there are unmanned aerial vehicles like the drones, which are being utilised by the armed forces for surveillance, but recently Amazon has started the utilisation of drone for delivering items to the people, which will result in the loss of jobs of people working in delivery companies like DHL and TCS.

According to the research conducted by the McKinsey Global Institute by the end of 2025, robots will be able to produce an equivalent of more than fifty to sixty million workers in both service and industrial roles. Giants like Amazon, Apple, and Google are making heavy investments in the field of robotics, and every year more companies are looking to make investments in this future technology. According to an estimation by 2018 there will be more than two million completely operational industrial robots working in different industries. In another study conducted by Smith, and Anderson, (2014) it was found that the robots, UAVs, along with other networked, automated artificial intelligence applications will result in displacing the jobs of more than 45% of the human beings.

Hence, the robotic revolution will surely transform the global economy, and in the next twenty years the impact will be more fearsome for the human workers as the integration of robotics in the industry will cut down the costs of performing different operations. However, this will also result in raising the social inequality, as the machines will by then almost take over almost every job that is currently being performed by the humans (Frey, and Osborne, 2013). The robots will also be able to perform manual jobs like they will be hovering in our living room, and they will be able to assemble different parts of the machines. More advancements in the field of artificial intelligence means that the computer will develop the ability to think and make decision and more importantly they will be capable of performing analytical tasks which currently only the humans can perform.

Therefore, it could rightfully be said that we are currently being faced by the robotic revolution, which will have a huge impact on the manner in which the human being work and live. With the increasing of disruptive technological innovation growing rapidly going from linear to parabolic, the penetration of robots, and UAVs will hit the industrial sector, and it will become its integral part. More, importantly this revolution will lead to the loss of jobs of more than 45% of workers in United Kingdom alone.

### *2.1.1 Robotic Revolution and Transformations in the nature of work*

The intelligent digital agents, self driving cars which can act and the robots in the industry will rapidly displace a significant number of human being from jobs and not only those working in the blue collar industry, but they will also take the jobs of the humans working in the white collar industry (Tomić et.al, 2012). Furthermore, this robotic revolution will also increase a massive inequality, as there will be a large number of unemployed people, and there will be breakdowns in the social order. Some of the major jobs that are under threats with the introduction of robots are the jobs of the manufacturing worker that are relatively low skilled workers in the industries of United Kingdom. With the ability of reducing the cost the industries will opt for robots rather than hiring more number of workers. Even though financial advice currently seems to be like a job which only the humans can perform but in the future financial analysts will be replaced by the robots as their will be highly sophisticated algorithms that would replace these financial advisors and these algorithms will be able to their responses to an individual's circumstances (Ferrein, 2015). Finally, will be the doctors, according to an estimation more than 500,000 surgeries have been performed by robotic surgeons alone in the US, along with that there are several machines being developed capable of performing diagnosis over the patients. Hence, a major risk with the advancements in the field of robotics, and UAVs

will the potential that they possess for increasing the polarisation of the labour forces, specifically for the job that are low paying like the service occupations, and at the same time it will hollow out the middle income manual labour jobs.

## ***2.2 Technological Advancement***

The history of technological progress shows that new technologies cannot always replicate and improve operations performed by human personnel, and human labor is continually moving towards tasks that are of less mechanical nature, demanding the use of analytical skills and decision-making with respect to particular situations. This is where the unique creativity of the human workforce is recognized (Smith, 2015, p.56). Technology provides resources for more complex tasks leading to increased productivity, making it a tool that assists and improves the human potential. This is confirmed by the decline over the years in the percentage of the population working on farms, then in the industrial sectors, and finally with the second half of the last century in the tertiary sector of services. Also, part of the benefits of industrial production is that the cost of labor is lower, especially in the emerging economies, as a result of which the services sector is increasingly taking this path.

In economic terms, the compensation of low-skilled labor projects a negative and downward trend. In the advanced countries, however, the concentration and the need for low-skilled labor is increasingly being reduced in favor of a growing demand for increasingly trained and qualified staff, especially in areas where the intense use of new technological tools is required. So apparently nothing really new under the sun, but the increasingly powerful capacity for action and decisions of modern robots could abruptly tip the balance in the power relationship between men and machines in the labor market (Smith, 2015, p.56). White-collar

workers would be subject to a selection process compared to what we have experienced in the past, i.e., the blue-collar face of new industrial machinery where only those with more skills will be able to find work and an attractive compensation, while for others the alternative to unemployment will be low paid jobs. Unanimous is the concern that the educational system is not able to train the staff that is going to play a vital role in the increasingly challenging workplace environment, but appropriate reforms are not in view in this regard.

On the other hand, one should not underestimate the infinite human capacity for invention, capable of turning every issue into an opportunity for improvement and success. Many inventions, including some recent ones, were absolutely unpredictable or unforeseen even a few years ago and have upset the predictions of many prophets of the end of the world, like Malthus and Marx to name just a few.

Another reason to be hopeful is, paradoxically, the excessive optimism of much of the past, which not only speculated the flying machines at the dawn of the third millennium, but also, more importantly, that the working days would increasingly become smaller (down to four hours or less) because of the increased productivity of the staff. Unfortunately, things turned out differently; in fact, there are those who claim that machines will never be able to reproduce the more advanced activities of human beings as a satisfactory substitute for work because of the costs of such advanced technologies. Therefore, the anthropocentric camp claims, the higher activities will always remain the prerogative of the human race (Smith, 2015, p.56). To sum up, as for the future, researchers are divided between optimists and pessimists, but it is important here not to overlook a large section in the middle instead of black and white. While it is certain that robots and automation technologies will have a growing role in our work, it is not possible at the moment to say from what point forward the risk will become serious (Smith, 2015, p.56).

### ***2.3 Employment versus Automation***

Unemployment is a social evil that threatens to undermine dramatically the real economy of a country. Alongside economic factors (such as the crisis) that have led to the increase in unemployment, structural factors coexist that should be carefully kept in the foresight because in the future it would have a great impact on the status of work. Economic and structural factors are constantly evolving and are subject to significant changes over time (Smith, 2015, p.56). Today, in the midst of what is called the new industrial revolution, the jobs are threatened by a number of variables that are prevalent in our economic system, especially the robotics and automation of production processes. In recent times, the accelerated complexity of the economy had already been foretold by John Maynard Keynes in the early twentieth century, who coined the term technological unemployment to define the fact that the discovery of the means to reduce the use of labor proceeds faster than the same discovery of new uses for labor. Before Keynes, Marx also had predicted a future tragically similar to his (Smith, 2015, p.56).

### ***2.4 Innovation in Technologies***

At the base of everything, there is Moore's Law or rather, the extrapolation of an observation by Gordon Moore (co-founder of Intel, the famous manufacturer of microchips). Already in the sixties, he realized that the speed at which the power of the silicon processors is growing far exceeds the rate at which the prices were growing in the computer market. His findings led to the formulation of the theory that the power of processors doubles (or their price is halved) every 18 months. But what has this to do with the increase in unemployment? The power of computers and the introduction of robotics are changing many areas where human activity was predominant or essential. The intelligent machines are replacing many professionals

or will do more so shortly, and there are others who fear that in a not too distant future, the wealth will be in the hands of those who can control the robots and better interact with them, while the fate of others will become more and more precarious. Traditional domestic workers have already given way to more technological automation (Smith, 2015, p.56).



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### **Chapter 3: Methodology**

The methodology chapter will be a thorough review about the research designs and the techniques used in the research, data collection and skimmed analysis on the basis of the data achieved. The chapter will also be covering about the ethical intervention being considered while the data collection along with the statement of the targeted population. The research processes involved since the inception of the research along with the data achieved after thorough analysis along with the statistical tools being used to calculate the result.

#### ***3.1 Research Design***

For this research study the research will use qualitative research methodology, the reason behind the selection of qualitative research methodology is that it is broad methodological approach encompassing of a wide range of research methods. However, the aim of the qualitative researcher varies according to the disciplinary background (Taylor, Bogdan, and DeVault, 2015). For this study the researcher has selected qualitative researcher methodology as it will enable the researcher to answer the why the advancements in the field of robotics and UAVs will take the human jobs away, and what steps can be taken by the humans to c-exist with machines in the future.

For this study the researcher will use qualitative secondary data, it is a data that has already been found other researcher in the field. The data will be used by the researcher to achieve the researcher objectives (Marshall, and Rossman, 2014). The different type of sources that will be used by the researcher in this study includes; peer reviewed articles, researcher papers, and thesis. The reason behind the selection of qualitative secondary method for this study is the ability of the secondary data to provide rich data which could be extremely helpful for the

researcher. It would enable the research to save a lot of time and effort and utilise the time available at hand in a more effective and efficient manner to complete the study more comprehensively. Along, with that it will also enable the researcher to understand the point of views of different researcher over the topic under study.

### ***3.2 Research Approach***

For this study the researcher has utilised inductive approach, since the researcher has moved from specific observation towards much broader generalisations (Maxwell, 2012). In this study inductive approach was adopted as the researcher initially began with specific measures, and observations, and then in the next phase the researcher detected certain patterns and on the basis of those patterns researcher formulated certain tentative objectives which could be explored through the research and then finally ended up with some general conclusions.

### ***3.3 Data Collection***

For this study the researcher collected secondary data, the data for the research for collected by the researcher alone, as the researcher wanted to collect data specific to the researcher topic, and at the same time the researcher also wanted to ensure that the data is collected only from the highly authentic resources in order to ensure the authenticity and validity of the study. The data for the research was collected from authentic libraries like the IEEE, Ebsco, Emerald, and Science Direct. The reason behind the selection of these libraries is that these are all highly authentic libraries that consist of peer-reviewed articles and more importantly these libraries have dedicated sections for research papers over robotics and UAVs.

### **3.4 Data Analysis**

For this study the data was analysed using thematic analysis. Thematic analysis could simply be explained as the categorising strategy for the qualitative data (Vaismoradi, Turunen, and Bondas, 2013). Through this method the researcher for this study reviewed the studies and made themes, and began the process of categorising of data. The researcher used the style of a data analytic strategy, which helped the researcher in moving the analysis from a broad reading towards the discovery of pattern and more importantly it lead towards the development of themes for the researcher study.

### **3.5 Limitations**

Even though it is quite easy to find and collect secondary data for the researcher, however, there are certain limitations that are associated with the collection of secondary data. For this study the researcher ensured that all of these limitations are ignored. Some of the major limitations associated with secondary data is that it can be vague and general and might not be useful for the researcher at all. The collected information might not be authentic, and accurate. Thus the researcher only selected data from authentic sources. The outdated data must always be neglected.

### **3.6 Validity**

The theoretical foundation brings different conceptions of validity, presenting an exhibition of different ways of measuring the validity, with an emphasis on qualitative research, and a brief discussion of the underlying context and logic every design and every kind of

scientific research. Ensuring the validity begin with the direct understanding of what should be measured, and is therefore a matter of priority formulation research.

In qualitative research, the concept of validity assumes different forms, for the discussion of measurement ranges does not apply to qualitative methods, requiring an understanding of validity in another perspective. In addition to asking questions, what can be understood as a prior valid, the validity seeks to show what constitutes a well-researched, reliable, worthy of being published to contribute to the knowledge, or as defined initially presented to the valid term that has value, effective. The validity in qualitative research is a theme explored there are already about half a century, with greater emphasis in recent years. Although its origins are the assumptions adopted in the quantitative research, it has been adapted and also used in qualitative research.

### ***3.7 Reliability***

In secondary research the validity is performed by validating the information. This usually involved the process of analysing the truthfulness of the selected source with respect to the information that is presented in the source. Therefore, for this study the researcher ensured that the studies selected for the thematic analysis were from authentic sources, and all studies were in the last five years. The researcher neglected all the studies before 2010, in order to ensure that only the latest studies are included in this study.

## Chapter 4: Findings and Discussion

### *4.1 Impact of Technological Advancements over Human Jobs*

The results of the study revealed that by the passage of time more and more companies will opt towards replacement of the human workers to whom they have to pay heavy wages with machines. In the study conducted by Frey, and Osborne, (2013) it was found that the jobs in United Kingdom, specifically the ones that entail production, administrative, and cleric tasks will be the ones taken over by the robots. The researcher further stated more than these jobs, there are other wide array of jobs which will be taken by the robots as more companies will prefer the automation in the coming years which would include customer service, and sales jobs, along with several other leisure occupation jobs.

With the advancements in the robotics and UAVS, the machines are becoming more and smarter. According to a report by Brynjolfsson, and McAfee, (2014) it was found that in the coming years million of jobs in United Kingdom will be lost due to increasing automation, among them the people who are at the most risk are the low wage workers. With the advancements in the technology the machines will gradually improve and the likelihood of the space remaining for uniquely-human skills will further shrink. However, this is not something new the negative impact of technology over the human jobs has been present since the ancient time. According to the research conducted by Levy, and Murnane, (2014) it was found that the ancient civilisation of Rome and Greece were faced with similar issue, as the advancement and industrial inventions resulted in the replacement of the human workers on certain jobs, therefore, it is a cyclic process which will keep on continuing forever.

The results of the study also revealed that advancements in the field of robotics and UAVs would have a great impact over the availability of the jobs for the people. Currently the population of United Kingdom is about sixty four million, out of which only thirty two million people are employed. More than 1 million people are employed and constantly looking for employment. The same is the case with the rest of the world as almost all industrial nations are facing high level of un-employment, and advancements in the field of technology will make this even more worse. As technology will emerge and more advancements will take place, the requirements for job and skill set will becomes much higher. This will result in a major shift in the labour market patterns. The machines already are taking over in several industries, and they are performing the tasks which could previously only be performed by human beings.

The only possible way for overcoming the replacement in jobs by robots, would be to overcome the issue of job replacement due to technology. There is an urgent need to train the people for jobs that specifically aim towards the development of the abilities that could only be performed by the human beings, like the ones which entail the imagination and a very high level of reasoning. This is the field where the human can gain an advantage over the robots. Along, with that the human could also focus towards learning and developing robotics and UAVs hardware and software and algorithms, which would open up a whole new dimension for the human beings as the robots at one end will be replacing the human from their jobs, while on the other hand it will be the human employed in factories and labs responsible for the development, designing, and programming of these machines.

#### ***4.2 Jobs that are threatened by Advancements of robotics and UAVs***

The debate regarding the fact that either machine will eliminate the human jobs have no longer remained as an academic debate. According to the predictions by the Anwar, Volkov, and Rus, (2013) by the end of 2025, more than a quarter of the human jobs will either be taken over by robots, or smart software. Another research by Fernandez et.al (2012) revealed that 45% of the existing jobs in United Kingdom are at the risk of being taken over by the machines in the coming years. According to the results of the research study some of the jobs that are at the threat of being replaced by robots and UAVs include:

**Taxi Drivers:** All over the world the taxi driver are currently employed by online taxi service providing companies like Uber. But Uber alongside other major car manufacturing companies is already looking and investing huge amount of money for the development of unmanned vehicles. In the coming year the government of United Kingdom will launch automated taxi pods, which run around different parts of the town without the need of a human driver to control the cars. The government of United Kingdom has already started to make amendments in the Highway Code to take account of driverless cars.

**Industry Workers:** Industry worker in China, USA, and UK are already being replaced by more efficient robots. Recently a factory completely controlled by robots has been built in China. The factory was built with the aim of reducing the workforce to more than 90%. More and more factories in United Kingdom are making huge investments for complete automation which in turn would result in the loss of jobs of the industrial workers on a very large scale.

**Doctors:** Recently IBM has developed a supercomputer that has been working with more than a dozen hospital in United Kingdom. The supercomputer is capable of offering advices to the patient for the treatments of a wide range of cancer, along with that through the help of the

vision software the supercomputer is also capable of spotting early-stage skin cancers. There are robots that are already working alongside doctors in United Kingdom and are aiding the doctors while performing surgeries. The NHS foundation has been utilizing robots in assisting the doctors during the keyhole kidney surgery. Along, with that the robots are also capable of performing several other operations inside the operation theatres like sewing of blood vessels, connecting donor kidneys, and the whole process is being performed by robots at a much faster pace and more efficiently.

#### ***4.3 Factors leading towards the Integration of Robotics in Industries***

According to the results of the study some of the major factors that will lead towards the integration of robots and UAVs in the industry include:

- As compared to human worker robots are more cost effective as companies currently have to pay a high monthly wages to the workers, specifically the ones possessing advanced technical skills. A simple illustration of this could be the foremen working at the assembly line of a coke factory. With the integration of robot the company will be able to cut down its costs and the only cost that will have to be borne by the company will be the installation and the maintenance costs.
- Robots are more efficient than human workers as human workers get sick, and injured while working. Comparatively robot workers will be able to work for longer hours, and far more efficiently than their human counterparts. Unlike human workers robots do not get sick and they do not even require taking a time off from their job.
- Integration of robots in the workforce will also result in increasing the overall productivity of the firms, as the robots can work for longer hours without any breaks,

and capable of performing task at a much faster pace than their human counterparts will make them the first preference of the firms.

Hence, keeping all of these factors under consideration it is quite evident with the type of advantages that these robots possess over their human counterparts are extreme and in the future they will surely replace the human worker in some of the major industries and a majority of human workers will become unemployed at the hand of these ultimate, intelligent, and highly efficient machines.

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## Chapter 5: Conclusion and Recommendation

### 5.1 Conclusions

Thus, in the end it could be concluded that the emerging technologies like the robotics and the UAVs are advancing rapidly; however, very small amount of researcher has been conducted towards the manner in which these technologies can impact the employment for the human beings in the future. Even though the advancement in the robotics and the UAV technologies can result in making certain improvement in the quality, speed and the cost of the products and goods available for us, but at the same time they might also result in displacing large number of workers from their jobs. This is the possibility which challenges the traditional benefit model, as with the advancements in the field of robotics and UAVs the world economies will experience a massive change which would be it shape of employment of fewer number of human workers, and more economies will opt for the implementation of robotics and UAVs for ensuring smooth operation of their business.

The impact of rapid advancements in the robotics and UAV technologies can already be felt all over the world, mostly in the developed economies where the installation and integration of the industrial robots have increased rapidly in the last few years. The major reason behind that rapid increase is the decrease in the prices of these robots, and their capability of working round the clock with precision and zero interruptions. These are all the factors that make these machines far more reliable, cost effective and highly competitive when compared to the human workers. With the advancement in the field of technology, by the passage of time these equipments will become much cheaper, reliable, capable, and their utilization will see a massive increase as more and more applications of these machines will be found in the economy. This will have a direct impact over the jobs of the human workers as organizations will opt for these

machines which are more reliable, competent, and feasible as compared to their human counter parts.

This recent trend towards automation and utilization of robots and UAVs for performing different operations could be linked with the Great Recession, due to which various businesses all over the world were forced to operate with a limited number of workers as employing a larger number of workers enforced an additional cost which the businesses were not able to bear in these desperate times. Therefore, various business organizations like Google, and Amazon continued to automate their business operations through the utilisation and integration of robotics and UAVs to perform their different business operations despite of hiring additional workers. All of these echo a growing trend specifically among the tech giants like Google that have received massive valuations with a relatively fewer number of workers as compared to their counterparts. In 2014 Google alone was valued at three hundred and seventy billion Dollars employing only fifty five thousand employees in total, which is a tenth size of the number of employees which were being employed by AT&T in the 90s.

Despite of all these facts there are certain experts () that disagree over the size and the magnitude of the impact that the advancement in the field of robotics and UAVs can have over the human workforce. Whereas, on the other hand experts like () warn the human beings regarding the staggering unemployment, there are others that point towards the fact that these advancements might result in the creation of new jobs in the categories of programming and designing of the robots and UAVs which will also result in the employment of various disabled workers. However, majority argues that the robots and the UAVs will have a major impact over the employment of the human beings in the future, due to the fact that they possess a wide number of features which clearly outcast their human counterparts. Thus, the future policy

measures must be devised for addressing the future of employment for human and it must account for the uncertainty of outcomes on employment.

In case the advancement in the field of robotics and UAVs are more likely to make the jobs less secure for the human, then there is an urgent need to determine ways for delivering benefits for the un-employed human workforce in the future. A significant idea in this regard could be off flexible security, which would ensure the provision of education, housing, and healthcare assistance for the humans who are not employed. Along, with the expansion in the Earned Income Tax Credit, and ensuring the provision of guaranteed basic income, along with encouraging corporate profit-sharing could be the measures that should be considered in case of continual unemployment.

Thus, the robotic and UAV hardware along with automated software and the networks are going to get more and more powerful, and their capability to perform different tasks will also increase in the future, and as a result all of these advancement will have a much bigger impact over the job market. For humans there is an urgent need to anew, and act anew. However, a major questions present in-front of the human workers is that even if they could find an alternative job, how will the displaced worker will be able to acquire the set of skills that are crucial for performing the new tasks. Hence, it could be taken as a wakeup call for all the human being to consider their future and make extra effort to acquire and practice new set of skills such as programming and development of these machines and their software's in order to co-exist with the machines in the workforce.

## ***5.2 Future Research***

The future research study could be conducted directly from the manufacturers of these robots and UAVs along with the workforce, specifically the ones working in the manufacturing sectors to determine their perspective regarding the impact that these machines can have on their jobs. A quantitative analysis will enable the researcher to determine the extent of the impact that according to the people present in the industry thinks could have over their jobs. Furthermore, the future research could also focus towards conducting in-depth interviews with the research participants as it will enable the researcher to gain more in-depth knowledge regarding the impact that the advancements in the robotics and the UAVs on the jobs of the humans.

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## References

- Alliance, N. G. M. N. (2015). 5G white paper. *Next Generation Mobile Networks, White paper*.
- Andreev, S., Moltchanov, D., Galinina, O., Pyattaev, A., Ometov, A., & Koucheryavy, Y. (2015, May). Network-assisted device-to-device connectivity: contemporary vision and open challenges. In *European Wireless 2015; 21th European Wireless Conference; Proceedings of* (pp. 1-8). VDE.
- Bangerter, B., Talwar, S., Arefi, R., & Stewart, K. (2014). Networks and devices for the 5G era. *Communications Magazine, IEEE*, 52(2), 90-96.
- Benzell, S. G., Kotlikoff, L. J., LaGarda, G., & Sachs, J. D. (2015). Robots are us: Some economics of human replacement (No. w20941). National Bureau of Economic Research Retrieved from <http://www.nber.org/papers/w20941>
- Bosworth, J. (2015). *ROBOTS IN YOUR FUTURE*. *Americas Quarterly*, 9(2), 40. Retrieved from <http://search.proquest.com/openview/0d23feef1e520bd579e7a3abe8a146d1/1?pq-origsite=gscholar>
- Brown, T. (2015). Containing exposure in 5G networks, a perspective from LExNet.
- Butler, J. (2015). 5G Spectrum Challenges.
- Chin, W. H., Fan, Z., & Haines, R. (2014). Emerging technologies and research challenges for 5G wireless networks. *Wireless Communications, IEEE*, 21(2), 106-112.
- Creswell, J. (2005). *“Educational Research (2nd ed.)”* Upper Saddle River, NJ: Pearson Education, Inc.
- Davies, M. (2007), *“Doing a successful research project: Using qualitative or quantitative methods,”* New York, NY: Palgrave Macmillan

- Giannoulakis, I., Kafetzakis, E., Xylouris, G., Gardikis, G., & Kourtis, A. (2014, November). On the applications of efficient NFV management towards 5G networking. In *5G for Ubiquitous Connectivity (5GU), 2014 1st International Conference on* (pp. 1-5). IEEE.
- Kaivo-Oja, J., & Roth, S. (2015). *The Technological Future of Work and Robotics*. International Journal, Forthcoming Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2656559](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2656559)
- Kline, J. (2013). *Consortium for Robots and Unmanned Systems Education and Research (CRUSER) briefing* Retrieved from <http://calhoun.nps.edu/handle/10945/27476>
- Kumar, M. (2007). Mixed methodology research design in educational technology, Alberta Journal of Educational Research, 53(1), 34-44
- Liotou, E., Elshaer, H., Schatz, R., Irmer, R., Dohler, M., Passas, N., & Merakos, L. (2015, May). Shaping QoE in the 5G ecosystem. In *Quality of Multimedia Experience (QoMEX), 2015 Seventh International Workshop on* (pp. 1-6). IEEE.
- Nekovee, M. (2015). Radio Technologies for Spectrum Above 6 GHz-A Key Component of 5G.
- Neuman, L. (2005), *Social research methods: qualitative and quantitative approaches* (6th ed.). Boston, PA: Allyn and Bacon.
- Smith, P. (2015). Rise of the machines as ANZ gives robots jobs. Retrieved from <http://docs.prosentient.com.au/prosentientxmlui/handle/1/1219>
- Stuart, Toby, Chris Anderson. "3D Robotics." *California Management Review* 57, no. 2 (2015): 91-112. Retrieved from <http://cmr.ucpress.edu/content/57/2/91.abstract>
- Sutton, A. (2015). 4G to 5G: evolution or revolution.

- Velez, M. (2015). Current and Future Relationships between Robots and Humans (Doctoral dissertation, University of St. Thomas) Retrieved from <http://www.mijecu25.com/miguelvelez/publications/SummaPaper.pdf>
- Vivoni Rango, A.R, Anderson, C. A., Pierini, N. A., Schreiner-McGraw, A. P., Saripalli, S., & Laliberte, A. S. (2014). *Ecohydrology with unmanned aerial vehicles*. *Ecosphere*, 5(10), 1-14. Retrieved from <http://onlinelibrary.com/doi/10.1890/ES14-00217.1/full>
- Webb, W. (2015). The problem with 5G.
- Wolff, J. C. (2015). *Technological Unemployment and a Theoretical Solution to its Imposing Threats*. *J Socialomics*, 4(120), 2167-0358 Retrieved from <http://www.omicsgroup.org/journals/technological-unemployment-and-a-theoretical-solution-to-its-imposing-threats-2167-0358-1000120.pdf>
- Brynjolfsson, E. and McAfee, A., 2014. *The second machine age: work, progress, and prosperity in a time of brilliant technologies*. WW Norton & Company.
- Frey, C.B. and Osborne, M.A., 2013. The future of employment: how susceptible are jobs to computerisation. Retrieved September, 7, p.2013.
- Taylor, S.J., Bogdan, R. and DeVault, M., 2015. *Introduction to qualitative research methods: A guidebook and resource*. John Wiley & Sons.
- Fernandez, G.C., Gutierrez, S.M., Ruiz, E.S., Perez, F.M. and Gil, M.C., 2012. Robotics, the New Industrial Revolution. *Technology and Society Magazine, IEEE*, 31(2), pp.51-58.
- Levy, F. and Murnane, R.J., 2014. Researching the robot revolution. *Communications of the ACM*, 57(8), pp.33-35.
- Marshall, C. and Rossman, G.B., 2014. *Designing qualitative research*. Sage publications.

- Maxwell, J.A., 2012. *Qualitative research design: An interactive approach: An interactive approach*. Sage.
- Vaismoradi, M., Turunen, H. and Bondas, T., 2013. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & health sciences*, 15(3), pp.398-405.
- Hagerott, M., 2014. The Cyber-Robotic Revolution and Implications for the Future: Offering a Framework and Suggestions. In *Presentation at 'Cyberwarfare, Ethics, and International Humanitarian Law' workshop*. International Committee for the Red Cross. Geneva, Switzerland.
- West, D.M., 2015. What happens if robots take the jobs? The impact of emerging technologies on employment and public policy.
- Smith, A. and Anderson, J., 2014. AI, Robotics, and the Future of Jobs. *Pew Research Center*.
- Tomić, T., Schmid, K., Lutz, P., Dömel, A., Kassecker, M., Mair, E., Grixia, I.L., Ruess, F., Suppa, M. and Burschka, D., 2012. Toward a fully autonomous UAV: Research platform for indoor and outdoor urban search and rescue. *Robotics & Automation Magazine, IEEE*, 19(3), pp.46-56.
- Frey, C.B. and Osborne, M.A., 2013. The future of employment: how susceptible are jobs to computerisation. *Retrieved September, 7*, p.2013.
- Ferrein, A., 2015. Robots: challenges, chances and risks for solving 21st century problems.
- Rotman, D., 2013. How technology is destroying jobs. *Technology Review*, 16(4), pp.28-35.
- Anwar, A., Volkov, M. and Rus, D., 2013, October. ChangiNOW: A mobile application for efficient taxi allocation at airports. In *Intelligent Transportation Systems-(ITSC), 2013 16th International IEEE Conference on* (pp. 694-701). IEEE.

Al-Shaikhli, A., & Esmailpour, A. (2015, September). Quality of Service management in 5G broadband converged networks. In *Sarnoff Symposium, 2015 36th IEEE* (pp. 56-61).  
IEEE.

Al-Shaikhli, A., & Esmailpour, A. (2015, September). Quality of Service management in 5G broadband converged networks. In *Sarnoff Symposium, 2015 36th IEEE* (pp. 56-61).  
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