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Paper 2

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Pavilion Seminar: How Will Artificial Intelligence Affect Humanity

Self-Driving Vehicles, the Advance of Artificial Intelligence, and the Future of Work

In the field of artificial intelligence, one of the most exciting and also impactful developments that has come out of the recent revolution is autonomous, self-driving vehicles. Now that the technology exists for self-driving cars to be applied in the world, it is important to consider how this will affect society more broadly and the workers within those industries. I want to consider what is currently developing in the driving-related industries as a case study into the future of work more generally, and finally interpret the feasibility of a Basic Universal Income in the future.

In the words of a professional truck driver, Finn Murphy, “For drivers like me, driverless trucks are the power loom and the sheepskin. There are about 3 million of us in the US alone (plus 600,000 in Britain), and we will soon be extraneous – roadkill, so to speak, except we won’t be dead. That makes us, as one driver said, “disposable people”. Too bad for us, you might think. We’re on the wrong side of history. Maybe so, but guess what? You’re next” (Murphy).

Murphy is right. Self-driving trucks are on the way and are going to put many people just like him out of their jobs. The various driving industries will be some of the first affected sectors of the economy for workers to feel the effects of artificial intelligence. However, artificial

intelligence, machine learning, and automation are set to radically change society in more ways as well. Many industries and jobs are at risk of being automated by artificial intelligence.

Murphy's feelings about automation are not isolated. Rather, they are the reaction of many people employed in the United States and other developed countries and are looking straight into the development of technologies that will change and disrupt the labor force.

Murphy asks, "But what's the endgame with all this technological innovation?" This is a question we as a society need to start asking. While the innovations brought by the incorporation of new technologies will bring many benefits, it will also be very disruptive to many lives. It is imperative that we start thinking about how we are going to address the problems that will be produced by job displacement that is going to become increasingly common as we progress through the century with the greater advancement of artificial intelligence.

The Driving Industry

I think the industry that is going to be one of the most affected, and also the industry that will be most rapidly changed by the nearing incorporation of artificial intelligence, will be the driving industry. The driving industry is particularly unique in that it is one of the last industries in the United States that can still offer a middle class lifestyle without tertiary education in some cases. It is also one of the largest industries in the United States having around 8.7 million people employed and being the largest employer in twenty-seven states (Santens).

What makes the industry unique with respect to the incorporation of artificial intelligence, is that the driving industry is among the last of its type in the United States; it is one of the last industries that is capable of providing a middle-class income without a college education. The average annual income for a truck driver is around 40,000 dollars. The rest of the

industrial jobs which once offered middle-class incomes have either already been automated or have outsourced overseas (Santens).

The technology for the automation of the driving industry already exists. On May 6, 2015, the first self-driving tractor trailer was tested on the road in Nevada. Daimler, the company behind the self-driving truck and owner of auto manufacturer Mercedes-Benz, has started a testing phase and will be testing the trucks over a decade-long time span. It is only a matter of time until we see the replacement of drivers with these self-driving trucks; the only thing in the way of self-driving trucks becoming a normal part of the road are not technological in nature but legal. In fact, Morgan Stanley is expecting that there will be one-hundred percent market penetration of self-driving vehicles within the next two decades (Santens).

This development has been made without even the use of technologies of more advanced technologies which have been in Google's self-driving car program, now known as Waymo. Chris Urnsome, director of Waymo, points out a major advantage to having self-driving vehicles will be their improved safety. He reports that Google's fleet of over twenty self-driving cars have driven 1.7 million miles and are now driving an average of ten-thousand miles on city streets throughout the country. After these years of testing and driving, they have been involved in only eleven minor accidents of which none was the fault of the self-driving car (Urnsome). This great level of safety is achieved by new technologies used by Waymo such as LiDAR. Standing for light detection and ranging systems, LiDAR allows self-driving cars to sense their position on the road in order to stay in their own lanes, recognize other cars on the road, and obstacles during the day or night and through different types of weather. LiDAR allows cars to drive with much greater safety due to having four times the visibility capabilities of regular human drivers.

Humans are only capable of being able to see fifty meters safely while self-driving vehicles with LiDAR are capable of seeing two hundred meters (West).

These statistics and advancements in capabilities attest to reliability and safety of the systems being developed by Waymo and other innovators in self-driving vehicles. In the United States, there are around 33,000 traffic fatalities yearly. This high number of deaths could be avoided by the upcoming incorporation of self-driving cars being developed by companies like Waymo and Daimler. Other companies have also been developing their own self-driving capabilities including Apple with its project Titan (Santens).

Uber has also been investing in development for self-driving cars to use in its services and is attempting to make personal car ownership a thing of the past. The CEO of Uber, Travis Kalanick, stated, “You’re not just paying for the car—you’re paying for the other dude in the car” (Santens). Uber is planning on purchasing 24,000 autonomous vehicles (West). Combined with their greater level of safety, and ultimately cheaper level of operation in cutting out the driver, it is only a matter of time before we see self-driving cars and trucks on the road. There is interest in developing the technology for self-driving vehicles for the added benefits in safety, efficiency, and ultimately cost reduction. While there will be many positive effects coming from this development, like improved safety, it also must be taken into consideration what effect this level of automation will have on the lives of the workers who will be displaced by the advance of technology.

Projections for Job Displacement

The driving industry could be one the first to experience major employment disruption. There are multiple factors affecting the industry that will increase the likelihood that workers

within it will be replaced including the much greater level of potential safety and the savings that will be offered by replacing the driver in the car or truck.

However, while the driving industry's automation is most likely one of the first on the horizon with some of the only remaining barriers to implementation being legal issues, this is not the only segment of the economy which will be affected by increasing automation. A report from Oxford University, when studying over 702 occupational groupings, found that about forty-seven percent of Americans face a high probability of having their jobs replaced by automation over the next twenty years. Similarly, in the European Union, approximately fifty-four percent of jobs are at risk of being automated by computers. By 2030, it is estimated that around sixty percent of jobs could have 30 percent of their job activity replaced by machines. An astounding number of workers worldwide could be put out of work, up to 375 million workers worldwide could be facing job displacement due to the automation of their jobs (West).

The automation of jobs may lead to social issues which society has not faced before. Former Treasury Secretary of the United States, Lawrence Summers expressed concerns about the level of job displacement which could be brought on by automation by artificial intelligence stating, "We may have a third of men between the ages of 25 and 54 not working by the end of this half century" (West). This expected trend is supported by the hiring sentiments of CEOs. In a study of the hiring plans of CEOs, fifty-eight percent reported that they were planning to reduce jobs while only sixteen percent of CEOs reported planning to hire workers (West 75).

This is leading to a change in the workforce which is changing to encourage part-time working instead of full-time working. Since 2010, in the European Union, more than half of all jobs created have been under temporary contracts (West 95). These changes are due to a shift in the economy which has been labelled the "Sharing Economy" that has been enabled due to the

use of mobile applications. The number of these jobs has grown exponentially since 2010 and continues to do so with examples being Uber and Airbnb. An issue arising from this shift in the workforce is the lack of benefits which are more common with permanent work is the lack of benefits associated with these jobs

There is likely to be great disruption in the labor force with more turnover in jobs throughout one's lifespan as well. In the workforce, most of the jobs being created to replace lost jobs are not of the same quality as the ones that have been replaced. There has been a decrease in the average amount of full-time positions and instead there has been an increase in the number of part-time positions that are available. Currently, about one-third of the workforce in the United States are freelancers without benefits and this fraction of the workforce is expected to increase to forty percent by 2020 (West 81). These new kinds of work have the benefits of flexibility but lack the other benefits associated with more permanent types of working like insurance.

The Possibility of a Universal Basic Income

The general increase in the abilities of artificial intelligence, it is likely that there could be increasing amounts of unemployment, turnover of workers, and more temporary forms of work in the future. Due to the changing nature of the workforce, more people will likely struggle to find adequate work and face the problems of being employed in jobs that are temporary rather than permanent in nature. The increasing use of artificial intelligence and an overall shift in the digital economy in the workforce has the potential to lead to more unemployment and greater job displacement. An old idea which is gaining attention as a solution to the problems facing society by the increasing automation of work is a Universal Basic Income.

The idea of a Universal Basic Income has existed for many years. The idea of a Universal Basic Income can be traced back to the writings of Thomas Paine. In 1796, Paine published *Agrarian Justice* which argued for the creation of a national fund to be given out to all citizens at the age of twenty-one. He stated, "... create a national fund, out of which there shall be paid, when arrived at the age of twenty-one years, the sum of fifteen pounds sterling, as a compensation in part, for the loss of his or her inheritance, by the introduction of the system of landed property..." (Van Parijs 72). The use of this sum was to ensure that young people and couples could have enough resources to begin farming. This is similar to the modern day idea of the Universal Basic Income as a way of ensuring that citizens have a basic income for sustenance.

An example of a universal basic income experiment is the MINCOME guaranteed annual income program carried out in Manitoba, Canada. In the MINCOME experiment, they were a number of benefits. The families receiving MINCOME, in contrast to the families not receiving MINCOME, reported better high school graduation rates and a lower rate of hospitalization. In the experiment, the majority of the people who received the income ended up above the poverty line and most did not quit their jobs (West 102). This is supported by Charles Kenny of the Center for Global Development, providing a social safety net does not cause personal laziness or dependency. He states that providing a basic guaranteed income, "may help lift people up and out of poverty. Give poor people cash without conditions attached, and it turns out they use it to buy goods and services that improve their lives and increase their future earning potential" (West 101).

The longest running and most noted form of a basic income is the Alaska Permanent Fund. In the mid-1970s, the governor of Alaska, Jay Hammond, secured the ownership of the

Prudhoe Bay oil field. In 1976, the Alaska Permanent Fund was founded by an amendment to the state constitution. The program first began issuing dividends in 1982. Since the 1982, each citizen of Alaska has received an annual dividend from the Fund. The amount of the dividend fluctuates based on the return of the worldwide portfolio in which it is invested. In 2015, the Fund distributed \$2,072 to permanent residents of the state. The dividend currently is about twenty percent of the official United States poverty line and overall the Alaska Permanent Fund. It is a genuine guaranteed income considering that it is sent out to adult citizens and children without any stipulations and how it is to be spent (Van Parijs 94).

Currently, Finland is carrying out a trial basic income as well. The Finnish government has selected a few communities in order to carry out an experiment of basic income. The individuals that are taking part in the new basic income program will receive nine-hundred dollars monthly. Those partaking in the program will not receive any other type of government benefits. However, they will still be eligible to receive the income if they become employed. There are similar universal basic income experiments being carried out in the Netherlands in the city of Utrecht. Also, Scotland is implementing universal basic income programs in the cities of Fife and Glasgow. The Scottish and Dutch implementations are similar to the Finnish trial in that they are unconditional basic incomes with no stipulations attached to how the money given must be spent. Due to the recent implementation of these trials, the results of the studies are yet to be known (West 101).

The concept of implementing a Universal Basic Income is driven by the disruptive effects of automation into the economy. A Universal Basic Income could be useful in ameliorating the rising levels of inequality in the United States as a result of increasing automation in the economy. One reason for the growth in inequality is the relative size of corporations in

comparison to the past. Apple and Alphabet, two of the most profitable companies have 116,000 and 72,053 employees, respectively. While the next two most profitable companies J.P. Morgan and Berkshire Hathaway have 243,355 and 367,000 employees (White 7). A result from this phenomenon is that a few companies with fewer employees necessary to make very large profits.

A main issue that will present due to increasing automation will be increasing levels of inequality. As inequality rises in an economy, there is a greater risk of social conflict and political unrest (West 104). When there is a high level of unemployment, it can lead to a high degree of discontentment. If the level of working-age men and young people unemployed continues to grow, it could lead to higher levels of criminal behavior and social unrest (West 104).

The use of a universal basic income may be necessary to offset the problems caused by disruptions in the economic system and the changing nature of work. It is expected that continuing technological growth will cause continual disruptions in the types of work people will be doing at various ages in their lives. It is estimated that around sixty-five percent of students today may be working in jobs in the future that do not yet exist (West 110). Due to this rapid change in the nature of work and the economy overall, there is going to be a greater need for continuing education in the future. These rapid changes taking place due to the changes in the nature of work could necessitate the need for a universal basic income in order to give people a reliable source of income when they may find themselves in between work. The universal basic income could also be useful in allowing people who need to reeducate in order to keep up with the level of technological change to have a way of financing their educations.

Due to the great level of change which is occurring in the economy right now, a universal basic income may be necessary in order to offset the great disruption which is very likely to

occur in the near future. In the longer term, it may be necessary to rethink what work is and expand the definition of work to include child care, care of parents, and volunteering (West 83). In the face of a very new type of economy, the old idea of a universal basic income may become a reality necessitated by the rapid pace of technological change.

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