

Moving Forward with Artificial Intelligence and Job Automation

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Today we live in a world that is being flipped upside-down by the technologies people create. Day to day, tasks such as making a bank deposit, buying groceries, or getting the car washed can all be completed without the assistance of another human, because of the phenomenon known as job automation. For better or for worse, job automation exists today, and will become increasingly more predominant in the future. Technological advancements in the field of artificial intelligence and automation have the potential to drastically improve the quality of life across the globe; however, automation is interfering with economies in ways that civilizations have never seen before. Artificial intelligence or AI for short, allows machine workers to replace the human counterpart in massive numbers. These numbers will continue to grow, and may alter our economic structure due to significant changes in wealth distribution. Furthermore, societies will need to alter their political and economically practices if they are going to prosper in an age of automated labor.

It is crucial to acknowledge the many facets related to job automation to fully understand the implications of this phenomenon. To begin, a basic understanding of artificial intelligence and robotic automation is a must. Following a basic understanding of the technologies used to replace jobs a birds-eye view of the industries being affected will provide additional context and perspective. Next, discerning the differences between human and machine labor will bring forth the motives associated with job automation. Then, the pros and cons of job automation must be weighed to determine the extent at which automation will affect the future. Lastly, predictions from specialists in the field of computing, economics, and politics should be consulted to move forward with a viable solution regarding the implications that our societies will face in the future due to automation.

So, what is artificial intelligence, and what does it have to do with job automation? Artificial intelligence is computer software that can make decisions based off statistical probabilities that are typically obtained from large sets of sample data. The software can learn what needs to be done through repetitive trial and error iterations without ever being told how to complete a task by a human. All the software needs to know is the desired result and the restrictions for getting there. Today, artificial intelligence is being coupled with computer vision to transform the way machines complete tasks. According to Brian Arthur in his article titled “Where Is Technology Taking the Economy,” computer vision combines intelligent algorithms and hardware sensors to identify objects in a similar way that a human’s eyes or ears would. When AI is combined with computer vision it can replace the tasks often completed by a human worker; thus, these technologies have the potential to replace the worker entirely.

The technological advancements used to automate jobs have the ability to cause disruptions in nearly every field that exists today. The first industries that will be hit the hardest by automation will be the manufacturing and service sectors that employ blue-collar workers. These jobs are typically “repetitive low-skill, low-wage jobs” that are the ideal candidate for automation as stated by Martin Ford in his book titled *Rise of the Robots: Technology and the Threat of a Jobless Future* (26). Jobs in the manufacturing and service industries employee

millions of people; therefore, from a corporate perspective there is a high incentive to automate these jobs to cut costs (Ford 27).

Another sector of labor that will be susceptible to automation is transportation. AI and hardware sensors are being installed into everyday cars, and commercial trucks to make truly autonomous vehicles that do not require the assistance of a human to drive. This shift in transportation has the potential to leave taxi and truck drivers, without a job (Ford 190). Also, if cars are driving themselves, it is more efficient and affordable to borrow a car then to own one. Imagine how much time vehicles sit idle in garages or parking lots. All that idle time can be utilized by other people, and if people are sharing cars then there should be a smaller number of them in circulation; therefore, our economies will need less mechanics, less car salespeople, and less car wash attendants. To put those assertions into perspective Ford claims that “In LA [Los Angeles] alone car washes employ 10,000 people” (189). Significant portions of the population will be required to find new jobs and this is just the tip of the iceberg. Some people think that job automation will only be applied to low-skilled blue-collar work, but this is not the reality we will soon be living in.

Automation is also coming for white-collar jobs that are typically reserved for college graduates as noted by William A. Nitze in his article titled “The Rising Tech Giants: They Destroy Jobs, Distort Markets, and Trample on Liberties” (27). To begin, AI software engines such as *Quill* can replace journalists by generating articles about sports, business, and politics by analyzing information from databases, sales reporting systems, and social media. The articles that are produced by *Quill* rival those written by humans (Ford 84-85). Another profession that will be influenced by automation is the medical industry. Robots such as IBM’s Watson will be used to help diagnose patients. Watson is a robot that was created to compete on the TV show *Jeopardy*, but ended up becoming a mastermind at diagnosing ill patients after defeating *Jeopardy*’s champion Ken Jennings (Ford 96-101). Watson can determine the cause of a patient’s sickness by making associations between enormous amounts of medical information found online including textbooks, medical journals, and clinical studies. Ford rightfully asserts that “No single doctor could possibly approach Watson’s ability to delve into vast collections of data and discover relationships that might not be obvious” (102). Lastly, some other fields that will see changes due to automation include finance and education. Software is getting better at crunching financial numbers, and it is also learning how to grade student’s coursework beyond multiple choice exams (Nitze 27). AI grading algorithms are learning how to assess student essays, and are providing similar scores that a traditional instructor would (Ford 129-132). Overall, automation will cause major changes throughout most industries, and a person’s level of education and skill may not exempt them from the changes that are coming.

So, automation will affect nearly every sector of the economy, but why? The answer lies in the fundamental differences between a human worker and a machine worker. Essentially, machines are less expensive to “employ” than a human worker. At organizations, each person that is hired must be trained to do a job, but with machines only one machine worker needs to be trained, and then that training can be copied to an army of other machine workers. In this context “machines and software can easily be replaced at a cost that is small compared to replacing a person” (Ford 75). Also, human workers have other costs that machines do not. People need managers and human resource staff in modern organizations. Humans need office space, break rooms, parking spots, vacations, and benefits. They also get sick, and sometimes they get hurt on the job. Lastly, humans quit, machines do not (Ford 255). Overall, companies have a burning

desire to replace the human worker, because humans are substantially more expensive to employ than machines.

At this point, it sounds like the only benefit to job automation is increasing corporate profits; however, automation also has the potential to transform the way humans live and prosper. First, automation allows civilizations to have a plethora of production. Anything and everything that people could ever need will be produced in large quantities to the point where they could not need more. In the United States and other first world countries it is arguable that we have already reached this point, but automation could help other developing countries to reach a similar quality of life. Second, automation can prevent deaths due to car accidents, and medical inaccuracies caused by doctors. Third, automation has the potential to relieve humans of tasks that may seem like a burden. Some examples of undesirable tasks include chores, driving, and most importantly repetitive job duties. If machines are doing chores and working, then what will displaced workers be doing with their time? The answer is whatever the heart desires. With more time humans have additional flexibility to pursue their passions and desires. In the future people will either work less hours or not work at all. People will be more inclined to develop new skills or hobbies. Also, people will have additional time to build closer relationships, or spend time with individuals who are sick and/or elderly. Lastly, people may use their additional free time to get involved with the community and meet new people to improve their lives even more. Automation has many benefits that can transform the way people live, but there is a catch.

If people are working less or not at all due to automation, then how will the economy be affected? The people who are displaced by automation will have less buying power, because they are now unemployed and will have trouble finding new employment due to a relentless battle against machines. As Arthur puts it “the autonomous economy is steadily digesting the physical economy and the jobs it provides.” Automation will create “a winner take all world” where the giant technology companies will accumulate a significant proportion of the wealth (Nitze 26). Those who own and maintain the machines will have a significant portion of buying power, while the average person looking for work will struggle to make ends meet. Ford claims that as automation progresses more jobs will be impacted, which in turn will lead to an increase in income inequality and inequality of consumption (227-228). The affluent few who own the machines will continue to gain more wealth and continue to consume the products being produced by machines, while most people will be losing wealth and cutting consumption of products. This will create a frightening scenario if not addressed by political, economic, and technological leaders across the world.

The current state of automation should be analyzed before moving forward with a solution to the troublesome possibilities associated with this phenomenon. Arthur explains that modern AI software associated with job automation is in its infancy, because it has only become a dominant force in the past decade or so. Although this may be true, technology grows at an exponential rate, whereas political and economic change does not, and this is a troublesome reality. The more knowledge that is discovered about AI, the faster it grows. Arthur observes that “as AI and automation come of age, the building blocks of software will become available publicly as open source software. This allows another developer to build on top of what already exists to create more efficient automation.” In the article titled "Why Are There Still so Many Jobs? The History and Future of Workplace Automation." David H. Autor asserts that “there’s never been a worse time to be a worker with only ‘ordinary’ skills and abilities to offer, because computers, robots, and other digital technologies are acquiring these skills and abilities at an

extraordinary rate” (4). In short, job automation is growing fast, and we need to weigh our options for the future, or there could be devastating consequences such as wide-spread income inequality.

Automation and AI specialists speculate how automation will affect jobs in the future. Autor is convinced that machines will supplement and complement current jobs instead of replacing them. Machines will primarily be used as tools by humans to complete tasks more efficiently. Autor also states that many jobs are still too complex to efficiently automate. These jobs are mainly in repair work where there are too many variables that require a significant amount of intuition to complete (Autor 23). In contrast, Arthur and Ford believe that automation will steadily replace the jobs of today with machines. Arthur references historical events where freed labor resources had found replacement jobs, but he is not convinced that the jobs being consumed by the digital economy will ever be replaced in large numbers. Ford sees the job market as a pyramid where the high paying jobs are at the top and the low paying jobs are found at the bottom. The jobs at the top are sparse, and the jobs at the bottom are abundant. Following this illustration, Ford says that “it’s becoming increasingly clear, however, that robots, machine learning algorithms, and other forms of automation are gradually going to consume much of the base of the job skills pyramid” (251-252). Both scenarios seem plausible, but it appears more likely that machines will completely replace many jobs. Overall, at first automation may complement jobs, but shortly after we will find machines completely replacing humans in many industries.

In the future machines will replace human workers, and this can be associated with a significant level of wide-spread income inequality, so what can be done to prevent an economic catastrophe? “Generally high employment was essential for effective functioning in a predominantly free-enterprise economy,” as quoted by John W Kendrick in the article titled “Guiding Guided Capitalism.” Employment will be low once automation takes hold of the economy. Furthermore, Kendrick believes that when industries are in decline governments should interfere by providing relocation and education to sustain economic effectiveness. Nitze, Ford and Autor all point to education as a means for retraining and relocating workers who are displaced by automation (27; 255; 27). However, education can only mitigate the effects of automation. Only a small number of educated individuals will be able to obtain jobs at the top of the shrinking job pyramid. People should continue to educate themselves, and obtain new skills, but education will not solve the issues of income inequality. It appears that the most ideal solution for the future would be to implement new economic and political practices.

Automation will force leaders across the world to adopt new policies and practices if they are to continue down the path of economic prosperity. The most noticeable voices in this conversation point to a guaranteed minimum income as a solution. Ford, Nitze, Autor, and Arthur can all agree that societies will need a new way to distribute wealth to everybody, and the way this will be done is through a minimum income guarantee.

Beyond a guaranteed income, a viable option is to embrace the idea of guided-capitalism. Kendrick describe guided-capitalism as the “convergence of socialist and free economies” in an effect to employ all available resources. In addition, practices that have been used in Scandinavian countries to improve social capital should be adopted. Social capital is essentially the shared assets between people in a society. In the article “Introduction: Social Capital in Scandinavia” B. Rothstein and D. Stolle acknowledge that Scandinavian countries are recognized for erasing almost all forms of severe poverty and social inequality (7). Also, the countries in

Scandinavia have been known to have close collaborations between the state, and major organizations to plan and prepare public policies. These organizations are given seats on the board of government agencies to provide feedback for making political decisions (Rothstein, B. and D. Stolle 8). These close ties between business and politics coupled with collaboration between the social democratic party, worker unions, and educational organizations allow Scandinavians countries to have a low level of income inequality (Rothstein, B. and D. Stolle 9). If the ideologies of Scandinavian countries and the concept of guided-capitalism are combined with a guaranteed minimum income for individuals, then governments may be able to prevent economic downturn due to automation.

In conclusion, AI and automation are transforming the world we live in by replacing human workers with machines. Automation is in its infancy, and must be handled delicately if societies are to reap the benefits that can come from this phenomenon. AI and automation can improve the quality of life across the world, and has the ability to save lives in the fields of transportation and medicine. Lastly, automation can give people more time to build strong relationships, and more time to pursue their passions and dreams, but these perks will only come of age if political, economic, and technologic leaders can come to a consensus about the state of automation and its effect on the economy. If we do not act now by implementing new policies that focus on wealth distribution, then societies will see unfathomable poverty, political unrest, and possibly economic collapse. Technological acceleration is inevitable, and as Nitze petitions “Only by being prepared to take collective action to ensure that its benefits are equitably shared and to curb its misuse can we guide that change in directions favorable to us as individuals and to humanity as a whole” (28).

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