

Siddharth Mangalik

Professor Suver

CSE 300 Section 3

17 November 2017

Research Proposal: Human Jobs Post-Automation

Automation currently stands as the greatest factor in the development of the human job market in industrialized nations. Automation or computerization is the practice of taking a job with clearly definable procedures and then allowing a robot or computer system to complete the task without human help. This allows companies and individuals to reliably manufacture goods or supply services around the clock. The conflict of interest lies in the widespread adoption of automation increasing socioeconomic stratification among humans in the current job market. Nonetheless there is great incentive for incorporating automation into most businesses given the large benefits it attributes. This should raise concern for workers worried about social mobility and all humans worried about social and economic equality. If there exist some investments that we can make into the human job market that will alleviate these issues, research should be completed to determine where those investments would be most meaningful. I propose research be done to determine where resources should be allocated to minimize the stratifying effects of automation on humans.

In order to discover the root cause of the issue we will examine how the current body of research describes the effects of automation. Carl Frey and Michael Osborne conclude that most unskilled labor which does not involve some layer of creativity or intrapersonal relations has a high risk of being automated. While a majority of unskilled and low class jobs are likely to be

fully automated, there does not exist an economic model which suggests they will be eradicated by high initial investment computer systems. Darrell West continues on this process by identifying a shift in new companies' hiring practices towards hiring fewer employees. With fewer jobs being created by traditional middle class employers we see an increase in demand for employees with higher education and technical skill sets. This would ramp up the difficulty for unskilled workers to progress into middle class jobs with better wages and job stability. We would then enter into a feedback loop where middle class workers become disenfranchised in their futures and are less able than before to move up in society. McKinsey & Company further examine the modern work pipeline and whether subsections of it are automatable. Their findings are that a majority of today's workflow can be automated with only a small remaining percentage being creative or intrapersonal. They conclude this will further increase the demands for workers with competitive skills and post-secondary education.

Looking to the future while considering these factors brings us to our predicted outcome. Lawrence Summers' analysis shows that while automation will increase wealth and a boost in production will create more jobs, automation will also catch up with this development and outpace the rate of job creation. This short term creation of jobs does not bode well for our current job market and will remove most existing automatable jobs with high human costs like service and management. James J. Hughes resolves that if the current trajectory is followed, social equality will hit a new low with most workers being unable to get high paying jobs other than an elite few. This would necessitate the creation of a basic income program to supplement the lives of the working class. Offering a contrary position, David Autor posits that to avoid social disparity it is possible to invest in the development of human workers. By providing

programs that allow more humans to obtain a higher education and relevant work skills, we can lower the boundaries on future skilled labor positions. A lot of social inequity can be avoided by allowing humans to succeed in the job market when new technologies and fields arrive.

This is certainly not the first shift we have seen where technology has displaced large amounts of workers into new fields. Workers from agrarian societies of years past would not be able to function in our modern day world with the skill sets they acquired. Just as we required all workers to a minimum of a high school diploma, we will need to determine what skill level the next generation will require to stay competitive and relevant. It is then imperative to determine what kind of investments we can make to mitigate the job loss that will result due to automation. By conducting research we will be able to predict the future based on the past and present trends connecting technology and the workplace.

The proposed research will need to be jointly historical, economic, and pedagogical. We split the research into two sister phases: In the first we will determine what technical and personal skills are difficult to automate, while in the second we will analyze countries whose job markets are embracing automation and analyze any developments in their curriculums and budgets. Combining these two parts will allow us to design a new curriculum with the intention of withstanding the economic influences of computerised skilled labor. We will survey industries where humans and machines work side by side to learn about the tasks of the workflow that are still done by humans. This will help us recognize the qualities of tasks which are not easily automated. As we noted earlier, these tasks are typically either creative and/or intrapersonal. There may be other qualities that are not automatable that we can identify. One example of this

kind of insight can be seen in windshields installation. Machines install windshields but only humans possess the flexibility and dexterity to repair and replace windshields.

In the next part of this research we will examine other job markets outside of the US that are also susceptible to automation. We will want to track the progress of the South Korea's job market over the past decade. This sample size will allow us to analyze the active changes within a single nation's economy with the highest current rate of automation of any country. Data can be collected from historical employment and academic achievement records as well as research conducted on education in newer fields from engineering and computing.

Most research conducted into the effects of automation falsely assume that the inevitable outcome will be mass human unemployment. Economic and market research demonstrate that modern automation will not replace humans but rather polarize available human-based careers by wage. Thus we should create plans and scenarios that will foster a robust working class capable of excelling at human tasks. Instead of trying to take on the insurmountable task of Futurology, trying to predict the exact fields that the future will reward, we can instead aim to give a rounded education that will apply to the needs of future employers. This research will uniquely explore the effects of moving industrial trends towards what cannot be automated. When coupled with research into how other nations have already adopted automation, a clearer holistic view of how to manage an evolving job scene is possible. This research will ultimately allow us to gather information about where humans can improve to bolster our strengths and avoid replacement.

Bibliography

Autor, David H. “Why Are There Still So Many Jobs? The History and Future of Workplace Automation.” *Journal of Economic Perspectives*, vol. 29, no. 3, 2015, pp. 3–30.

Chui, Michael, et al. “Four Fundamentals of Workplace Automation.”, McKinsey & Company, Nov. 2015.

Frey, Carl Benedikt, and Michael Osborne. “The Future of Employment”. Oxford Martin School, 2013.

Hughes, James J. “Are Technological Unemployment and a Basic Income Guarantee Inevitable or Desirable? .” *Journal of Evolution and Technology*, vol. 24, no. 1, Feb. 2014, pp. 1–4.

Summers, Lawrence H. “Lawrence H. Summers on the Economic Challenge of the Future: Jobs.” *The Wall Street Journal*, Dow Jones & Company, 7 July 2014,

West, Darrell M. “What happens if robots take the jobs? The impact of emerging technologies on employment and public policy.” Centre for Technology Innovation at Brookings, Washington DC, 2015.