A Brief Look
Into the Parallels of
Technological Advancements;
Yesterday and Tomorrow

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Contents

Abstract

As civilization marches ever onward, the concept of technological advancement causing disruption to the economy is revisited. It is revisited because civilization has encountered technological advancement, in some shape or form, in the past during the Industrial Revolution in Great Britain in the 16th to 18th centuries[1]. Though there are inarguably many differences between the two forms of automation in the past and that society now will soon face, the paper will instead focus on their similarities. Many parallels can be drawn from history and the following three will be in focus; loss of jobs, forms of protest in opposition and the idea of secured wages. With the rise of technological advancement, 'low qualified' workers are the first to be prone to the effects though, with time, 'higher qualified' workers may be effected as well. Opposition to technological advancement is also seen whether in the form of protests, as back then with the Luddite outcries, or in the form of government intervention. Finally resolution methods, specifically in the form of basic income wages to the populace, can provide a means of dealing with the eventual problem of technological unemployment.

INTRODUCTION

Technological advancement has often times in the past been attributed with fears of displacing workers, leading to the idea of technological unemployment. With regards to contemporary society, fears have recently began resurfacing; that forms of sophisticated automation will result in mass worker displacement[2]. The fundamental issue is automation and even digitalization are increasingly penetrating the domain of tasks that until recently used to be genuinely human such as decision making and basic logical reasoning. Just at the brink of horizons are certain technologies like the self driving car, largely automated factories (examples already exist[3]), service robots and 3D printing. These technologies are driven by advances in computing power, robotics and artificial intelligence which then ultimately push the boundaries on what type of human work machines are able to do and take over.

With that in mind, there was and undoubtedly will be backlash with further use of technological advancement to shift away jobs from people themselves. This may come in the

[1] Sir John Habakkuk in American and British Technology in the Nineteenth Century (1962), Cambridge University Press

[2] Rifkin, J. (2004). The end of work: the decline of the global labor force and the dawn of the post-market era. New York: Tarcher/Penguin.

[3] Shead, Sam. "Amazon now has 45,000 robots in its warehouses." *Business Insider*. Business Insider, 03 Jan. 2017. Web. 01 July 2017.

form of public protests or government intervention to curb areas where technological advancement may cause human work disruption. These sort of acts should not be unusual and may very well be expected in the near future for contemporary societies as history has already documented such cases in the past. In 19th century England, Luddites were a group of textile weavers who feared their craft would go to waste as machines would replace their role in the industry[4]. Raids and oppositions against factory owners were carried as unrest grew about the losses they suffered to their work. Today, interesting parallels can be drawn; although not as violent, protesting ride sharing services such as Uber was clearly seen in the city of Calgary. While Uber may not be viewed exactly as automation, it still is some form of technological advancement where traditional workers are displaced and the company itself foreshadows towards automated fleets[5]. As such, municipal level of government had to be involved to facilitate and integrate Uber, creating some setbacks. Going back to the late 1500s, a famous quote by Queen Elizabeth I, being of modern day government equivalent, declines to issue a patent on the grounds that technology might cause unemployment among textile workers;

> *"Consider thou what the invention could do to my poor subjects. It would assuredly bring them to ruin by depriving them of employment, thus making them beggars."*[6]

These sort of acts, however, only serve to delay progress in the short term and are not long term solutions. Protesting and government restrictions can only go so far until the point where technological advancement simply cannot be ignored. That point will be reached, whether 20 years down the road or postponed to 40 years, where nearly 50% of jobs will be affected by technological advancements, according to researchers at the Brookfield Institute. It is at that point where future looking solutions are sought to aid the workers that may be affected by job loss. One such solution could be the introduction of universal basic income. There are polarizing views on the matter, such as people getting lazy, to more hopeful ones where people out of boredom raise their potential into doing more. The specific numbers as to what that wage numbers should look like won't be discussed in the paper though the assertion that universal basic income is needed will be supported.

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[4] Andrews, Evan. "Who were the Luddites?" *History.com.* A&E Television Networks, 07 Aug. 2015. Web. 01 July 2017.

[5] Chafkin, Max. "Uber's First Self-Driving Fleet Arrives in Pittsburgh This Month." *Bloomberg.com.* Bloomberg, 18 Aug. 2016. Web. 01 July 2017.

[6] "Machines replacing workers: a budget theme." *DurhamRegion.com.* N.p., 19 Mar. 2017. Web. 01 July 2017.

DISCUSSION

i. Sizing the Impact

A study was conducted by Frey and Osborne (2013)[7], professors at the University of Oxford specializing in Technology and Employment, was inspired by well known British economist John Keynes. The authors attempted to classify occupations in the US with respect to the risk of susceptibility to automation by asking experts about the technological potential for automation in the near future. The study then concludes by suggesting a staggering 47% of all persons employed in the US are currently employed in fields that could be performed by computers and algorithms within the next 10 to 20 years. That initial paper sparked follow-up studies, applying risk of automation at the level of occupations to other countries. Consequently, cross-country differences in the estimated share of workers that are prone to automation are driven by similar occupational structure only. With this approach, Pajarinen and Rouvinen (2014)[8] estimate the share of jobs that are susceptible to automation to be around 35% in Finland while German researchers Brzeski and Burk (2015)[9] doing their own national study put their share of jobs at risk of automation to be as high as 59%. Bowles (2014)[10] found that fields risking automation in Europe range between 45 to more than 60%, with southern European workforces facing the highest exposure to a potential automation.

Although the numbers seem large, it is important to acknowledge certain critics that argue against these figures. Some oppose that an occupation is composed of bundles of task and even if some of those tasks may be automated, the entire occupation cannot. As such, occupations will slightly evolve and change form to still accommodate human workers[11]. They argue that given the managerial along with human interaction task of an occupation, that part would be hard to automate. While that is true, it can also be said that companies can reevaluate if those certain tasks are even needed if most of the other tasks of the occupation can be

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7 Carl Benedikt Frey & Michael A. Osborne (2013-09-17). "The future of employment: how susceptible are jobs to computerisation" (PDF). *Oxford University, Oxford Martin School*. 01 July 2017.

8 **Pajarinen**, Mika & **Rouvinen**, Petri (13.1.**2014**)

9 Digitalization and structural labour market problems - ILO Brzeski and Burk,2015; Dengler and Matthes, 2015; Lorenz et al., 2015).

10 The computerisation of European jobs | Bruegel Jeremy **Bowles** Date: July 24, **2014**

11 Arntz, M., T. Gregory and U. Zierahn (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", *OECD Social, Employment and Migration Working Papers*, No. 189, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jlz9h56dvq7-en

automated. All in all though it can be agreed that automation will have a measurable blow to employment rate, no matter how big or small.

Briefly comparing automation with the Industrial Revolution and, like previously mentioned focusing on the similarities, both result in job losses to the workers. With automation, however, the sheer volume of jobs at risk are a lot higher. This is due to the number of industries effected is a lot more variant whereas in the Industrial Revolution, the textile industry was the worst hit. In modern day, industries such as transportation, retail, healthcare, finance and a lot more will all be affected. Backlash from the people, along with government intervention, will be expected.

ii. Historical and Expected Contemporary Responses

Learning from history, extrapolations can be made as to how contemporary society may respond to technological advancement. The past has shown that in the wake of rising machinery employed in the textile industry during the Industrial Revolution in Britain, protests were orchestrated in hopes to keep their jobs. One of first organized protests due to new machinery being introduced had took place in Nottinghamshire on March 11, 1811. This sparked protests in nearby villages which set forth a type of chain reaction. This led to protests beginning all over northern England. Occasionally, fires were set to factories but in most cases, the protestors targeted only the machines. In Yorkshire, large sledgehammers nicknamed 'Great Enoch' were used to smash several machines. Some of the protests did become violent. In April 1812, in an incident near Manchester, a mill owner instructed his men to shoot into a crowd of 2,000 protesters. Three protesters were killed, 18 were wounded, and British troops killed five additional protesters the next day.[12]

Interestingly enough, similar situations can be seen arising in today's society as well. Google has reported its corporate buses are prone to being vandalized. This is because Bay Area protestors are upset with rising housing prices and tech companies' expanding automation efforts in the local community, quoted as saying "Anthony Levandowski is building an unconscionable world of surveillance, control and automation." The activists objected to Google's role in creating military robots, so they followed Levandowski to his Berkeley home to publicly try to shame him. In Paris last year, taxi drivers assaulted Uber drivers and passengers. They slashed tires and broke windows in protest of the startup stealing clients from the hard-

12 Lively, Amy. "Luddites during the Industrial Revolution." *Study.com*. Web. http://study.com/academy/lesson/luddites-during-the-industrial-revolution-definition-lesson-quiz.html 02 July 2017

working taxi chauffeurs. Additionally, Amazon was protested last year by employees demanding fair labor treatment. The protestors wore stickers emblazoned with their message in front of Amazon.com headquarters: “We are people! Not Robots!”[13]

The government, at which point, would be forced to intervene as it had done so in the past before. Social safety nets were employed though not directly in response to the machinery in the textile industry. Rather, they were there to curb the poverty; that poverty itself caused by the advances in machinery with the Industrial Revolution. Similar parallels are drawn here where the White House is drawing up measures to combat automation, or at least allow it to transition in more slowly. A report which is a combined effort by the Council of Economic Advisers, the National Economic Council, the Domestic Policy Council, the Office of Science and Technology Policy, and the Chief Technology Officer, says that further automation is not only going to continue, but advances in artificial intelligence (AI) make it likely that it will accelerate in coming years[14]. One such action, the report calls for, to ease society with the rise of automation is implementing a strong policy response to assure that workers are able to share in the economic growth that results from increased automation. That would include strengthening the social safety net and empowering labor unions in negotiations with employers. Which again is extremely reminiscent to what had happened in the past. And although these forms of measure might seem to keep automation at bay, hoping to stunt it, in the long term future where even smarter, artificial intelligence based automation takes off, a better resolution will be sought.

ii. An Eventual Need for Universal Basic Income (UIB)

At a certain point, once the inevitably march of technological advancement can no longer be denied and automation takes off in a multitude of industries to the scale at which not seen before in human history, a solution to lack of human work would be needed. Capitalism cannot thrive on a low paid or worse, a jobless mass population. That level of society may be half a century or more away but it is important to start thinking about the situation so constructs can be in place. One such construct could be an expansion of the welfare system that many countries employ today into a universal basic income. Since industries will have their wage cost nullified by sophisticated automation, some form of increased taxation must be imposed to fund such a universal income. Bill Gates has quite an interesting stance on the

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[13] Hartigan, Matt. "Today's Anti-Tech Protests Are Nothing New." *Fast Company*. Fast Company, 28 Jan. 2014. Web. 02 July 2017.

[14] Garver, Rob. "Here's how the White House trying to stop automation from decimating the the labor market." *Business Insider*. Business Insider, 21 Dec. 2016. Web. 02 July 2017.

situation where he says “The robot that takes your job should pay taxes”[15]. By adopting this sort of approach, where the companies no longer have to pay for wages of the workers but instead partly pay taxes on their increased profits or taxes on their ‘pseudo-workers’, that could fuel and fund the cost towards UIB.

An alternative train of though is whether or not adopting a UIB is even the correct course of action. Some argue that if an individual is being paid to do nothing, they will indeed continue to do nothing. They may indulge in vices like alcohol and drugs with their needs taken care of, having that large of a safety net. However Abraham Maslow, an American psychologist, argues that there is a pyramid of hierarchal needs[16]. With the first two layers taken care of, it promotes self-actualization of a human being where they seek to do more than simply nothing. With all of a nations fundamental needs met, it enables the population to do more. This has also been seen in the past as well once a level of needs are met for the population, thinking and philosophy begins to take route and flourish, causing civilization to take a new step forward into the future.

Conclusion

Civilization today stands near the dawn of a transition towards technological unemployment. This concept is not entirely new as similar transitions had happened in the past most notably in the Industrial Revolution. The three main ideas that came out of that period was the loss or shifting of jobs, protests leading to government intervention and ideas on having secured wages. These concepts are bound to be revisited once more as a new shift in technological advancement takes place in contemporary society. Whether this shift will come in 20, 40, 60 years or if the percentage of job losses are as great, with a long enough timeline there will inevitably be a fundamental change in employment. This employment shift may not be like ones experienced in the past where more jobs are created, or at least to the same extent of new job creation. Instead, solutions such as UIB must be taken into consideration. The guaranteed fundamental safety and needs being satisfied of the population may spur a completely new schools of thought and philosophy where more men and women are able to self actualize and realize there may be more to living than pay check to pay check.

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[15] Delaney, Kevin J. "The robot that takes your job should pay taxes, says Bill Gates." *Quartz*. Quartz, 17 Feb. 2017. Web. 02 July 2017.

[16] McLeod, Saul. "Maslow's Hierarchy of Needs." *Simply Psychology*. N.p., 16 Sept. 2016. Web. 02 July 2017.

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Thanks for a great short but memorable term! I really enjoyed this class format and I believe it will seep into memory deeper whereas with most of my other classes I tend to forget what we learn, especially when they're options. You may have seen this video but I thought you'd enjoy it, have an awesome summer!

https://www.youtube.com/watch?v=7Pq-S557XQU