

**Robotics & Automation Are Killing Jobs**

**A Roadmap for the Future is Needed**

**By Paul Conn**

The election of Donald Trump was driven by very real concerns over job opportunities for those living outside the big cities and in smaller communities of America. Towns that have been decimated by the loss of manufacturing, textile, steel, coal, and furniture making jobs over the past two decades voted overwhelmingly for the Republican candidate. Trump promised to bring back those jobs by renegotiating trade deals, using tariffs, and using other tools to keep US companies from moving jobs overseas.

But there was little to no mention of the driving force behind job losses in these industries: automation and robotics. In the face of a “third industrial revolution”, political and business leaders will need to develop policies to take on this growing problem. We will talk about the history of automation, the debate surrounding increased automation, the current state of production technology, and how this will affect the labor force and the overall economy. Lastly, we’ll talk about potential solutions that business and political leaders will have to agree on to meet the challenges of a future with high rates of long term unemployment.

“For more than a century, the conventional wisdom has been that new technologies boost productivity, lower the costs of production, and increase the supply of cheap goods, which, in turn, stimulates purchasing power, expands markets, and generates more jobs.” The United States, and all industrial nations, have worked off this rationale since the late 1800s. The increased use of technology and exponential growth in production is what created the high standard of living and wealth in America (Rifkin 15).

Beyond new mechanical technology that made workers more productive, automation began to take hold in the 1950s. The word automation itself was coined in 1946 and refers to “the application of machines to tasks once performed by human beings or, increasingly, to tasks that would otherwise be impossible” (Britannica.com). Automation evolved from the mechanization of labor during the Industrial Revolution. At first this term was applied to the auto industry where machines worked with parts in the metalworking process. Automation was given broader meaning by Norber Wiener, a mathematician who wrote a book called *Cybernetics*. In this book, he talked about how computers could be used for automation in manufacturing. Interestingly, it was Wiener who first warned that automating machinery would lead to mass unemployment. With the development of the computer in the 1950s, automation could be more sophisticated and centrally controlled. Robots soon followed in the 1960s (Rifkin 84,85).

Believe it or not, robots have been around a lot longer than many think. There is evidence of automated tools and toys as far back as ancient Greece and Rome! In the 20<sup>th</sup> century, a Louisvillian named George Devol designed a robotic arm that was used to transport die castings at General Motors automobile plant in 1961 (thomasnet.com). In the 1980s, robots became commonplace in automobile manufacturing. Today, they are everywhere - performing tasks from cleaning your living room floor to exploring the outer reaches of space. But as technology and Artificial Intelligence(A.I.) become faster and more advanced, robots become smarter, cheaper and able to do once inconceivable

jobs. Combined with automated processes, robots are now faster, stronger and cheaper than their human competition in most scenarios.

This growing ability to compete for work that people once thought of as ‘science fiction’ is what worries many economists, business leaders, and politicians. What you may find surprising is that this debate has been going on since the 1800s. In his 1867 book *Capital*, Karl Marx predicted that “increasing automation of production would eventually eliminate the worker altogether” (Rifkin 16). In 1925, the Senate held hearings to discuss the increasing number of workers being displaced by productivity gains in the 1920s. The committee found that most of these workers who lost their jobs because of these gains remained unemployed for a very long time (18). A 1964 report dubbed the ‘Triple Revolution’ report discussed revolutionary forces that would affect the nation now and in the future. Two of the forces – nuclear weapons and the civil rights movement – were commonly talked about and felt throughout society at the time. The third revolution, “cybernation” (automation), was not yet being felt in this golden era of job and wage growth in the economy. Yet this report thought the consequences of this automation such a threat that it devoted the bulk of its report to it (Ford 30).

The report initially was featured in the New York Times and other publications, but with little evidence of such job losses, it was soon pushed aside. After all, unemployment at the time was 3.5%, well below the natural rate of 5% unemployment (Ford 31).

As there were at the time of that reports publication, many business leaders and economists are not yet convinced this explosion in automation, robotics and artificial intelligence will result in massive unemployment. In a recent *Wired* magazine article discussing technology trends and the future of the World, President Obama had this to say about A.I. “I tend to be on the optimistic side – historically we’ve absorbed new technologies, and people find that new jobs are created, they migrate, and our standards of living generally go up.” Others point to past technological revolutions, such as when the automobile put the horse and buggy industry out of business. The auto revolution created entire new industries from mechanics and auto part suppliers to car washes.

According to an article on CNBC’s website titled “Don’t Fear the Robots, Tech Creates Jobs”, they say “data compiled by management consultants Deloitte from the census data for England and Wales stretching back to 1871 suggest that the growth of jobs in the creative, care, tech and business service industries have more than offset the loss of jobs in the agricultural and manufacturing sectors.” In the late 1990s, we also saw entire new industries in IT, Internet Marketing, web design and e-commerce that created millions of jobs. So, there is historical evidence that job losses can be mitigated when one technology usurps another.

Another shared viewpoint is that robots and Artificial Intelligence will simply make our jobs easier by allowing workers to “work smarter”. Other companies say they want to enhance humans, not replace them. “Our goal with AI is not to make super humans, it’s to make humans super,” says Paul Daugherty, CTO of software company

Accenture. He talks about a manufacturing company that is working to combine AI with an augmented reality headset to teach low-skilled workers new jobs. This allows the company to distribute workers across a variety of tasks with more cost-effective training. Another way A.I. is making humans “work smarter” is through software that can make unstructured data usable and actionable for sales teams. Sales teams can’t possibly keep up with all the data points that have an impact on individual sales, but machines can. These machines can mine through all this data and return relevant information that in the past would be unattainable (techcrunch.com).

While history does suggest that new jobs and industries spring up from technological advancements, the wide range of industries and jobs that may be negatively impacted makes it different than any other prior revolution. A 2013 Oxford study estimated that up to 47% of current jobs in the U.S. could be lost due to automation (Frey 1). In writer Martin Ford’s *Rise of the Robots: Technology and the Threat of a Jobless Future*, he gave us a few examples of these job-killing advances.

A San Francisco company has created a burger making robot that can churn out 360 custom made to order burgers an hour, with all the fixings you could imagine. McDonalds alone employs some 1.8 million workers worldwide (Ford 13). The protests over a \$15 an hour livable wage will only hasten the implementation of these machines.

The Kroger Company has invested in highly automated distribution warehouses, which now require very little human interaction. These robots can sort pallets to allow for

optimal stocking of shelves. The only humans needed are for loading and unloading the pallets from the trucks. Kroger currently employs around 431,000 workers (Ford 17).

Redbox, the quirky movie and game rental kiosk company, is fully automated to limit the need for human workers. Their Chicago region employs only seven people to service the entire area. Blockbuster video would employ seven workers for each of their dozen or so stores in the Chicago area before they went bankrupt. Blockbuster employed as many 60,000 people (Ford 18,19).

Agriculture is one of the last industries that have escaped automation induced job losses due to the need for humans to pick delicate fruits and vegetables. But even this industry is undergoing changes. Robotics companies here in the U.S. have developed machines that can harvest delicate strawberries, almonds, and oranges – all of which are labor intensive operations (Ford 23-25).

This is just a small sample of the technological advancements that will affect the labor market. Other affected fields include: legal secretaries, delivery drivers, taxi/Uber drivers, project managers, IT administrators, researchers, travel agents, office administrators and so many more. There seems to be very few industries that will not be affected from this revolution. Beyond raw jobs, other affects from automation and robots are evident.

These effects can be seen by the lack of wage growth, increases in income inequality, and the new part-time 'gig' economy. Job growth has been concentrated in low-paying service jobs for decades now. Real wage growth peaked in 1973. While other

factors such as the fall of unions, politics, and globalization have had some impact, the increase in productivity defies the economic theory that when productivity rises, wages follow. This trend held until 1973 when wages began to fall behind productivity gains (Ford 34-37).

Eventually, the loss of jobs, wage growth, and rise in income inequality, will have a very real effect on demand. These machines are not consumers. The loss of jobs and income will eventually result in reduced demand for anything but the necessities of life. Without demand, the consumer driven market will come to a halt, which will result in even more job losses (Ford 196,197).

With the threat of massive unemployment becoming more real with every new technological advance, is there anything we can do to mitigate this future? What are our options? Going back to the Triple Revolution report on automation referenced earlier, the committee who wrote the report “went on to propose a radical solution for this problem: the eventual implementation of a guaranteed minimum income made possible by the economy of abundance such widespread automation could create...and would take the place of...welfare measures” (Ford 30).

A different approach to the guaranteed minimum income idea involves paying people a social wage for community service or work performed at a non-profit. Proponents for a social wage included liberal economists Robert Theobald and Robert Heilbroner. Theobald argued that since automation would continue to replace workers, “it was necessary to break the traditional relationship between income and work” (Rifkin

256-260). Conservative economist Milton Friedman gave this idea a political boost when he offered a similar plan that involved a negative income tax. Friedman was less concerned with job losses from automation, but believed that a guaranteed income for the poor would be more efficient than costly bureaucratic welfare programs (261). A guaranteed minimum income may be controversial now but could be an absolute necessity if a large portion of the labor force are unable to find enough work to meet their basic needs.

Another solution discussed is to have ‘shared’ employment where two or more people work the same job that one person does now. A full-time job could be 20 or 25 hours a week. This idea goes back to the Great Depression when unions proposed implementing a 30-hour work week so that more people could find employment (Rifkin 26). In 1993, Volkswagen announced it would adopt a four-day, 32-hour workweek as an alternative to mass permanent layoffs (224). So this is another solution with some merit.

While these solutions are a great start, more innovative thinking and smart governing needs to happen now. As the election has taught us, many in this country are hurting from the economic hardship resulting from this latest tech revolution and looking for solutions. Within my kids’ lifetime they may be face-to-face with the realities of stagnant or declining wages. They may be included in the growing segment of the workforce unable to find jobs or get the proper training needed to have a chance at one of the remaining jobs left. Their lives may be threatened by social unrest.

The U.S. and global economies are at a crossroads. A roadmap for the future is needed quickly. Decades of technological advancements in computers, robotics, automation, software programming, and artificial intelligence has led to unprecedented productivity gains at the expense of the working class in the steel, coal, manufacturing, automobile, and warehouse industries, to name a few. This has hollowed out the middle class. Years of stagnant wages for those who still have a good job and terrible prospects for those looking for one should frighten policymakers. Political, business, and civic leaders must acknowledge this threat and work together to find viable solutions like a universal income policy or a social income that will continue to put people's economic well-being in front of a mad dash for money and progress at all costs that we see today.

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