Sai Gatram

Jennifer Kraemer

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Automation and Computer Science

Today, a Luddite is considered to be a person who is opposed to new technology. However, during the Industrial Revolution, the Luddites were a group of textile workers who opposed labor-replacing machinery. Their hatred of the automation of the textile business became so immense that the luddites “challenged the Industrial Revolution by roaming the countryside smashing machinery and burning factories.”(Davis 278) For the Luddites, automation was just another mechanism that would take their jobs. Automation in its essence, is a way to self-regulate production. It is described as a, “work process which includes computer information processing for decision-making and information feedback and control systems.”(Davis, 279) It plays a huge role in all aspects of everyday life, and because of this, it is a major aspect of the computer science field. Since automation is a process that can mechanize lines of assembly workers- with some hardware and some software- computer science plays a large part in this development. Consequently, because automation can replace many workers at once, the ethics of the process is always up for debate. While automation is a carrier of progression, many people are opposed to vast rewards that automation brings because of automation’s temporary drawbacks. I argue that the advantages of automation, which include increased productivity and intelligence of the workforce, far outweigh the brief shortcomings that automation brings along with it.

Similarly, in an increasingly automated world, efficiency is at an all-time high. It is this efficiency that makes automation so sought after. Even with the minor drawbacks the automation brings, the increase in productivity is appealing to every industries. According to Davis, “industrialization has proved itself so successful that it is sought by nearly all countries as an almost universal goal.”(278) Even though the idea of automating tasks came during the industrial revolution, the real results of automation and the miracles that it can perform came to light during the Second World War. During World War Two, many devices were created in order perform tasks - that would take a typical worker hours - in minutes. Essentially the rise of automation came when, “devices became available which could replace men in doing certain highly repetitive or dangerous tasks, and in accomplishing these tasks very quickly.”(Cunningham, 74) After the War was finished, this equipment was modified and applied to business and industries across the nation. Seventy years later, automation plays an even larger role in society. It has reached almost every industry and has changed everything from percentage yield to worker happiness.

Specifically, for the computer science field, automation has not only added many jobs, but also has made the testing process more efficient. Automation is a major requirement for the quality assurance sector because of the chore that is manual testing. Imagine having to test for exceptions and errors for multiple thousands lines of code. This is why automation plays such a large role in the computer science field. However, in addition to making the most routine tasks more bearable, properly implemented automation makes the tasks more accurate and cost effective. In contrast to popular belief, automated testing is not automatic testing. This means that there will never be the same code that would test two different projects. Ultimately, even automated testing programs have to be molded into the project that they will test. However, if this is properly executed, the results are extraordinary. According to Graham and Fewster, automated tests, “ help to ensure quality”, “find serious defects”, “can be executed in many environments”, and “can be scheduled when desired.” (126) More than ever though, “Automated test is popular, and testers, developers, production team, and business team are happy with this test.” (Graham and Fewster 127) For programmers, automating the testing process is a lot harder to implement because of the various testing structures that have to be implemented. However when properly implemented, the results are clearly beneficial. For other industries that require much less change to the automation process, imagine the increase in work done. The automation process is slowly sweeping industries replacing repetitive time-consuming tasks with efficient and cost-effective preset tasks.

While in the Computer Science field, automation creates many tasks that ease the load off of programmers, programmers are the ones that help the automation process. While automation is clearly beneficial, like any innovation, a few minor consequences come out of it. As Chatfield would say, “An inverted miracle… When you invent the ship, you also invent the shipwreck.” One of the biggest problems faced is ethics behind the automation process. The ethics of automation is an important factor to consider for the programmers because the programmers play a vital role in the automation process. Since programmers are essentially writing a specific set of code that will replace a human, this issue has come up many times. However, when looking at the positive effects of automation this point becomes moot. This is because automation has very positive long term effects on standard of living. Automation is used as a tool, “to make tomorrow’s worst better than today’s.”(Chatfield) With these benefits that help society change for a better tomorrow, automation seems to have no downfalls at all. The rapid increase in automation is making the world a better place for society as we know it.

The Luddites would see the rapid increase of automation in modern society a way to bring crippling unemployment to the economy. Furthermore, the Luddite’s theory would state that unemployment would steadily rise as tasks become more and more automated. However, even with the rapid growth in automation, the unemployment rate seems to float around a steady number. This is because the jobs that are replaced by automation, are quickly replaced by jobs that automation forces industries to have. In an increasingly mechanized industry, the physical work can be done by machines. These machines are not perfect and are prone to defects and breaking. In addition, fully mechanized factories are still a long shot for many processes. This is why supervisors and mechanics are employed. The supervisors, “provides the necessary feedback link between the end product and the machine itself.” (Cunningham 75) The supervisors oversee the tasks that the machines do and then they complete the whole process, all the while ensuring a certain level of quality. The mechanics adjust the machines and correct any mistakes that it makes. This trade overall makes up for the workers that are being replaced by machines. However, this doesn’t mean that automation does not create change. With the advent of a more mechanized production line, automation is forcing economies to adapt. Since many of the production needs are being met by automation, economies are adapting to more support based economies. According to Cowen, “the economic theory of comparative advantage suggests that even unskilled workers can gain from selling their services.” While the economies are changing to the technology that is evolving around them, one thing remains the same; the idea that human wants and needs can never be fully met. The idea that humans never fully have their wants met shows how automation cannot really cause unemployment. Automation as Davis would say, “will serve man by accelerating the satisfaction of his needs.” Fundamentally, automation forces economies and the workers it employs, to adapt. It causes, the economies to be more support oriented, and the workers to be management oriented.

With entire economies adapting to the introduction of automation, these changes have a considerable effect on the industry workers. Automation lets man fulfill their true potential by replacing the time they would have spent doing physical labors with time that can be spent on productive activities. Consequently, since automation decreases the amount of menial physical tasks and puts a focus on management, it creates a demand for educated individuals. This creates a more educated workforce. Since automating a process is no simple task, it requires a lot of teamwork. This teamwork is crucial because every stage of the process needs to be properly automated for it to be implemented correctly. According to Graham and Fewster, “because everyone on our team was committed to automating all the regression tests, we had a lot of skill sets and viewpoints to help tackle the automation problems.”(30) This shows how automation effects the computer science field. Automation’s effect on other industries are very similar; according to Davis, “automation tends to present a more direct need for teamwork and a more direct reward.” (280)On a whole, automation makes the industries smarter and efficient, while promoting good work ethic. While the process is very complicated, the results far outweigh the time and effort put into it.

The automation procedure is a very complicated process as it forces multiple parts of a process to work together. For a programmer, this means multiple inputs that all need to be compiled to a general system. While automation does cause temporary unemployment of workers, the benefits of automation are too big to not consider. Those who get unemployed, are replaced by mangers who run the general process and mechanics who have to keep the machines working well. For the workforce, automation creates a smarter working class. For the employers, it saves money and make the process more efficient and less problematic. For the Luddites, they wrongly viewed it as a carrier of unemployment, rather than the wonder that it is. For society, it is a technological advancement that can change the way industries work forever.

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