Automation: Streamlining Development Operations

(Technical Paper)

Impact of Automation and Machines on employment

(STS Paper)

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Prospectus

General Research Problem

What has been the impact of automation and machines on employment?

Automating tasks or systems has been around for a while that whenever possible, it would be much simpler to let machines perform repetitive, tedious tasks without human interference. Automation was first introduced and coined in the automobile industry around about 1946 to describe the increased use of automatic devices and controls in mechanized production lines. The word originated and is attributed to D.S. Harder, an engineering manager at the Ford Motor Company at the time (Groover, 2020). Down the line, automation has slowly been introduced in other fields such as software production specifically through the use of automated scripts in software testing. Automation has played a vast role in many events in our society. Specifically, to businesses with relation to economics, automation has been a technological advancement by eliminating the need for human labor.

Having machines do the work for us has allowed us from relying on humans to get a task done allowing businesses to cut costs. The invention or discovery of automation has forced many people out of employment because there is no more job security in many industries such as retail, customer service, and food/car production. The notion of automating processes has been a technological invention that has influenced and will continue to influence the future. It is vital to understand the effects it has had or may have had in our society. As a result of a successful internship that involved some exposure to automating processes that were once manual, I would like to examine the positives and negative impacts of automation on employment.

Technical Abstract

To satisfy the undergraduate Bachelor of Science in Computer Science degree requirement, I will not be taking part in the Technical Capstone Project but will highlight a technical computing experience/internship.

During the Summer of 2021, I took part in an 8-week virtual internship opportunity at Deloitte within their Global Technology Services (GTS) business unit. I worked specifically in the Global Technology Infrastructure (GTI) business line alongside the Platforms Automation team as an Automation Developer intern. The guiding principle for this team was to embrace the evolution of the workplace by driving the increased adoption of automation. As an intern on this team, I became involved with three projects dealing with Application Programming Interface (API) Development, Server Compliance Automation, and Promoting Sustainability.

On the API side of things, the objectives included learning the life cycle process of an API. I learned how to integrate and test to ensure the API software requirements were satisfied. I utilized the MuleSoft integration platform to help increase efficiency in workplace automation. The deliverables for this API project included the creation of two APIs for other Deloitte technology platforms teams such as the performance engineering, reliability engineering, and database engineering teams to utilize. On the Server Compliance Automation side, the objectives included learning to analyze a Center for Internet Security (CIS) Benchmark and understanding the security flow processes required to protect servers. I utilized technologies such as the Chef Services Platform to harden Deloitte servers and ensure server compliance. The deliverables for this second project included the creation of a server requirements document to create the needed software controls to ensure those requirements were satisfied.

Towards the end of this learning event, I teamed up with other Deloitte GTS interns to develop a roadmap on ways organizations such as Deloitte could positively impact climate change and sustainability efforts by external stakeholders. On this team of interns or innovation challenge, I collaborated with others from various technical backgrounds to address a significant problem that impacts the lives of all those on our planet. During my time, I helped ensure the efficient and resilient state of technology and infrastructure at Deloitte. The significance of these projects was to continue Deloitte's efforts to innovation and evolution by helping ease redundant processes through the introduction of automation.

STS Approach

In answering the research problem at hand, I will utilize and incorporate several STS methodologies. To begin, I will take a more Historical and Philosophical approach. I will focus on finding, reading, and synthesizing previous literature to help understand the innovation and evolution behind automation. Diving deeper into the history of automation will allow me to gather evidence of times automation was seen as a success, a failure, or a detriment. By focusing on the historical significance, I want to establish connections around automation within these pieces of literature to highlight a common theme. Automation is a widely used algorithmic approach to solve many problems and it is important to understand the societal and historical significance it has had.

The second methodology I want to utilize is the trace connections of relation approach. Using this method, I want to place emphasis on similarly automated jobs along with the algorithms that determine how these roles are to be automated. Automation is vital especially in the manufacturing industry and but by using this approach, I look to compare the use of automation and differing views people around the world have on the topic. Lastly, I want

especially take advantage of the case study approach. The case study method will help me pinpoint and dive more into specific examples or scenarios of automation throughout time that have led to significant impact.

The study looks at how companies outsource duties such as resume screening to automated Artificial Intelligence programs. Programs like these are used to replace humans and fill job vacancies. These programs are used to pre-screen candidates and helps manage the application processes. The study was done by the Harvard Business School along with the consulting firm Accenture. The purpose of this study was to help contextualize the job market post-covid19 to understand factors affecting employment. In their findings, they found "that 99% of Fortune 500 companies use an ATS [an Applicant Tracking System is designed to identify a limited number of candidates who most closely match specified criteria for a given position].Our employer survey confirmed that even midsize enterprises—those with between 50 and 999 employees—use such filtering technology quite extensively" (Fuller et al., 2021). Because of the use of this automated system to find talent, "an enormous and growing group of people are unemployed or underemployed, eager to get a job or increase their working hours. However, they remain effectively 'hidden'[willing and able to work full-time if given an opportunity] from most businesses that would benefit from hiring them by the very processes those companies use to find talent" (Fuller et al., 2021).

By utilizing these three methods or research approaches, I think I will be able to completely answer my research question on all bases.

Relevant Literature:

To describe some of the reasons why automation is even considered, and the role machines play in automating human jobs I will reference Karl Marx's piece *Capital*. Marx believes "Like every other instrument for increasing the productivity of labour, machinery is intended to cheapen commodities and, by shortening the part of the working day in which the worker works for himself, to lengthen the other part, the part he gives to the capitalist for nothing. The machine is a means for producing surplus-value" (Marx, 1977). This piece is important and helps give an understanding of why automating a certain task is effective from the views of a capitalist. Marx in this piece discusses why machines being used in production is more efficient than using humans.

Another important piece I will utilize is Cathy O'Neil's *Weapons of Math Destruction*. In her book, the book references how some algorithms can be somewhat racist. Using these examples, I want to try to make a connection regarding how automation has now been introduced in the hiring stage of jobs especially when companies want to weed out candidates. O'Neil writes this underscores another common feature of WMDs [weapons of math destruction]. They tend to punish the poor. This is, in part, because they are engineered to evaluate large numbers of people. They specialize in bulk, and they're cheap. That's part of their appeal. The wealthy, by contrast, often benefit from personal input. A white-shoe law firm or an exclusive prep school will lean far more on recommendations and face-to-face interviews than will a fast-food chain or a cash-strapped urban school district. The privileged, we'll see time and again, are processed more by people, the masses by machines" (O'Neil, 2016). Using these connections, I want to discuss some of the major downfalls in automating a task.

Matt Vidal writes, in a piece titled *Contradictions of the Labour Process, Worker Empowerment and Capitalist Inefficiency*: "I agree with criticisms of these utopian visions

[workers are unproblematically empowered, contradictions resolved, and mutual gains realised], which are inconsistent with the diversity of employment arrangements in advanced capitalism, including declining employment security, increased work intensification and rising inequality" (Vidal, 2019). Vidal describes the impact of automation had on jobs by discussing specifics regarding the invention of the assembly line. In this piece, Vidal mentions the Fordism and Post-Fordism along with the societal impacts they had.

References

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