Thesis Project Portfolio

Improving Manufacturing through the Automation of Report Generation

(Technical Report)

The Automation of Business Processes and its Effect on Overall Business Structure and the Hiring Process

(STS Research Paper)

An Undergraduate Thesis

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Executive Summary

Introduction

My STS research paper was very heavily inspired by my work for my Capstone project. My Capstone project was the creation of an automatic report generating application that was done during my internship the summer before my 4th year. My STS research paper focuses on the effect that automation has on business processes and the hiring process. Both of these projects are based in using technology to automate processes that were formerly done manually.

Summary of Capstone

The summer before my fourth year, I interned in a small manufacturing company. One of the managers would manually search for and copy data using an ERP software to generate reports. This process was done daily and would take up to an hour to complete depending on the type of report and amount of data needed. In an attempt to decrease the amount of time and effort needed on a daily basis to complete this process, I created an application that automatically pulls data from a database and generates reports. This was done using SQL Server Management Studio (SSMS) which allowed me to use "tasks" to pull and format the data from the database into usable tables every hour. After that, I developed a Django web application that pulled from the preformatted tables and automatically populated the selected report. As a result of my project, the manager was able to instantaneously create reports by accessing the application and selecting the desired specifications. The creation of this application decreased the amount of time required to create the reports from up to an hour to a few minutes.

Summary of STS Research Paper

During the Summer of 2023, I took part in a 10-week internship opportunity at Titan Display. I worked creating an application that would automate the process of generating reports.

Automation is becoming highly proficient, and for this reason, many people have started worrying more about how automation will affect them and their livelihood. Although automation brings efficiency and effectiveness to an engineering environment, it is expected that automation will bring its share of harm to people and society. Because of my internship experience, I chose to highlight the impact automation has had on businesses. The research problem I look to answer is how does the automation of business processes affect overall business structure and the hiring process? To address this question, I have elected to use Hughes (1987) theory of *technological momentum*. I expect to find that automation has caused companies to hire fewer laborers in mundane fields that can be done via automation and has hired more skilled laborers that are capable of maintaining and expanding the automation process. This calls to question whether the automation which leads to more efficient work is ethically correct if it leaves many laborers without jobs.

Concluding Reflection

By working on both the Capstone Project and the STS Research Paper simultaneously I was able to understand both. Working on the Capstone I was able to create a tangible example of an automated process and see how it impacted the company I was working at. Doing the Research Paper provided context for how the impact of automation can be seen on a larger scale in a variety of industries and processes. The Research Paper allowed me to reflect on how my work over the summer was important and is part of a very common process of automation. By having experience with both, I have a greater understanding of automation and its impact and the work required to implement automation in the workplace.