Designing a New Automation System for Deleting Service Accounts

Analysis on Spotify's use of RPA Technology

A Thesis Prospectus

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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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Introduction

In the 21st century, technology has evolved very much to the point where the world itself has been very much automated. Automation is typically defined as the creation and application of modern technology to improve and enhance manual or technological aspects of living. Different modern industries have benefited immensely from these leaps in innovation including the manufacturing industry, the transportation industry, utilities such as water and gas, and many more. The United States government in fact recognizes the value of automation professionals and support for the importance of automation to industry comes from the United States Committee on Appropriations ("What is Automation?", 2023). In addition, many automation techniques have become common practice in the modern day such as artificial intelligence, machine learning, and RPA (Robot Process Automation) (Mercer, 2021).

Many companies have a system where hired employees have a personal account for the company where they can log in and have access to the company space where they can engage in work and communication assigned to them. Typically when employees either leave the company or are terminated, the accounts once associated with them must be deleted (Melnick, 2023) . This is usually done manually by other employees who are tasked with having the account deleted using the necessary information specific to that account. For my internship at Synopsys Inc. I was tasked with figuring out how to automate this process of deleting these accounts alongside the team I was assigned to. This task was to be done with certain programs that the company was familiar with alongside coding languages I had expertise in. Using a combination of programs that my team members taught me how to use and my programming experience I was able to build a working automation system that the company uses to this day. My automation system

removed a human element that once existed and controlled this system and replaced it to have more technological elements.

The technological momentum framework is defined as technology or more specifically a socio-technical system gaining momentum while the influence of society over the technology decreases; the technology's influence over society also increases. Earlier in the life of a technology, society has more power to shape the technology's design, purpose, meaning, and role while later after the technology has gained momentum it has more power to influence society's practices, values, power relations, and more (Hughes, 2021). This technological momentum could be seen with my internship at Synopsys Inc. with the way the influence in the company completely shifted from the manual deletion of accounts by human hands to an automatic deletion done through a computer process. However, this is just a smaller example of technological momentum and I would like to analyze a much larger case that also deals with the topic of automation. I would like to analyze using a technological momentum framework how over time new technology that Spotify has embraced has caused this shift in influence.

Spotify has been utilizing RPA (Robotic Process Automation) since 2017 ("Spotify Expands Commitment to Innovation and Automation Using UiPath") which has led to Spotify being run by many bots who automatically work the main functions of Spotify including recommendations and songs that are boosted to popular audiences. It has been proven numerous times through many studies that Spotify has power over which songs and artists gain popularity and can, to a degree, manipulate the music industry (Nwansi, 2021). I would like to analyze how this in conjunction with how Spotify uses the RPA technology has caused a massive shift in influence over time from society shaping the technology's design to technology shaping society to stay true to the technological momentum framework. In addition, I will apply the insights

found during my research to effectively analyze the project done during my internship at Synopsys Inc. and form connections to strengthen my analysis of both.

To effectively analyze automation and the effect it has on society from smaller systems to worldwide ones it is important to address the technological and social aspects of the issue. I will recount my experience at Synopsys Inc. and the project I successfully completed to give a firsthand example that I experienced as an example of a smaller system. Furthermore, I will apply a technological momentum framework to research done on Spotify and the automation technology it has implemented in the modern day to form an analysis on the shift in influence on society as a result of automation itself. The research on Spotify will also be an example of a much larger system affected by the technological momentum framework.

Technical Project Proposal

Synopsis Inc., an American electronic design automation company that focuses on silicon design, intellectual property, and software security, needed to automate the process of deleting accounts after employees left the company. Previously, certain employees had to do this completely manually and it cost the company much extra work and time that could have been spent on other avenues of the company. As described by the team I worked with, the manual process had to be done one by one for each account and this could take several hours in total just for one session. This led into my role in the internship which was to help with this issue. As an intern at Synopsys, I utilized a combination of different programs, including Python, SharePoint, Power Automate, and Azure Services to automate the account deletion process. Through my entire summer at the company I slowly made progress towards making this automatic system. Eventually, through much trial and error I was able to create a system that worked as intended. The company still utilizes the combination of programs I designed to this day, and they continue

to make improvements like making the time faster and doing multiple deletions at once. I would say that the main CS (Computer Science) courses that contributed to the skillset I used at the company were CS 1110 where I learned and enhanced my python skills and STS 1500 and STS 2500 where I learned about how technology and society intersect.

I would say that the main flaws in the courses that I took is that they did not prepare students for working in a company setting. While I had the python skills that were curated through the classes I took and the knowledge of society and how I should design my products I did not have the experience of how it feels to work a job. This internship was my first real job experience where I worked full time on strict hours every week day and I had to learn to adapt in the moment. I believe that improving and requiring certain CS classes to give experience akin to working at a company would be very beneficial to all students. Most students in the CS major are expected to follow a career path to working a technical job similar to mine and so if they had experience in either mock or volunteer experience they would be better prepared after college. In their current form, the CS major lacks a required class where students can get real world experience working with people in a company type setting. I will present a few ideas where CS courses can be improved to better students for an experience like mine.

One idea I have is that there should be a required class where students are forced to volunteer at a nearby company. While technical experience would certainly help, I am sure it is quite difficult to coordinate all students to do technical volunteer experience near the university. If it is possible it should be implemented but if not then any volunteer experience would help either way. This will give students a chance to experience a taste of being employed and working. Doing this will better prepare students so they are not surprised at the different skills they must practice such as communication, teamwork, punctuality, and more when they prepare

for future work. Another idea I have is that there should be a required class that prepares students for different responsibilities that come with being employed. Some examples of topics this class could teach are how a paycheck works, how tax forms work, what rights students have as an employee, and more. Both of these types of classes do not have to be specific to CS students as all students could benefit from them but as for my internship experience I know that if I had potential classes like these I would have had a much easier time adjusting to the work environment. The ideas I presented can be curated to be particular to CS classes and students and deal with topics and work that they would most likely have to work with.

I will draw upon research done on whether universities prepare students enough for employment and use that to enhance my proposal on how CS courses can be improved. I will look for research that specifically talks about students who are unprepared for working and what improvements can be made. I will use the concepts gathered from the research done to organize my argument and enhance my improvement proposals. In addition, I will provide evidence in the form of my internship experience and what I experienced firsthand. I will also use the current layout of current CS courses and what they currently lack. I can then compare them to courses taught elsewhere through my research to show the contrast and enhance my argument fully.

STS Project Proposal

Spotify is one of the most prominent music platforms in the world. It is a digital music, podcast, and video service that gives access to millions of songs and other content from creators all over the world. There are hundreds of millions of users that use this platform every day and it would be hard to find people that are unfamiliar with the platform. Spotify has origins that trace back to 2006 when two Swedish entrepreneurs Daniel Ek and Martin Lorentzon came up with

the idea for a music streaming service that would be easy to use and offer a wide variety of music. In 2008 Spotify launched in several European countries and had an overwhelmingly positive response (Murphy, 2023). Spotify in its earliest stages relied on manual processes and a more basic set of tools that needed much human influence. However, over time Spotify changed with the evolution of technology and started using automation techniques. This includes artificial intelligence, machine learning, deep learning, and of course RPA techniques (Kaput, 2022). I intend to analyze the way the technology has shifted at Spotify using a technological momentum framework and show how certain technologies have caused Spotify to have a larger influence on society then the initial influence society had on the service itself.

Technological momentum is founded on the principle of technological determinism which is described as technology gaining momentum over time and having influence on society much more than society having influence over the technology (Hallstrom, 2020). This technological determinism combined with social construction creates technological momentum (Colarossi, 2020). Currently, Spotify utilizes something called RPA (Robot Process Automation) technology. Ever since 2017, Spotify has experimented with this technology where they use automated bots to do many notable services such as curating playlists and recommended songs in Spotify. This is important to highlight due to removing a major human element in this process and slowly relying on the technology to shape these essential components. Spotify was initially built using common music file sharing technology at the time. This allowed one to search and play music that they desired but modern features such as data collection and predictive technologies were not present. This is to say that Spotify was initially built with much manual labor and over time automating technologies such as RPA have limited these manual processes and heightened the technological automatic processes.

The reason that people must be aware of this is because of the influence Spotify has on society itself. Spotify with its listening power has been proven many times to have the ability to push songs into mainstream society. Research done on the topic has proven that Spotify and the way their playlists work has influenced what songs are pushed to radios and to popularity. In addition, the way that streaming platforms suggest music to listeners has a major influence on their listening habits (Passy, 2023). Therefore, Spotify and the technologies it utilizes inadvertently influences society itself. If we as a society continue to ignore how this system works then there could be a time where all popular music is generated by technology itself. People would more or less be controlled as the music that is popular wouldn't even be chosen by people and would be forcefully pushed into popularity through exposure. Although Spotify was initially built as a way to browse all types of music that currently existed with the way that technology is heading and already headed, automation has gained much momentum and has led to the platform's effect on society becoming greater and greater over time.

To support my argument I will analyze evidence from a variety of sources. This will include articles from uipath ("Spotify Expands Commitment to Innovation and Automation Using UiPath") and other technology holders, podcasts from Spotify itself where they talk about RPA, and more. I will also do research on how Spotify affects popular music through its recommendation feature and its playlists. Research on both of these topics will strengthen my argument and using the technological framework I can show how automation has taken more influence on society over time. I will start with the early stages of the technology when humans had the most influence on the technology. During this stage people could shape how the platform worked and what the platform prioritized. I will then transition to the technology that prioritizes automation and automation techniques with a timeline of innovation. I will then connect this to

the influence that Spotify has on society in the modern day with the amount of people that use the application. This will also be conjoined with the research done on Spotify and its effect on what music is popular in society. The influence that Spotify has shapes what music will be played in society and what people will be drawn to. I will use all of these factors centered around the technological momentum framework to create my full argument.

Conclusion

For my technical project I am doing an analysis of my internship where I used automation technology to improve the systems at the company Synopsys Inc. I will form a full analysis of the technology I used and how I made permanent changes to the company. For my STS project I would analyze Spotify and how the technological influence has changed over time in a technological momentum framework. This technological momentum framework would be a combination of the RPA technology that Spotify uses currently alongside the influence Spotify has on what music becomes popular. The result of both the technical project and the STS project will set a standard for analyzing automation in the modern day and what the trajectory of it looks like for the future. Both aspects are necessary to show both analysis and technical progress in real time.

Word Count: 2535

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