

**Thesis Project Portfolio**

**Designing an Admin Dashboard for an Anti-Money Laundering Platform**

(Technical Report)

**A Broken System: Exploring the Failure of Technical Interviews in the Software Engineering Industry Using Technological Momentum**

(STS Research Paper)

An Undergraduate Thesis

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## **Sociotechnical Synthesis**

(Executive Summary)

### *Preventing Cybercrime By Designing Secure Applications and Hiring Qualified Applicants*

With the meteoric rise of the internet over the past few decades, cybercrime has become an increasingly prevalent issue that continues to plague our society. As technology continues to outpace governmental regulation and the internet continues to offer unprecedented anonymity, many criminals have taken advantage of this new digital era to exploit others for their own gain. Both of my projects explore ways in which companies can shield themselves from the risk posed by cybercriminals. For my technical project, I created an admin module for an anti-money laundering application that can detect and report suspected cases of money laundering at a major bank. For my STS project, I conducted an investigation of hiring practices in the software engineering industry using a technological momentum framework. My technical and STS projects both address the issue of a lack of cybersecurity throughout the tech sector and the need for more competent software engineers to combat cybercrime.

For my technical project, I participated in a software engineering internship at a financial institution in which I worked on an anti-money laundering team to develop an application that helps detect and protect against financial crimes. I worked to create and test an admin module in which administrative users could view and manage investigations on the application. In order to manage a complex platform that relies both on algorithms and investigators, I created an administrator dashboard that shows analytics and relevant information about investigators and investigations such as how many investigations have been completed in a certain time frame, how many investigations an investigator has completed in a certain time frame, how many transactions have been flagged, and other data that helps in managing the platform. Previously,

analytics for the platform needed to be generated manually and were only done so once a year because of the extensive work required. The admin dashboard I built alleviates the issue of manually generating analytics and reports regarding investigations by continuously and automatically generating live analytics on a dashboard that platform administrators can view and access at any time.

For my STS project, I explored the software engineering hiring process prevalent throughout the industry today which selects candidates for a job based on their ability to develop efficient algorithms during technical interviews. I researched many of the issues with the current system of technical interviews, such as how the prep industry surrounding software engineering technical interviews has turned the entire process into a matter of memorizing and regurgitating archaic algorithms. I then looked at the rise and fall of past interview styles in the industry such as the brainteaser interview. Finally, I used Thomas Hughes' framework of technological momentum to analyze the current state of technical interviews and predict their future fate. My research discovered that the rise and fall of interview styles are cyclical, with newer styles replacing old styles once the old style becomes too ingrained in the industry and reaches technological determinism, no longer serving any useful purpose. My research concluded that the best way forward is for companies to design their own interview styles to find candidates most suitable for them as opposed to copying whatever interview style Google or other trendy companies in the tech space are using.

By working on both projects at the same time, I was able to gain a deeper understanding of the cybersecurity issues that continue to plague the tech industry and their ethical implications. My technical project was focused on remedying existing issues by designing better applications whereas my STS project was more of an exploration of the long-term causes of

these issues and how they could potentially be remedied. Thinking about both the immediate technical fixes and the long-term societal issues allowed me to gain a deeper appreciation for the significance of my work. Finally, I came to the realization that in complex socio-technical systems with multiple moving parts and ethical dimensions, like the software engineering industry, there is never a single “silver bullet” solution to fix everything.