

**Thesis Project Portfolio**

**Docker: Version and Security Upgrades with Containerized Applications**  
(Technical Report)

**Crime is the Driving Factor of Cryptocurrency Adoption**  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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## **Sociotechnical Synthesis**

### Incentives, Cryptocurrency, and Nuclear War

70% of the United States' nuclear warheads are stored on submarines. My technical report focuses on my time at Progeny Systems upgrading software tools used to help develop secure communications with submarines and ensure nuclear devices are not compromised by malicious actors. While not every nation has nuclear weapons, all have a subset of citizens who feel that their government has too much influence over their lives and money. Proponents of cryptocurrencies argue that the anonymous transfers of money they allow protect users from the sprawling power of governments. My STS research focused on illuminating how variation in trust in government, among other factors, drives the disparate rate of cryptocurrency adoption among developed and developing nations.

My technical report focused on my experience as a software engineering intern at Progeny Systems where I worked on upgrading the company's continuous integration/continuous development tool and software analysis tool. My manager had wanted to upgrade them for over 5 years but had been denied the opportunity to assign employees to do so prior to my internship. I built the upgrades for these tools using Docker containers, which means they will automatically pull the most recent, stable, edition of their software from the internet. This future proofs both tools as they will never need to be manually updated again. My work made the software more secure, efficient (my upgrades to the software analysis tool led to an additional 55,000 lines of code being scanned), and saves future labor time associated with manually updating both software tools.

The deliverable of my STS research was a report that provides a greater understanding and insight into the reasons for the discrepancy in cryptocurrency adoption rates between

nations. My analysis included two underdeveloped countries, Vietnam and Nigeria, to help reduce the gap in the research of understanding why certain underdeveloped nations have higher rates of cryptocurrency adoption than developed nations. These nations were compared and contrasted against two developed countries, Norway and the United States to determine why there were such disparate adoption outcomes. My analysis concluded that inflation and avoiding government oversight for personal financial gain were the key reasons why citizens in less developed countries opted to adopt cryptocurrency. More developed nations experienced lower levels of crime which makes cryptocurrency, a tool for untraceable and anonymous money transfers, less appealing in those nations. The benefits that can be derived from this conclusion are that it helps provide an understanding of the problem and potentially can serve to highlight areas for legislators from these nations to target should they want to reduce or encourage the adoption of cryptocurrency.

My projects are fairly disjointed and unrelated at first glance. I think this ultimately served to enrich both by forcing me to think deeply about why people behave the way they do and specifically, see how the power of short-term financial incentives in shaping human decision-making compromises the long-term health of a group. As Haidt writes in *The Righteous Mind*, “Brains evaluate everything in terms of potential threat or benefit to the self, and then adjust behavior to get more of the good stuff and less of the bad.” At my internship, the security of the tools I upgraded was placed on the back burner for years because they were not profit centers for the company. As a result, they stagnated and thousands of lines of code remained unscanned, lowering the quality of the company's product. Similarly, the widespread adoption of cryptocurrency greatly hampers the government's ability to tax and fight money laundering. A government with no revenue cannot provide essential services to its citizens and rampant money

laundering empowers criminals to terrorize a society at a large scale. Despite the corrosive long-term effects of cryptocurrency adoption, many citizens opt to utilize cryptocurrency to lower their tax burden (for example, emigrants from sub-Saharan Africa avoid remittance taxes on income sent home to their families by using cryptocurrency). The consistency of brains to choose more of the 'good stuff' for individual gain that can hurt the group illustrate the importance of STS perspectives as a means of examining the holistic impact of incentives. My project ultimately showcases the flaws of the short term financially motivated decisions and the importance for people in positions of power to consider how these incentives may harm the long-term health of their company or country.