Thesis Project Portfolio

Streamlining Help Request Workflow with Slack Automation Tools

(Technical Report)

Anonymity's Influence on Cryptocurrency Criminal Behavior

(STS Research Paper)

An Undergraduate Thesis

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Executive Summary

The recent boom of cryptocurrency has exposed both the good and bad sides of these virtual currencies. Criminals tend to exploit some of the aspects of cryptocurrencies including anonymous transactions and security vulnerabilities in blockchains. My STS research focuses on how anonymity can influence an individual's behavior and how those ideas can be translated to cryptocurrency related crime. For my technical research problem, I was tasked with improving a help-request workflow by integrating automation tools in Slack. One of the solutions was building a Slack Bot that helped users retrieve general information about my team's service via slash commands. Slash commands are a way for users to make a bot execute some sort of task by sending it a command preceded by a forward slash. This project involved verifying HTTP requests with unique signatures and secrets, to ensure that incoming requests to my API endpoint were from my Slack Bot and not any malicious actors. This process is very similar to how transactions are verified in many cryptocurrencies, including Bitcoin. While these papers will not explicitly address this intersection, I think it is still important to understand the similarities in security practices in both blockchain technologies and enterprise software, as the same principles can be applied to other disciplines of software engineering.

For my technical research, I was tasked with helping a Northern Virginia based event management software company replace its inefficient and unorganized process for handling internal login help requests. To streamline the process and make it more intuitive, our development team implemented some of Slack's built-in automation tools and integrated a Slack Bot supported by AWS services. Slack offers a suite of automation tools through Workflow Builder which allowed us to add forms and automated messages to our help request workflow. We also used a Slack Bot to streamline the workflow by adding a functionality enabling users to

retrieve general information about our service through slash commands. The bot was supported by AWS resources including Lambda, API Gateway, and DynamoDB and the whole stack was deployed using CloudFormation. There was almost instant impact from the addition of these tools to our help request Slack channel as the developers on my team were able to handle requests at a faster rate and in a more organized manner. In addition, people asking for help about another service were deflected to the proper teams through the automated messages. In the future, we want to expand the functionality of the Slack Bot, creating a larger suite of slash commands. We also want more integration with our other tools like our Jira ticketing system and API logs.

In my STS research paper, I analyze how anonymity influences one's behavior and how those ideas can be applied to the use of cryptocurrency by criminals. Through my research, I discovered that total anonymity or even just perceived anonymity can lead one to act in ways that they normally wouldn't, and often in more deviant ways. I came to this conclusion by analyzing and combining knowledge found in previous studies done on the topic. These studies focused on how in real-world and lab settings, when individuals were under the assumption that their identity was hidden, by a disguise or some other means, they acted in more violent and aggressive ways. I also found that when the anonymity level of a cryptocurrency is increased, individuals seem to use them for criminal transactions, most notably in dark web marketplaces. This paper is intended to serve as a bridge between ideas in both social psychology and technology, and how the two work together hand in hand.

I believe that both my technical and STS research projects were a success, but there is plenty of room for expansion and improvements. Through my technical project, I was able to learn new software developing techniques while also reinforcing the foundation of software

development principles I have learned through my education. I was very satisfied with how my efforts made an immediate impact for my team, but would still like to expand the functionality of the bot as I feel like there is so much potential for it to be a great tool for our development team. My STS research achieved exactly what I wanted, which was to discuss how anonymity associated with cryptocurrency can influence criminal activity. I was very pleased with my methods and the results I gathered, but in the future, I think it could be useful to perform my own study rather than reviewing previous ones. It was difficult to find studies that directly analyzed how individuals use cryptocurrency when they are under the assumption of anonymity, which is something that I believe could expand on my STS research.