Thesis Project Portfolio

Non-Fungible Tokens: How NFTs Can Boost Customer Engagement in the Quick Service Restaurant Industry

(Technical Report)

The Influence of Blockchain Technology Stakeholders on the Environment

(STS Research Paper)

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Darwin Khemrin Khay

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Department of Computer Science

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Sociotechnical Synthesis

For a business to thrive, it's important that they have a loyal customer base. One of the ways a business can improve on an existing customer base is to consider finding ways to boost customer engagement. With the growth of blockchain technology in recent years, and with the introduction of non-fungible tokens (NFTs), businesses can implement a solution that entails the usage of NFTs to boost customer engagement. However, with any solution that a business may implement in general, it is important that they recognize the potential costs. In particular, blockchain technology is known to have intensive energy usage to maintain. High energy usage leads to problems such as a high carbon footprint which is destructive to the environment. Having said that, it's crucial that businesses and stakeholders understand all effects of it – the benefits and drawbacks. Therefore, my technical project and STS research paper both explore the usage of blockchain technology. My technical project concerned developing a technical solution involving non-fungible tokens (NFTs) for a quick service restaurant client to increase customer engagement. On the other hand, my STS research regarded investigating the motivations for contributing to blockchain technology by stakeholders as the reasons for the negative impact on the environment using Actor-Network Theory (ANT).

The technical capstone portion of my thesis produced a solution to increase customer engagement for a quick service restaurant client. My intern group and I first looked into why having NFTs would be beneficial for our client. This involved researching the current consumer demographics, and specifically looking at which specific demographics were not as prevalent within the quick service restaurant industry. Afterwards, we also researched the user demographics of blockchain technology and NFTs specifically. We found that there was an overlap between the least popular consumer demographic for quick service restaurants and the

most popular user demographics for NFTs. Because of this, we saw a reason for the usage of NFTs to be beneficial for our client. We then explored the different use cases of NFTs by other quick service restaurants to come up with the most plausible way of utilizing NFTs for our client. The most feasible way of implementing the usage of NFTs was to offer NFTs to the customers via redeemable codes. A customer would make a purchase, and on their receipt would be a code that they can use to claim a random NFT on the platform that my intern group developed. Each NFT holds a different rarity, which signifies a different number of voting value. The rarer an NFT, the higher the voting value. Customers can make more purchases to claim more NFTs and hold more voting power when voting for the next mystery menu item during occasional promotions held by our client. As a result, our client was able to boost customer engagement by crowdsourcing user input for additional menu items.

For my STS research, I identified the motivations of stakeholders of blockchain technology and used Actor-Network Theory (ANT) to show how the connection between the motivations are the reasons for the negative impact on the environment. Keeping in mind how blockchain technology uses high amounts of energy and that high energy usage is a cause for increased carbon footprint levels, I explained that the motivations of these stakeholders are the reasons for the extensive usage of such technology and therefore are a direct cause for the negative impact on the environment. First, I described how I will approach analyzing the motivations of the stakeholders by defining the key concepts and processes of ANT. After, I defined the actors that were relevant to blockchain technology and separated their motivations into different dimensions. After defining the key actors and motivations of blockchain technology, I explained the environmental impact as translation process by explaining how each actor plays a role in each step of the process. I concluded by stating that the whole process is a

negative feedback loop of high energy usage. On a final note, I brought up possible mitigations to combat the existing system that blockchain technology uses so that there can be ways to reduce the energy used.

Both my technical capstone and STS research explore the impact of blockchain technology, in which my technical capstone explores the benefits, and my STS research explores the drawbacks. They complement each other since they explain that with blockchain technology, there can exist good valuable impacts on society as well as negative impacts. The stakeholders of blockchain must understand that there aren't solely one or another when using the technology. There must be a fundamental understanding of both by stakeholders to garner the best possible outcome when using the technology. It's important that there is not just an understanding of the impacts themselves, but also an understanding for the reasons and motivations behind these impacts. Only then will the benefits and costs of using such technology will be balanced in a way that would provide the most net good for society. Although my research is limited to blockchain technology, it can be expanded beyond such because there are other prevalent types of technology out there that have as much significant benefits as costs.