

Thesis Project Portfolio

Implementing a Blockchain-Based Voting System: Exploring the Use of Decentralized Technology for Transparent and Fraud-Resistant Elections

(Technical Report)

How Do Video Game Design and Monetization Strategies Mimic Gambling Mechanisms to Exploit Addictive Behaviors and Contribute to Pathological Gaming and Gambling?

(STS Research Paper)

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Bachelor of Science, School of Engineering

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Thesis Prospectus

Sociotechnical Synthesis

The technical report explores the potential of using decentralized technology—specifically a blockchain-based framework supplemented with advanced encryption algorithms—and proposes a theoretical implementation. It describes the system components and voting procedure involved in its application. Recognizing the shortcomings of traditional voting systems in preventing corruption and the inherent qualities of blockchain that naturally align with fair election requirements such as immutability and anonymity, this report aims to evaluate the advantages and disadvantages of using a decentralized framework, explore how existing technologies may be adapted for electoral purposes, and gauge the feasibility of the proposition.

Drawing on established features of an ideal fair-election model, the report examines the use of a range of technologies to ensure compliance with these features, such as advanced encryption algorithms for enhanced security, smart contracts to streamline and automate voting, and physical voting machines to prevent identity fraud during registration. Ultimately, the proposal outlines a three-step voting procedure designed to address critical considerations for a fair voting system.

The STS research paper examines a growing trend in the video game industry where the revenue model has shifted from a one-time purchase to free-to-play or fully priced games that include microtransactions, encouraging continuous spending and potentially fostering problematic gambling behaviors among gamers. Microtransactions broadly refer to any type of in-game content that can be purchased after initially buying or playing the game, ranging from cosmetic modifications to expansions that offer additional storylines or otherwise inaccessible content. The paper focuses on loot boxes, which have rapidly grown in popularity

due to their proven success as a revenue model. Loot boxes are digital containers that players can purchase with real money to obtain a random item from a predetermined set of possible rewards. This form of microtransaction bears striking similarities to gambling, particularly to slot machines, despite not being classified as gambling due to technical definitions.

Supported by psychological literature, the research examines the similarities between loot boxes and traditional gambling from both an engineering and psychological perspective and discusses the ethical implications of this business practice to shed light on an often-overlooked problem.

The paper's case study explores a unique instance of video game "gambling" known as "skins betting," where items obtained from loot boxes in the game Counter-Strike: Global Offensive (referred to as skins) can be used to place bets on competitive eSports matches and converted into real money. The case highlights a peculiar instance of video game gambling where the distinction between it and traditional gambling is virtually nonexistent, yet a regulatory framework has not been established and is unlikely to be due to inherent challenges of regulating gambling mechanics within inside video games.

The technical report and STS research paper delve into completely different topics but are of great personal interest to me. They offer unconventional perspectives and approaches to their respective subjects. The technical report separates decentralized technologies from their traditional cryptographic domain and proposes their use for an alternative purpose. Meanwhile, the STS paper presents a discourse on video games from ethical, psychological, and legal perspectives, highlighting a business practice with severe yet overlooked ethical implications. Together, these papers present compelling discussions and a unique perspective on these topics.