

Bucharest University of Economic Studies

The Faculty of Economic Cybernetics, Statistics and Informatics

IT&C Security Master

DISSERTATION THESIS

Coordinator

Ph. D. Cristian TOMA

Graduate

Mihail Rareș NEDELCU

Bucharest

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E-VOTING APP BASED ON BLOCKCHAIN

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Statement regarding the originality of the content

I hereby declare that the results presented in this paper are entirely the result of my own creation unless reference is made to the results of the other authors. I confirm that any material used from other sources (magazines, books, articles, and Internet sites) is clearly referenced in the paper and is indicated in the bibliographic reference list.

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# Introduction

Since we were kids, we all wanted to grow and take part to the voting process. It was such a mature action, it seemed like it involved a lot of knowledge and that its power was immense. Now, that we’ve grown, we can clearly see that a vote has immense pressure on us, voters, but also on those who are in charge of the entire organization of the process. Entire institutions must be organized in a way that is as efficient as possible and allows for a seamless voting process. Each voter must be identified and verified for their right to vote, then receive their ballot and stamp so they can go to the booth to choose their favorites. It is a complicated process that requires a lot of organizational skills, time, and human resources.

In contemporary democracies, the public trust in electoral outcomes decreases and people start to really question the existing infrastructure and its credibility. Even though we live in such a digitalized world, the vote counting process has lagged behind. We rely on a lot of people to put in a considerable effort to provide the population with statistics following their votes.

This dissertation investigates the design and implementation of a voter authentication architecture, focusing on how emerging technologies can strengthen democratic processes by mitigating identity fraud end enhancing trust in digital voting.

Blockchain technology has emerged as a viable option for transparent and safe electronic voting systems. E-voting systems can enhance voter anonymity, reduce fraud and manipulation and boost election process trust by utilizing blockchain technology’s decentralization, immutability and transparency. Furthermore, compared to traditional voting methods, blockchain-based electronic voting systems can save money and time.

Conventional voting methods sometimes depend on centralized organizations, which can create weaknesses like election fraud or result manipulation. A potential remedy for the shortcomings of conventional and other e-voting methods is provided by the decentralized and unchangeable characteristics of blockchain technology. It can provide a transparent and impenetrable platform for electronic voting. By combining consensus protocols and cryptographic techniques, blockchain-based electronic voting systems offer safe, verifiable and auditable voting processes.