IERG 4998 IJ01 Final Year Project I

Web application for e-voting using Blockchain and smart contract

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**Abstract**

The security of online voting has been questioned. Blockchain with smart contract is a good solution. In this project, we explore the advantages and disadvantages of Blockchain and its solutions by simulating a student poll. In order to make the voting more realistic and user-friendly, we put the voting function on the web application.

**1. Introduction**

There is no doubt that digitalization is the trend of today's society. Although digitalization brings a lot of convenience to people, their security has always been a hidden danger that should not be ignored. In the past, our solution was only to avoid carrying out things online that would have major security problems. However, due to the epidemic of the Corona Virus, we are forced to do things online that require maximum security, such as voting.

The benefit of online voting is that it saves time in counting votes and avoids invalid votes. However, an insecure voting system not only fails to ensure its fairness, but may also lead to a breach of voter information[1]. Blockchain and smart contracts, with their decentralized and unalterable properties, make them a perfect solution to ensure the fairness. The major usage of Blockchain is to record transactions for cryptocurrency, like Bitcoin. But nowadays people are trying to combine Blockchain with different areas due to its security. On the other hand, smart contracts handle and execute all transactions under this system. It guarantees that once the transaction has made, no one can modify or alter it. Which means that voting with Blockchain and smart contract retain the property of non-repudiation[2][3].

In this project, we focus on designing a smart contract for e-voting. To better represent what needs to be taken into account when voting, we designed a scenario where students in a faculty vote for their favorite professor. We can also implement the diversity of voting in this way.

At the time we did this project, smart contracts and Blockchain were still highly discussed by the public. However, the public lacks the appropriate knowledge. The voting method thus cannot require the voters to have any knowledge on know how to use Blockchain. Therefore, we are going to implement it in a web application so that it can be used more intuitively. Another benefit of making it a website is easy access, which is an important element in the design of an application for the general public.

**2. Related Work**

**3. Methodology**

**4. Result**

**5. Conclusion**

**6. Further Discussions**

**7. Appendix: source code of voting system**

**8. Reference**

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