

Survey Paper on Blockchain Based Crowdsourcing Systems and automation of Question Paper Generation

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ABSTRACT

This paper presents a review on blockchain based crowdsourcing systems in view for automating question paper generation. The system is designed to provide a decentralized platform for question paper generators and to ensure the quality of the generated papers by taking input of questions through various anonymous users. The system is based on the Ethereum blockchain and uses smart contracts to automate the paper generation process. To maintain the quality and relevance of questions selected, the system is a decentralized autonomous organization where members can decide to keep the question or reject it. The paper describes a review of the existing systems and the smart contracts. The paper also presents the results of the system evaluation and additional features needed to fulfil the requirements of the project.

Keywords: *blockchain, crowdsourcing, question bank, DAOs, question paper generation, smart contracts*

1. INTRODUCTION

In recent years, there has been a growing interest in blockchain based crowdsourcing systems. These systems have the potential to provide a more secure and efficient way of crowdsourcing. Blockchain technology can provide a decentralized and tamper-proof way of storing data and transactions. This can allow for more transparent and secure crowdsourcing. Additionally, blockchain based crowdsourcing can allow for more efficient and effective use of resources. Question papers were traditionally generated by a panel of experts who would design questions based on the syllabus. As per S. -C. Hu, I. -C. Chen and Yaw-Ling Lin this process could be time-consuming and often resulted in questions that were not always relevant to the students [2]. Crowdsourcing can change this by allowing students to submit questions that they believe to be relevant to the syllabus. This would allow for a more relevant and up-to-date question paper. In addition, it would also save time as the panel of experts would not need to design the questions themselves.

Bias less question paper generation is important to ensure that all students have an equal opportunity to succeed in an examination. By ensuring that the question paper is not biased towards any particular student or group of students, the examination process becomes fairer and just. This in turn, helps to promote equality and fairness in society.

1.1 Blockchain

The blockchain is a distributed database that allows for secure, transparent and tamper-proof recordkeeping. Each block in the chain contains a cryptographic hash of the previous block, a timestamp, and transaction data. The chain is stored in a decentralized network of computers, each of which verifies and records all transactions. The result is a public, secure ledger that cannot be altered retroactively without the consensus of the network.

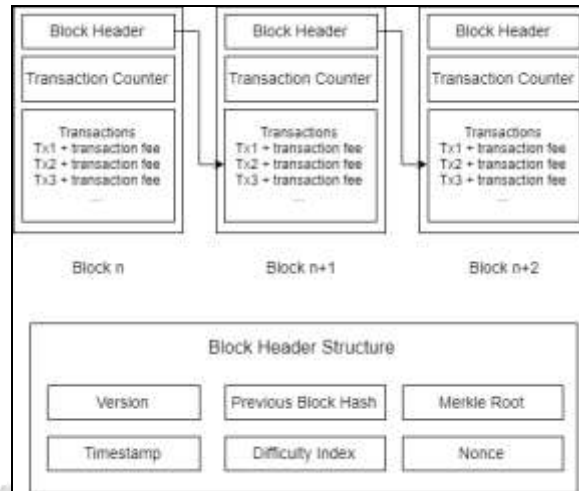


Figure 1: Blockchain Architecture

Blockchain technology is often described as the backbone of the new internet. By allowing digital information to be distributed but not copied, blockchain creates a new way to securely store and transfer data. The potential implications of this are far-reaching and have already begun to be realized in a number of industries. From banking and finance to healthcare and supply chain management, the applications of blockchain are only limited by the imagination.

1.2 Crowdsourcing

Crowdsourcing is a term used to describe the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers. Crowdsourcing is popular because it can be an efficient way to get what you need without having to go through the usual channels. It also allows you to tap into a larger pool of potential workers or contributors than you could otherwise access.

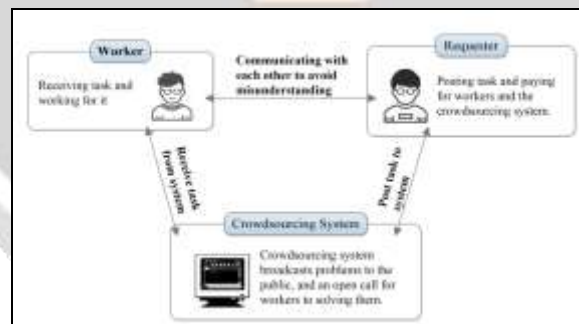


Figure 2: Traditional Crowd-sourcing System

Crowdsourcing can be an effective way to get ideas or suggestions for new products or services, to solicit feedback on existing ones, or to generate new content for a website or blog. It can also be used to raise funds for a new business venture or project.

1.3 IPFS

IPFS (InterPlanetary File System) is a decentralized file storage system that allows users to store and share files in a peer-to-peer network. IPFS is important because it is a more efficient and secure way to store and share files than traditional file storage systems. IPFS is also censorship-resistant, meaning that users can access and share files even if some governments or organizations try to block them.

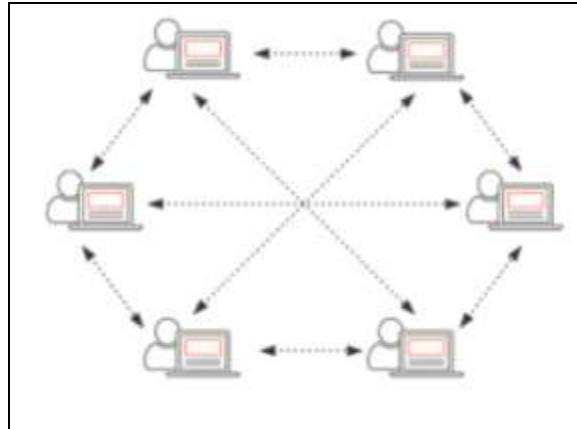


Figure 3: IPFS Architecture

IPFS has the potential to revolutionize the way we store and share files online. It is more efficient than traditional file storage systems because it distributes files across a network of computers instead of relying on a single server. This means that files can be accessed even if some parts of the network are down. IPFS is also more secure than traditional file storage systems because it uses cryptographic hashes to verify the integrity of files. This means that files cannot be modified without changing the hash, which would be immediately detected by other users.

2. LITERATURE REVIEW

Crowdsourcing is an increasingly popular way to outsource tasks to a large group of people. It has been used extensively in a variety of domains such as software development, data annotation, and now question paper generation. Y. Lin and C. Zhang in their paper 'Crowdsourcing System Based on Blockchain' [1], reviews the state of the art in blockchain-based crowdsourcing systems. They cover the existing work on the application of blockchain in crowdsourcing and identify the unique challenges involved in blockchain-based crowdsourcing systems, and discuss the potential of blockchain in this domain. The authors propose the use of IPFS for a decentralized storage system. Quadratic voting is the collective decision-making process used for keeping a count of the votes in any case of dispute resolution. This paper provides a complete design of the decentralized crowdsourcing system which can resist network attacks and solve single point of failure.

Question paper generation is a complex task that requires knowledge of a wide range of topics, and the ability to generate questions that are both relevant and challenging. There are a number of existing question paper generation systems, however these systems often require a significant amount of human input, and are therefore expensive and time-consuming to use. The authors of the paper 'Designing a Restful Question Bank Service in Cloud' [2] S. -C. Hu, I. -C. Chen and Yaw-Ling Lin propose a method for designing a question bank in the cloud and allow users to access these resources under any circumstances.

Blockchain being a decentralized platform to maintain any system makes it almost impossible for frauds and censorship. One drawback of blockchain is the ever-increasing cost that the user has to pay in order to utilize the resources and storage. While this is not a feasible approach for society there is a need for distributed and decentralized storage that is accessible anytime and from anywhere. M. Steichen, B. Fiz, R. Norvill, W. Shbair and R. State in their paper 'Blockchain-Based, Decentralized Access Control for IPFS' [5] propose to use Inter Planetary File System (IPFS) to overcome the cost issues with appropriate decentralized resources. IPFS stores the entire file on a peer-to-peer network of IPFS nodes and generates Content Identifier (CID) which can then be stored on the blockchain and mapped to the owner of that file. This paper addresses the requirement of blockchain applications to share large files.

3. PROPOSED SYSTEM ARCHITECTURE

The system architecture for a blockchain based crowdsourcing system would consist of a distributed ledger that would be used to store the crowd sourced data. The data would be collected from a variety of sources and would be then used. The system would be decentralized and would allow for a transparent and secure process.

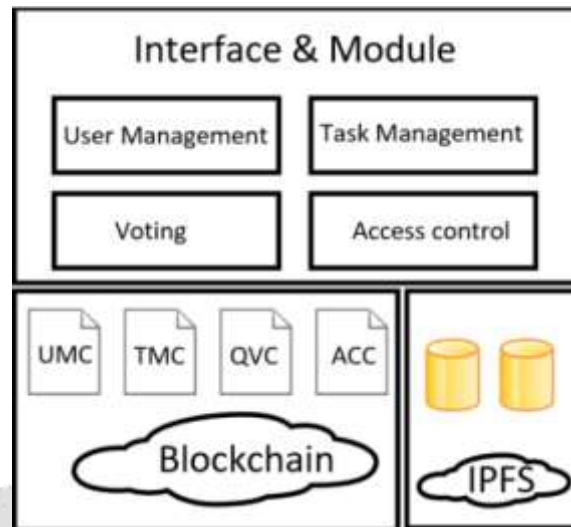


Figure 4: Blockchain based crowdsourcing system architecture

The system would be built on a blockchain platform and would use smart contracts to facilitate the crowd sourcing process. The smart contracts would be used to track the data collected from the various sources. The system would be secure and would ensure that the data collected is not tampered with. It would be scalable and would be able to handle a large number of users and be able to process the data collected from the various sources in a timely manner as per the requirements.

4. CHALLENGES

Crowdsourcing systems that automate question paper generation face several research challenges. One challenge is to design a system that can generate high-quality question papers. Another challenge is to ensure that the system is secure and cannot be tampered with. Finally, the system must be able to handle a large number of users and a large number of submissions.

One way to design a high-quality question paper generation system is to use a blockchain. Blockchain is a distributed database that allows for secure, tamper-proof transactions. This would allow for a secure, tamper-proof system that could handle a large number of users and submissions. However, blockchain is a new technology and there is still much research to be done in this area.

The unique challenges involved in blockchain-based question paper generation include the need for a mechanism to incentivise participants, and the need to ensure the quality of the generated question papers. These challenges can be overcome by utilizing existing blockchain-based incentive mechanisms.

6. CONCLUSIONS

The proposed system can benefit society in multiple ways. The system is designed to make the crowdsourcing process easier and more efficient with added security and immutability. Also, the system can help institutions to reduce their dependence on traditional centralized ways of decision making. The system can also help to save time and money by crowdsourcing much of the work while ensuring security with the power of blockchain.

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