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An Analysis of Decentralized and Centralized Freelancing

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Abstract

In an ever-evolving digital landscape, the traditional freelance marketplace model faces challenges in terms of trust, transparency, and efficiency. The previous studies introduced a paradigm - a centralized Freelance Marketplace leveraging the Centralized server-based infrastructures. Those systems were leveraged a centralized technology to create a highly scalable and high speed application of freelancing. Due to inflict in some departments of these applications the new paradigm – a Decentralized Freelance Marketplace has been introduced where secure, transparent, and trustless environment for freelancers and clients were present to engage in a peer-to-peer manner. This study delves into the design, implementation, and potential benefits of this decentralized freelance marketplace, exploring the underlying blockchain architecture and smart contract functionalities that underpin its operation.

Keywords: Blockchain; Smart Contract; Decentralization; Freelance; Ethereum.

1. Introduction

This introduction acts as an initial exploration before the upcoming conversation, which intends to explore the design, execution, and probable benefits of this decentralized marketplace. It aims to offer a glimpse into the internal functioning of blockchain technology, the operational aspects of smart contracts, and the potentially groundbreaking nature of this model for the freelance industry. While progressing through the subsequent sections, readers will uncover the potential for a Decentralized Freelance Marketplace utilizing blockchain technology to potentially reformulate the landscape of employment, presenting freelancers and clients with a prospect of a fairer, streamlined, and less centralized future.

What is Freelancing?

Freelancing is a type of self-employment. Instead of being employed by a company, freelancers tend to work as self-employed, delivering their services on a contract or project basis. Freelancers offer their services directly to clients or through internet platforms. There are several websites that allow clients and companies to search for skilled professionals to work on their projects. Freelancers develop their profiles and portfolios on these websites and can bid on projects that are relevant to their skills. They also use social media as a tool to market their skills and get clients. Freelancers are typically hired on a contract basis and are paid according to the nature and duration of the work. Companies of all types and sizes can hire freelancers to complete a project or a task, but freelancers are responsible for paying their own taxes, health insurance, pension and other personal contributions. Since they work for themselves, freelancers must also cover their own holiday costs and sick pay. At the same time, self-employed professionals can set their own working hours and make working arrangements that fit their lifestyle – either working remotely or from their clients' offices.

Blockchain

Blockchain is a decentralized and distributed digital ledger technology that is used to record transactions across multiple computers in a way that ensures the security, transparency, and immutability of the data. It was originally created as the underlying technology for crypto currencies like Bit coin, but its applications have since expanded beyond digital currencies to various industries and use cases. Blockchain is frequently claimed to be an "unhackable" technology. But 51% attacks allow threat actors to "gain control over more than half of a blockchain's compute power and corrupt the integrity of the shared ledger. … While this particular attack is expensive and difficult, the fact that it was effective means that security professionals should treat blockchain as a useful technology—not a magical answer to all problems."

Ethereum

Ethereum is a decentralized global software platform powered by blockchain technology. It is most commonly known for its native crypto currency, ether (ETH). Ethereum can be used by anyone to create any secured digital technology. It has a token designed to pay for work done supporting the blockchain, but participants can also use it to pay for tangible goods and services if accepted. The Ethereum blockchain, with its programmable capabilities, has become a primary enabler of this shift. It empowers developers to create smart contracts that can automate various aspects of freelancing, from job creation and matching to payment and dispute resolution. By utilizing Ethereum's native cryptocurrency, Ether, these platforms offer secure and borderless payment solutions, transcending the limitations imposed by traditional banking systems and currencies.

Importance of Decentralized systems:

In this rapidly evolving digital landscape, this paper explores the concept of a Decentralized Freelance Marketplace and its utilization of blockchain technology. The central idea is to create a system that facilitates direct, peer-to-peer(p2p) interactions between freelancers and clients, eliminating the need for intermediaries and fostering an environment of trust and accountability. Through the use of blockchain and smart contracts, the marketplace ensures secure and automated transactions, reducing the risk of fraud and enabling dispute resolution in a transparent manner. By enabling secure, tamper-proof, and self-executing smart contracts, the platform minimizes fraud and intermediary costs while ensuring timely payments and dispute resolution. Key features of the decentralized marketplace include the elimination of intermediaries, reduced fees, global accessibility, and a reputation system that promotes accountability with security premises.

2. Literature Review

Blockchain technology is versatile, extending beyond finance and digital currencies. It's valuable for applications requiring decentralized reliability and transparency among untrusting parties, like document validation, digital identity protection, supply chain management, secure voting systems, and automated smart contracts.

Decentralized Freelancing using Ethereum Blockchain [1] proposed a blockchain-based system to provide trust between employer and employee and ultimately, trying to solve different issues of centralized

freelancing Marketplace websites. Their system contains Ethereum blockchain based backend which leads to higher security. They have implemented a fully decentralized freelancing system with all the aforementioned advantages.

A Case Study of Execution of Untrusted Business on Permissioned Blockchain [2] the work in this study analyzes varied studies done to boost the performance of centrally controlled business processes, and states that the foremost serious problems with the centralized systems square measure lack of trust and divided information on totally different confidential ledgers. To beat this, it suggests the utilization of blockchain technology, which solely eliminates the necessity of a trustworthy third party however conjointly provides a distributed shared ledger.

A Blockchain-Based Decentralized System for Proper Handling of Temporary Employment Contracts. [3] The paper proposes a blockchain-based system that aims to ensure respect for the rights of all actors involved in temporary employment, in order to provide employees with the fair and legal remuneration of work performances and protection in the case employer becomes insolvent. Their system also assists employers in processing contracts with a fully automated and fast procedure

Work Capacity of Freelance Markets: Fundamental Limits and Decentralized Schemes. [4] In this work, they tend to confirm the capability of freelance markets, in terms of most glad job requests, and propose centralized schemes that deliver the goods capability. To confirm decentralized operation and freedom of selection for purchasers and freelancers, they have presented straightforward compatible system with the working of present crowdsourcing platforms that around deliver the goods capability.

How the blockchain enables and constrains supply chain performance. [5] The purpose of this paper is to understand the enabling and constraining roles of blockchain technology (BCT) in managerial work practices and conceptualize the technology–performance relationship in supply chain management (SCM). Design/methodology/approach A structured literature review and a theory-driven approach are used. A set of propositions are developed, suggesting how the use of BCT in supply chains can be understood to simultaneously enable and constrain SCM and performance.

A case Study on Gig Economy. [6] The trend toward a gig economy predicted that by 2025, 40% of American employees would be self-employed. Globally, India is the second-largest freelance workforce after the US. There are lots of issues in a centralized system handling this economic model which can be solved by a decentralized system.

Crowd work platforms: juxtaposing centralized and decentralized governance. [7] Crowd work is a novel form of digitally mediated work arrangement that is managed and organized through online labor platforms. This paper focuses on the governance of platforms that facilitate creative work—that is, complex work tasks that require high-level skill and creative workers. Crowd work platform governance faces numerous challenges as a result of technology mediation, scalable and distributed workers, and temporary work arrangements. Creative crowd work platforms, such as Top coder, typically require additional governance structures to manage complex tasks.

Hire Chain - Decentralized Freelancing System. [8] The paper states freelance job is the one where an individual works for themselves. Instead of being an employee of a company to perform a particular job, freelancers are self-employed and they search for work from different sources of majorly online sources. An employer hires a freelancer to complete their task, project, or service for them within the given timeframe. Freelancers often work various projects simultaneously for different clients. Both employer and employee may face various issues regarding unreliability, poor communication, late payment, delayed work, etc. In this paper, we proposed a blockchain-based system to provide trust between employer and employee and ultimately, trying to solve different issues in this process.

3. Methodology

This endeavor involves the creation of a comprehensive decentralized application that encompasses both front-end and back-end components. The front-end operation utilizes HTML, CSS, JavaScript, and Angular JS to establish an agile and adaptable graphical user interface. On the other hand, the back-end infrastructure relies on the Ethereum Blockchain, facilitated by the MetaMask Extension. Smart Contracts, scripted in Solidity, are deployed via the Remix IDE specifically on the Test Network. The communication bridge between the front end and smart contracts is established through Web3.js. To facilitate interaction, distinctive Ethereum addresses and Application Binary Interface (ABI) are employed. The Ethereum public blockchain houses three distinct smart contracts responsible for storing user account data, job details, and reviews. The association between content and users is maintained through unique hashes, while GitHub serves as the platform for project sharing, leveraging its robust CICD setup.

The six steps in this process are as follows:

(i) Registering onto the Platform.
(ii) Posting a Job.
(iii) Applying for the Job.
(iv) Selecting a Freelancer.
(v) Confirmation of Work.
(vi) Cancelling the Job.

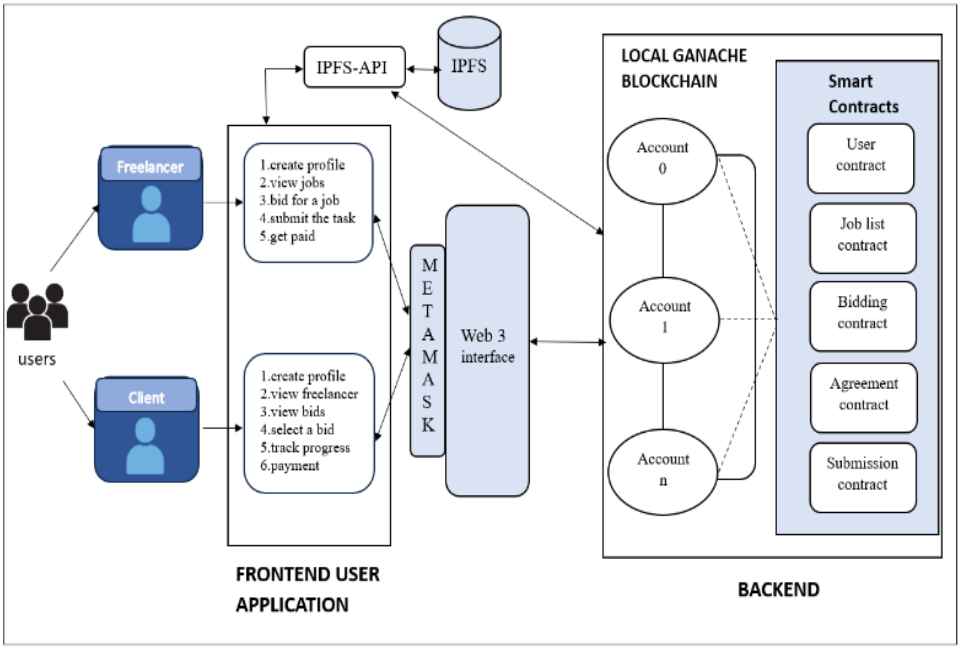

Fig. 3.1. Proposed System implementation.

4. Conclusion

The study talk about how blockchain technology can improve trust, security, and efficiency in freelancing and decentralized work platforms. They highlight blockchain's role in eliminating the need for intermediaries and ensuring data security. Some also focus on fair compensation, decentralized operation, and supply chain management in the gig economy. Overall, they underscore blockchain's potential to enhance freelancing and work platforms.

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