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Connect to Crowd

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Abstract: *Crowdsourcing (CS) involves gathering needed services, ideas, or content by soliciting contributions from a broad audience, particularly from online communities. In our proposed system, we aim to implement a budget-constrained online crowdsourcing framework by introducing a two-tiered social crowdsourcing architecture. To improve these models, we create incentive mechanisms that enhance computational efficiency, individual rationality, budget feasibility, cost accuracy, and time accuracy. Crowdsourcing platforms are vital for promoting transparency and collaboration among participants, all while reducing resource use and costs. To support this, these platforms include mechanisms for monitoring and evaluating worker performance. Our project introduces a secure multi-tiered worker quality evaluation framework utilizing blockchain technology. Our Proof of Concept (PoC) analysis demonstrates that blockchain effectively addresses security concerns such as trust, privacy, and accountability in current worker performance evaluation systems.*

Keywords: Crowdsourcing, Incentive Mechanisms, Blockchain Technology, Worker Quality Evaluation, Budget-Constrained Framework

I. INTRODUCTION

Crowdsourcing (CS) harnesses the collective effort of a large group, often via online platforms, to gather services, ideas, or content. This method capitalizes on the diverse skills and insights of a broad community to achieve tasks more efficiently and creatively. Our proposed system aims to refine this process by implementing a budget-constrained online crowdsourcing model featuring a two-tiered social architecture. This approach segments the crowdsourcing process into an initial phase where a wide base of contributors provides input, followed by a specialized phase for refinement and evaluation. To enhance this system, we introduce incentive mechanisms designed to optimize computational efficiency, individual rationality, budget feasibility, cost truthfulness, and time truthfulness. These mechanisms are crucial for ensuring fair and effective participation. Additionally, our framework incorporates a secure multi-tier worker quality evaluation system based on blockchain technology. This integration addresses key security concerns such as trust, privacy, and accountability, which are often problematic in traditional crowdsourcing evaluations. Through our Proof of Concept (PoC) analysis, we demonstrate that blockchain effectively mitigates these issues, thereby improving the overall integrity and performance of the crowdsourcing system.

II. LITERATURE SURVEY

Crowdsourcing, a practice of leveraging the collective intelligence of large groups to obtain services, ideas, or content, has evolved significantly, driven by advances in technology and an increasing need for innovative solutions across various domains. Traditional crowdsourcing systems have focused on harnessing the power of diverse, often anonymous contributors to perform tasks ranging from data collection to creative input. However, these systems face substantial challenges related to budget constraints, worker quality, and security. Budget constraints particularly challenge the sustainability and effectiveness of crowdsourcing initiatives, necessitating the development of models that balance cost with the quality of contributions. A prominent approach to addressing these issues is the introduction of a two-tiered crowdsourcing architecture, which segments the crowdsourcing process into different phases or levels. The first tier typically involves a broad base of participants providing initial inputs, while the second tier consists of more specialized individuals who refine and validate these contributions. This stratified approach not only enhances the quality of the output but also optimizes resource allocation by leveraging specialized skills at different stages of the

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process. To complement this architecture, incentive mechanisms are crucial for ensuring that contributors are motivated and engaged. These mechanisms must address several factors, including computational efficiency, individual rationality, budget feasibility, cost truthfulness, and time truthfulness. Effective incentives align participants' motivations with the goals of the crowdsourcing project, ensuring that their contributions are both honest and valuable. Transparency and collaboration are also vital aspects of modern crowdsourcing platforms. By promoting open communication and clear processes, these platforms can foster trust and cooperative effort among participants, leading to better outcomes and more efficient resource use. In addition to these improvements, the integration of blockchain technology offers a promising solution to some of the longstanding issues in crowdsourcing systems, particularly concerning trust, privacy, and accountability. Blockchain's decentralized and immutable ledger provides a robust mechanism for secure and transparent tracking of contributions and evaluations, addressing concerns about data tampering and ensuring that performance assessments are accurate and tamper-proof. Research has shown that blockchain can significantly enhance the security and integrity of crowdsourcing platforms by maintaining transparent records and ensuring that all transactions are verifiable. The Proof of Concept (PoC) analysis of blockchain-based systems in crowdsourcing demonstrates that these technologies can effectively tackle the security concerns associated with traditional evaluation systems. The application of blockchain not only secures data but also provides a clear and accountable way to monitor and verify worker performance, thereby enhancing the overall effectiveness of crowdsourcing initiatives. This approach, combined with a well-structured two-tiered architecture and strategic incentive mechanisms, represents a significant advancement in the field of crowdsourcing. It addresses the multifaceted challenges of managing contributions, optimizing resources, and maintaining security, setting the stage for more effective and sustainable crowdsourcing systems in the future.

III. WORKING OF PROPOSED SYSTEM

In our proposed system, we aim to enhance online crowdsourcing by implementing a budget-constrained model featuring a two-tiered social architecture. This architecture separates the crowdsourcing process into an initial phase, where a wide base of contributors provides input, and a secondary phase for specialized refinement and evaluation. To support this model, we introduce incentive mechanisms that ensure computational efficiency, individual rationality, budget feasibility, cost truthfulness, and time truthfulness. These mechanisms are designed to align participant behavior with project goals, making the system both cost-effective and fair. Crowdsourcing platforms play a critical role in promoting transparency and fostering collaborative engagement among participants while striving to reduce resource consumption and costs. Our system incorporates a secure, multi-tier worker quality evaluation framework based on blockchain technology. This framework addresses key security concerns such as trust, privacy, and accountability, which are common in traditional performance evaluation systems. Through our Proof of Concept (PoC) analysis, we demonstrate that blockchain effectively resolves these issues, ensuring a reliable and transparent evaluation process. The system operates through a series of steps: initialization, where users register and exchange keys with a smart contract; task management, involving the submission, evaluation, and acceptance of tasks; and task evaluation, where results are reviewed and rewards are distributed based on performance. This approach offers several advantages, including reduced management overhead and the ability to engage a global pool of innovators. Crowdsourcing not only allows companies to access diverse talent and innovative solutions but also provides participants with opportunities to showcase their skills, potentially leading to future job offers.

IV. TECHNOLOGY USED

Visual studio 2022

Visual Studio 2022, the latest iteration of Microsoft's integrated development environment (IDE), brings significant enhancements and new features aimed at improving developer productivity and experience. As a comprehensive development platform, Visual Studio 2022 supports a wide range of programming languages and development scenarios, including .NET, C++, JavaScript, and Python, among others. One of the most notable improvements in Visual Studio 2022 is its support for 64-bit architecture. This upgrade allows the IDE to handle larger projects and more complex solutions with greater stability and performance. The transition to a 64-bit application means that developers can work with more extensive codebases without encountering the memory limitations that were a constraint in

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previous versions. The user interface of Visual Studio 2022 has also seen significant updates. It features a more modern and streamlined design, with improvements in navigation and accessibility. The new streamlined UI enhances the overall developer experience by providing a cleaner and more intuitive workspace. Additionally, the IDE includes improved code navigation and search capabilities, making it easier for developers to locate and manage their code. Visual Studio 2022 introduces advanced features such as IntelliCode, which uses machine learning to provide context-aware code suggestions. This AI-powered feature helps developers write code more efficiently by offering relevant code completions based on their coding patterns and the best practices from across the community. Another notable feature is Live Share, which enables real-time collaborative development. This tool allows developers to share their coding sessions with others, facilitating easier pair programming and team collaboration. Performance improvements are a key focus of Visual Studio 2022. The IDE has been optimized for faster load times, reduced latency, and improved responsiveness, contributing to a more efficient development workflow. The new version also includes enhancements in debugging and testing tools, making it easier for developers to identify and fix issues quickly. Integration with cloud services is another highlight, with Visual Studio 2022 offering enhanced support for Azure and other cloud platforms. This integration simplifies the process of deploying and managing cloud-based applications, allowing developers to leverage cloud resources more effectively.Overall, Visual Studio 2022 represents a significant advancement in the evolution of development environments. Its support for 64-bit architecture, modernized interface, AI-driven code assistance, real-time collaboration features, and improved performance and cloud integration collectively make it a powerful tool for modern software development.

ASP.Net

ASP.NET is a robust web development framework developed by Microsoft, designed to facilitate the creation of dynamic, data-driven web applications and services. Part of the .NET ecosystem, ASP.NET offers a comprehensive set of tools and libraries for building scalable and high-performance web solutions. It supports multiple programming models, including Web Forms, MVC (Model-View-Controller), and Web API, allowing developers to choose the approach that best fits their project needs. One of ASP.NET's key features is its integration with the .NET platform, which provides a consistent programming model and extensive library support. ASP.NET Core, the modern evolution of ASP.NET, offers enhanced performance, cross-platform capabilities, and a modular architecture, enabling applications to run on Windows, Linux, and macOS. It also includes built-in support for dependency injection, making it easier to manage application components and improve testability. Security is another strong suit of ASP.NET, with features such as built-in authentication and authorization, data protection, and anti-forgery mechanisms that help safeguard web applications from common threats. Additionally, ASP.NET's seamless integration with various data sources and cloud services, such as Azure, streamlines the development of cloud-based applications. Overall, ASP.NET is a powerful framework that supports modern web development practices and offers a robust environment for creating secure, scalable, and high-performance web applications.

C#.net

C# is renowned for its robust type-checking capabilities, which help to prevent common programming errors and enhance code reliability. It features automatic garbage collection, simplifying memory management and reducing the risk of memory leaks. The language's clean and expressive syntax makes it accessible to both novice and experienced developers. C# follows core object-oriented programming principles such as encapsulation, inheritance, and polymorphism, which promote the development of reusable and modular code, thus improving maintainability. A key benefit of C# is its seamless integration with the .NET framework, which offers a rich library of pre-built components and a Common Language Runtime (CLR) that manages program execution. This integration simplifies the development process and boosts application performance. Furthermore, C# supports asynchronous programming with the `async` and `await` keywords, facilitating the creation of responsive and scalable applications, including web services. Developers using C# can leverage powerful tools provided by Visual Studio, Microsoft's advanced integrated development environment (IDE). Visual Studio includes features like code completion, debugging, and performance profiling, which help in writing efficient and error-free code. These tools streamline the development process and enhance productivity, making C# a popular choice for a wide range of programming tasks. Overall, C# combines the

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strengths of previous languages with modern programming practices, offering a robust, flexible, and efficient solution for building high-quality applications. Its integration with the .NET framework, support for advanced programming techniques, and the comprehensive development tools provided by Visual Studio make it an invaluable asset for developers aiming to create reliable and scalable software.

Blockchain technology

Blockchain technology represents a revolutionary approach to data management through its decentralized and distributed ledger system. Unlike traditional centralized databases, blockchain functions on a peer-to-peer network where every participant, or node, maintains a complete copy of the ledger. This decentralized structure enhances data security and integrity, making the system highly resistant to tampering and fraud. Data within a blockchain is organized into blocks that are sequentially linked together. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction details, creating a chain that ensures data immutability. Altering any block would require changes to all subsequent blocks, a task that demands considerable computational effort. A key advantage of blockchain is its transparency; all network participants can view the same ledger, facilitating easy verification of transactions. Additionally, blockchain employs consensus mechanisms such as Proof of Work (PoW) and Proof of Stake (PoS) to validate and agree on transactions, ensuring network security and preventing issues like double-spending. Beyond its use in cryptocurrencies, blockchain has a wide range of applications, including supply chain management, financial transactions, voting systems, and smart contracts. Its decentralized, transparent, and secure nature makes it a transformative technology across various industries.

V. DATABASE DESIGN

A database consists of interconnected files tailored for real-time processing, housing critical data that supports problem-solving and allows multiple users to access it simultaneously. The primary objective of database design is to ensure that data access is easy, cost-effective, and adaptable to user needs. This process involves defining and specifying the structure required for the client/server system, ensuring that business objects, which represent the information visible to users, are accurately modeled. Effective database design also requires normalization to maintain data integrity and efficiency. A Database Management System (DBMS) plays a vital role in safeguarding and organizing data, keeping it distinct from other resources like hardware and software. It offers unique features, particularly the separation between logical data (how data is presented to applications) and physical data (how it is stored on storage devices), which differentiates it from other data management tools.

Login

Field Name	Data Type	Size	Constraint	Description
userid	int	4	Foreign Key	User Identification no
username	varchar	20	Primary key	User Name
pwd	varchar	10	NOT NULL	password
status	int	2	NOT NULL	Status

Uregister

Field Name	Data Type	Size	Constraint	Description
uid	int	4	Primary key	User Identification
name	varchar	20	NOT NULL	Name
email	varchar	20	NOT NULL	Email ID
uname	varchar	20	Foreign key	Username
pwd	varchar	2	NOT NULL	Password
contact	varchar	6	NOT NULL	Contact

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country	varchar	12	NOT NULL	Country
address	varchar	20	NOT NULL	Address
location	varchar	50	NOT NULL	Location
pincode	varchar	20	NOT NULL	Pincode
dob	varchar	20	NOT NULL	Date of Birth
gender	varchar	20	NOT NULL	Gender
status	int	4	NOT NULL	status

Jobs

Field Name	Data Type	Size	Constraint	Description
pid	int	4	Primary key	Project Identification
cuname	varchar	20	Foreign key	Company Username
pname	varchar	100	NOT NULL	Project Name
pdetails	varchar	100	NOT NULL	Project Details
pskill	varchar	50	NOT NULL	Skill Required
pamount	varchar	6	NOT NULL	Amount
pdate	varchar	12	NOT NULL	Project Date
cdate	varchar	20	NOT NULL	Completion Date
jtype	varchar	50	NOT NULL	Job Type
tperiod	varchar	50	NOT NULL	Job period
status	int	4	NOT NULL	Status
location	varchar	20	NOT NULL	Location

Maildetails

Field Name	Data Type	Size	Constraint	Description
mid	int	4	Primary key	Message Identification
mdate	varchar	20	NOT NULL	Date
mfrom	varchar	20	Foreign key	Message sender username
mto	varchar	20	Foreign key	Message receiver username
subject	varchar	100	NOT NULL	Subject
attachement	varchar	100	NOT NULL	Attachement
message	varchar	100	NOT NULL	Message
status	int	4	NOT NULL	status

VI. FUTURE WORK

In the future, we plan to transition our system into a hybrid model that integrates bottom-up worker agency with top-down algorithmic mediation to enhance teamwork quality. While a purely top-down approach yielded average results and constrained worker agency in team formation, the hybrid model aims to address these limitations by fostering more effective collaboration. Our observations indicate that factors such as high-risk appetite, large population sizes, and elevated homophily thresholds among crowd workers positively influence teamwork quality in bottom-up approaches. This study advances our understanding of how self-organization impacts large-scale collaborative crowd innovation and informs the design of systems that incorporate both worker agency and algorithmic mediation in team formation.

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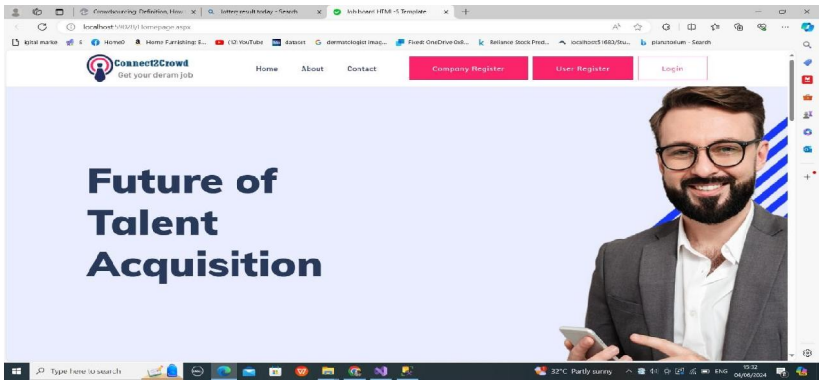
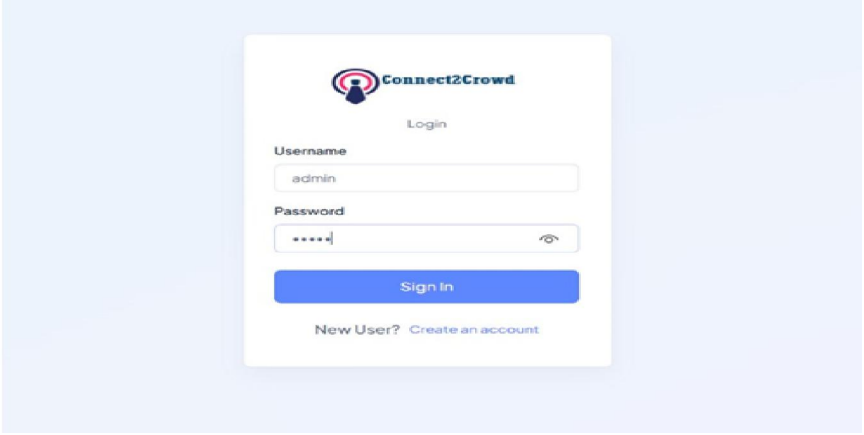
VII. RESULT

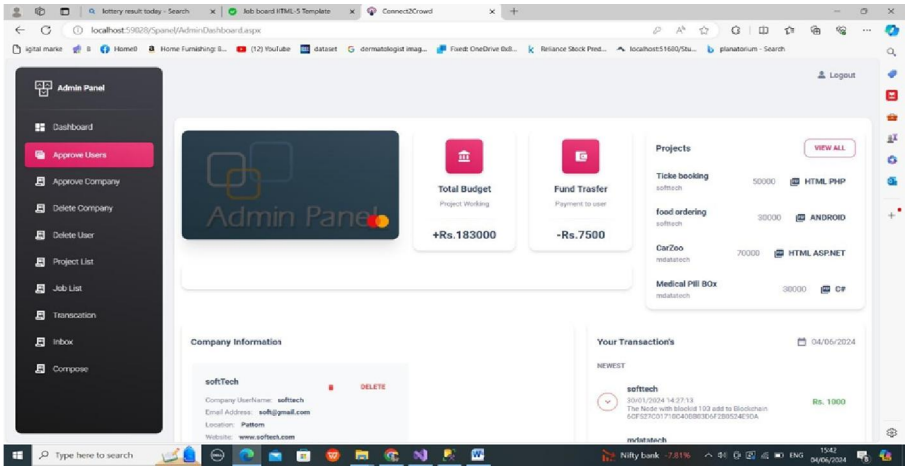
Home page



Login



Admin Panel



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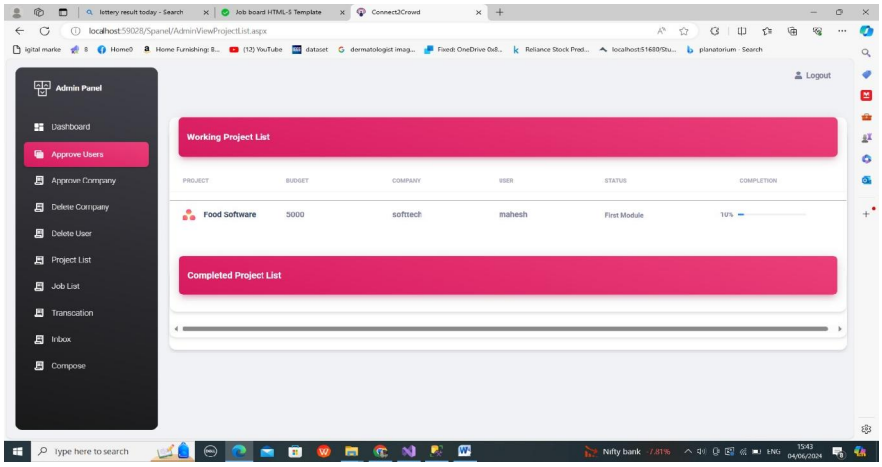
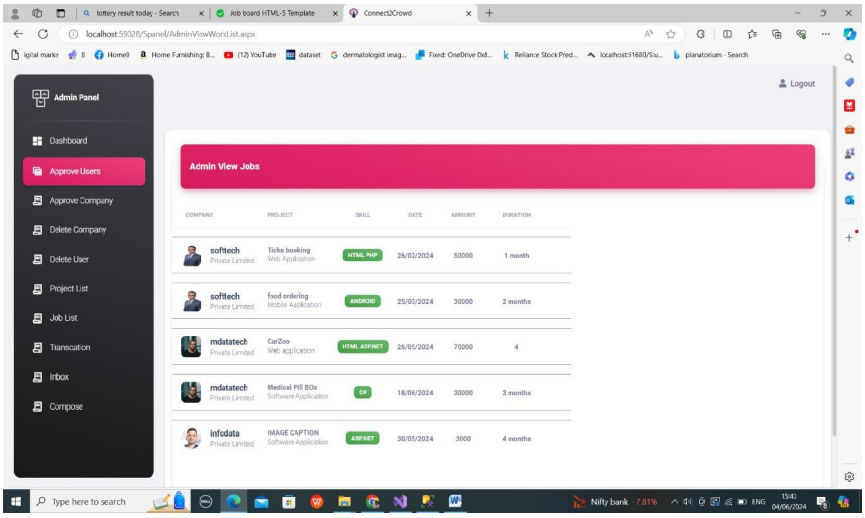
Project Status



Admin View Jobs



VIII. SUMMARY

In this project, we introduce a two-tiered social crowdsourcing architecture designed to address the issue of insufficient participation in online mobile crowdsourcing systems. This approach allows selected registered users to recruit additional participants from their social networks. We propose three system models for our two-tiered crowdsourcing framework, tailored to the availability of registered users and their social connections. Our evaluation mechanism leverages blockchain technology, benefiting from its inherent qualities of decentralization, transparency, traceability, and immutability, which provide greater resistance to attacks compared to centralized systems. Ensuring that workers receive fair and substantial rewards is crucial for maintaining their motivation to continue participating in crowdsourcing activities.

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