A DECENTRALISED CRICKET BETTING APPLICATION USING ETHEREUM BLOCKCHAIN

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ABSTRACT

This is an idea proposed to improve modern cricket betting platform which involves introducing the use of cryptocurrency as an alternative for traditional methods involving cash. The basic idea of this application is to provide decentralization platform where users can bet in peer-to-peer based. Also it is more secured since there is no middle party hinderance. In order to use the application, users need to have metamask extension. Each user is identified by their own hash address that is generated uniquely. Users can bet using ETH (Ethereum) as assets. The entire project is using Blockchain technology. Backend is built using Solidity language and frontend is built using NodeJS. Web3.js API is used to interact with the backend. Ganache framework is used to develop, deploy and test the dApps.

Keywords— Blockchain, Cryptocurrency, Ether, In-play, Decentralized, Solidity.

I. INTRODUCTION

Unlike many cricket betting platforms that use traditional currency, cryptocurrency based platforms found to be more benfiting as it is highly secured and decentralized. Cryptocurrency is a digital payment system that doesn't rely on banks to verify transactions. It’s a peer-to-peer system that can enable anyone anywhere to send and receive payments. Instead of being physical money carried around and exchanged in the real world, cryptocurrency payments exist purely as digital entries to an online database describing specific transactions. When you transfer cryptocurrency funds, the transactions are recorded in a public ledger. Cryptocurrency is stored in digital wallets. Cryptocurrencies run on a distributed public ledger called blockchain, a record of all transactions updated and held by currency holders. Units of cryptocurrency are created through a process called mining, which involves using computer power to solve complicated mathematical problems that generate coins. One of the example for cryptocurrency is Ethereum. Ethereum is a blockchain platform with its own cryptocurrency, called Ether (ETH) or Ethereum. It is the most popular cryptocurrency after Bitcoin.

II. LITERATURE SURVEY

1. **[2019] Decentralised Applications Using Ethereum Blockchain,** R Aroul Cannessane, Ashwini Singh, N Srinivasan, Abhinash Beuria, and B Muthu Kumar.

   Blockchain is a zero trust network and this makes it a very powerful tool for various services provided that people are ready to believe and invest in it. In the Ethereum world, the blockchain runs on smart contracts which are self-executing applications that come at a cost of security. This zero trust network is capable of replacing many of the debated process or activities in our day to day life. One of our biggest concerns is an E-voting system which must be secure. Blockchain being an immutable and append only ledger will not allow for any tampering while also being fully transparent. In this paper, they have implemented and tested a sample e-voting app running as a smart contract for ethereum network using E-Wallets. After an election is held, eventually, the ethereum blockchain will hold the records of ballots and voters thus giving a clear and trusty network where mishandling is to a minimum.

2. **[2018] A Decentralized Marketplace Application on The Ethereum Blockchain,** R.Vishnu Prasad, Ram Dantu, Aditya Paul, Paula Mears.

   Modern centralized online marketplaces such as eBay offer an alternative option for consumers to both sell and purchase goods with relative ease. However, drawbacks to these marketplaces include the platform's ability to block merchants at their own whim, the fees paid to the platform when listing a product and when selling a product, and the lack of privacy of users' data. In this paper, they have proposed an application that remedies all three of these drawbacks through use of the Ethereum blockchain platform. The application was developed using the Truffle development framework. The application's functions were contained within an Ethereum smart contract, which was then migrated to the Ethereum network. The user's input was read through a web interface and sent to the Ethereum network via the web3.js API. Statistics about the application were gathered on the Rinkeby test network.

3. **[2018] Towards Secure E-Voting Using Ethereum Blockchain**

   The blockchain with the smart contracts, emerges as a good candidate to use in developments of safer, cheaper, more secure, more transparent, and easier-to-use evoting systems. Ethereum and its network is one of the most suitable ones, due to its consistency, widespread use, and provision of smart contracts logic. An e-voting system must be secure, as it should not allow duplicated votes and be fully transparent, while protecting the privacy of the attendees. In this paper, they have implemented and tested a sample e-voting application as a smart contract for the Ethereum network using the Ethereum wallets and the Solidity language. Android platform is also considered to allow voting for people who do not have an Ethereum wallet. After an election is held, eventually, the Ethereum blockchain will hold the records of ballots and votes. Users can submit their votes via an Android device or directly from their Ethereum wallets, and these transaction requests are handled with the consensus of every single Ethereum node. This consensus creates a transparent environment for e-voting.

4. **[2018] In-Play Sports Betting: a Scoping Study,** Elizabeth A. Killick & Mark D. Griffiths.

   Technology has changed the nature of gambling practices over the last decade and is continuing to do so. The online sports betting industry has become a rapidly growing sector of the global economy, with online sports betting contributing 37% of the annual online gambling market in Europe. There has been an integration of social and technological processes that has enabled the cultural saliency of contemporary online betting. One of the more newly introduced forms of online sports betting is in-play sports betting behaviour (the betting on events

within a sporting event such as football and cricket). In-play sports betting features (such as 'cash out') are increasing in popularity amongst online gambling operators. A scoping study was carried out examining the evolution of this new form of gambling practice which included both a systematic literature review and the examination of 338 online gambling websites that offered sports betting. The present study identified a comprehensive list of what in-play betting features are currently being offered on online gambling websites as well as other information concerning in-play sports betting.

5. **[2018] Block Sports: A decentralized sports betting exchange,** Mirren KingSmith, Tsering Redmond, Sergej Stojanovski.

   A sports betting exchange is a marketplace for the trade of sporting outcomes. Unlike a traditional sports betting platform, a sports betting exchange eliminates the need for a central bookkeeper and instead enables users to place bets against one another. This paper details Block Sports, a decentralized sports betting exchange that approaches the concept of a blockchain-native sports betting platform with two key objectives — creating a decentralized and trusted framework for sports betting and providing a rich user experience through an off-chain service layer. Utilizing the Neo blockchain, a solution is proposed which integrates a decentralized oracle consensus network with a series of smart contracts, allowing users to place bets on sporting outcomes with NeoGas (GAS). The result is a platform that solves the issue of counterparty risk while still remaining competitive with traditional sports betting exchanges.

III. PROPOSED TECHNIQUE

A. SYSTEM ARCHITECTURE

User interacting with the frontend requests the page. The response is sent back to user through interacting with the backend which is in-turn connected with the database. Ui and backend is designed using Node.js and Solidity language respectively. Front-end and back-end interactions is done using Web3.js API. System architecture is shown in fig 3.1 below.

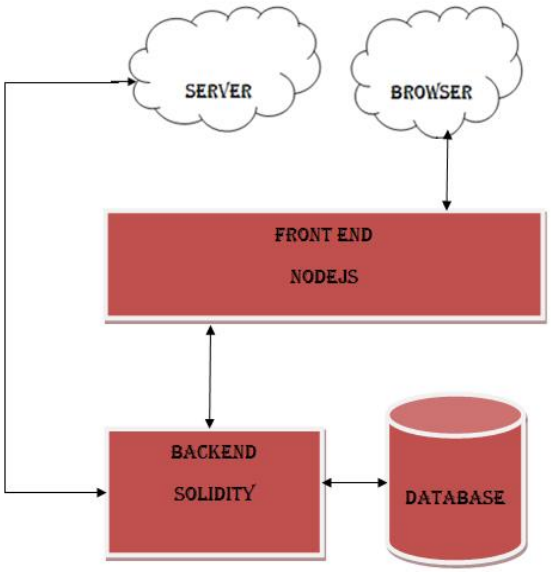
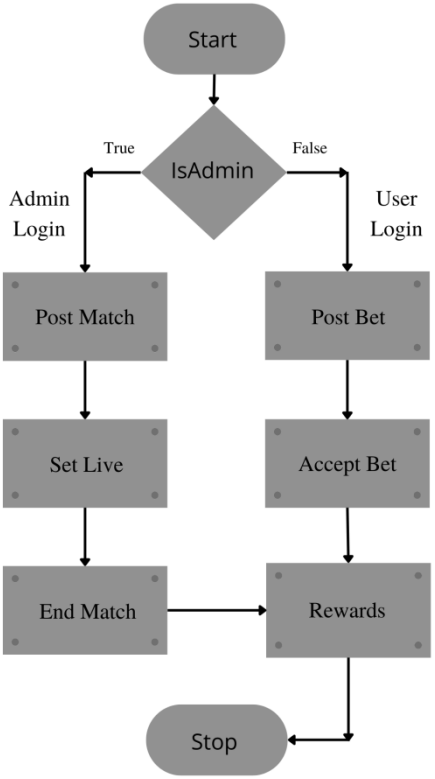


Fig 3.1 System Architecture

B. FLOWCHART



Whenever a person logins, conditions are checked for admin or user. If the person is admin, he has the option to post the match, change the state of match at any given point of time and declare the match. He doesn't have any authority to control the user interactions. If the user logins, he has the option to post bets specifying his and opponent entry fee, accept one or more bets. Initially match will be posted in upcoming section. Once the match starts, it is set to live. Users can bet while match is in live i.e, it allows for in-play betting. Each transaction in the blockchain incurs a gas fee. These are held in smart contracts. If the user wins, he gets rewarded and the amount will go into his wallet. If the match is a draw then each person gets his amount returned. Admin gets a minute amount of gas fee in these transactions. The flow is shown in fig 3.2

Fig 3.2: Event Flow

IV. RESULT AND DISCUSSION

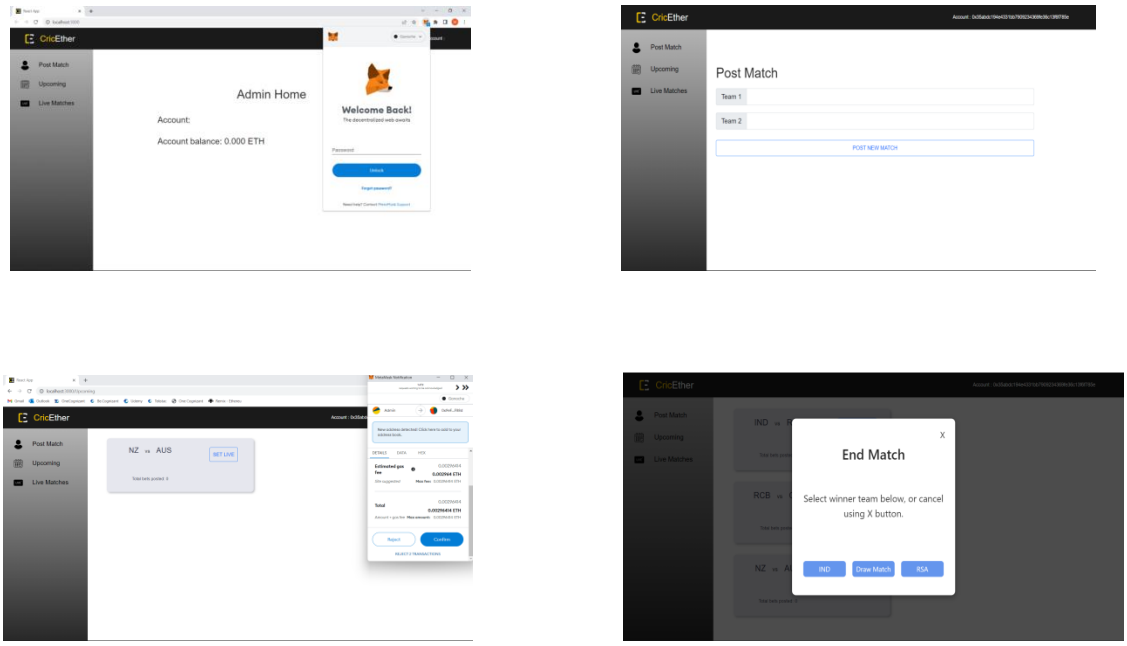


Fig 4.1 Admin Operations

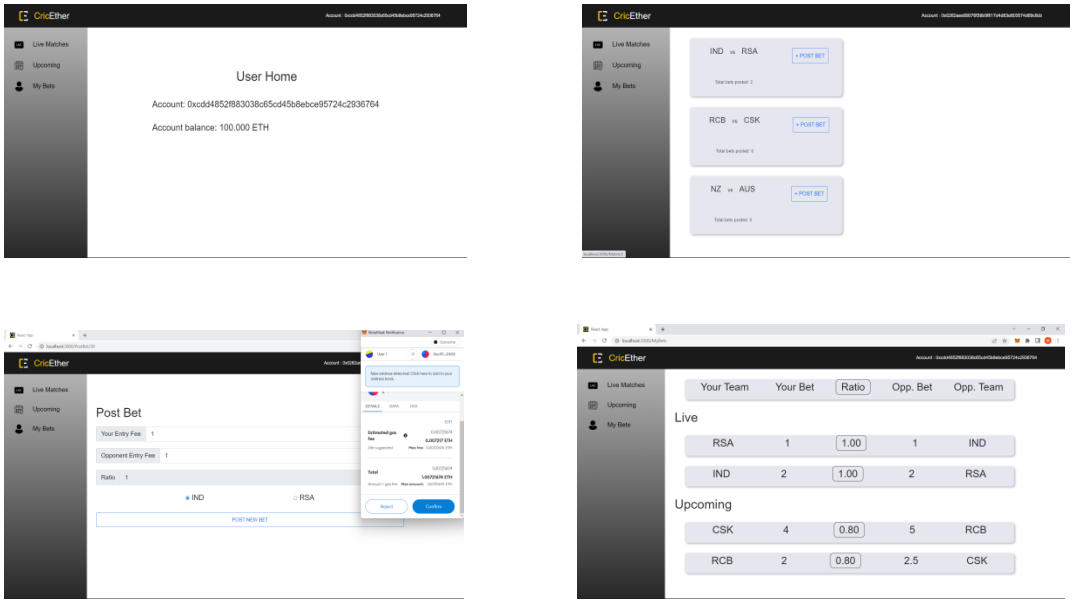


Fig 4.2 User Operations

V. CONCLUSION AND FUTURE SCOPE

We created a sports betting system which allows in-play betting. It eliminates the hinderance of the third party thus providing a peer-to-peer platform. By transition to web3.js it promotes decentralization.

FUTURE SCOPE

- Include multiple fields related to match.
- Include different games and sports events.
- Develop proprietary ERC-20 token.

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