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DECENTRALIZED EVENT TICKETING SYSTEM USING BLOCKCHAIN TECHNOLOGY

By

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APPROVAL FOR BLOCKCHAIN MINI-PROJECT REPORT FOR FINAL YEAR SEMESTER VIII

BLOCKCHAIN LAB

This project report entitled **decentralized event ticketing using blockchain technology** by Jainam Chheda, Hrishika Singh, Shrushti Thakur, is approved in partial fulfillment of the requirement for the BLOCKCHAIN Lab of Final Year Engineering.

Examiners

1._____

2. _____

Guide

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Date:

Abstract

The decentralized event ticketing blockchain application is designed to revolutionize event management and ticketing through Ethereum smart contracts. It enables users to create events with specific details like name, date, ticket price, and availability, ensuring future event dates and positive ticket counts. Participants can securely purchase tickets using Ether, with the system verifying ticket availability and event validity. Additionally, ticket owners have the flexibility to transfer tickets to other Ethereum addresses, enhancing user autonomy. Utilizing a structured Event struct and mappings for event and ticket management, this application offers transparency, security, and efficiency, eliminating the need for intermediaries and paving the way for trustless interactions in event ticketing.

Contents

List of Figures

Chapter 1
Introduction

1.1 Introduction to Domain/Area and Motivation

In today's world ineffective event management procedures, a lack of transparency in ticket sales and event information, security flaws, and technological impediments for non-technical users are some of the problems that event organizers today face. Current event management procedures are ineffective and opaque, and they pose security risks and technological obstacles. We suggest the building of a thorough smart contract system to address these problems by giving event planners the instruments they require to speed up the planning of events, the selling of tickets, and secure transactions while maintaining accountability and confidence in the system.

The use of blockchain technology and smart contracts gives a chance to revolutionize the fast changing environment of event planning and attendance. Our project seeks to provide a user-friendly smart contract system that enables event planners to easily arrange events, manage ticket sales, guarantee safe transactions, and offer clear event-related information in order to address these problems. With the aim of revolutionizing the way events are handled, this project aims to build a strong and user-friendly smart contract system using the React Truffle Box and Solidity programming.

Additionally, by enabling participants to quickly access event-related information, this technology will improve their entire event experience. By the project's conclusion, we envisage a paradigm change in the event management sector, one that offers more effective, safe, and transparent event organization and attendance, creating a situation where both event organizers and attendees benefit.

1.2 Problem Statement

In today's event ticketing ecosystem,Centralized ticketing platforms face challenges like lack of transparency, making it hard for attendees to verify ticket legitimacy and seat availability. This opacity erodes trust and causes frustration among event-goers. Additionally, these systems are susceptible to ticket scalping and fraud, with scalpers reselling tickets at inflated prices, leading to higher costs for attendees and revenue loss for organizers. Counterfeit tickets further threaten event integrity by risking denied entry and disruptions. Moreover, high transaction fees imposed by intermediaries increase costs for organizers and attendees, reducing ticket affordability and potentially deterring interested attendees.

1.3 Proposed Solution

A blockchain-based decentralized event ticketing system offers a promising solution to these challenges. By using blockchain technology, event organizers can create a clear and unchangeable record of event details, including ticket availability, prices, and ownership. This transparency builds trust among attendees, who can verify ticket authenticity and ensure fair ticket distribution. Smart contracts on a blockchain enable secure and tamper-proof ticket transactions. Attendees can buy tickets directly from organizers without middlemen, reducing the risk of scalping and ensuring fair pricing. Additionally, ticket transfers between individuals can be done securely through blockchain technology, preventing counterfeit tickets and unauthorized reselling. Adopting a blockchain-based ticketing system also cuts costs by bypassing middlemen and reducing transaction fees. This cost efficiency makes tickets more affordable for attendees while still supporting event organizers financially.

1.4 Organization of the Report

The rest of the report is organized as follows. Chapter 2 presents the summary of the literature review carried out. Chapter 3 discusses the system design of the proposed model. In Chapter 4, we present the results and implementation steps for the system. And finally, Chapter 5 includes the conclusion followed by references.
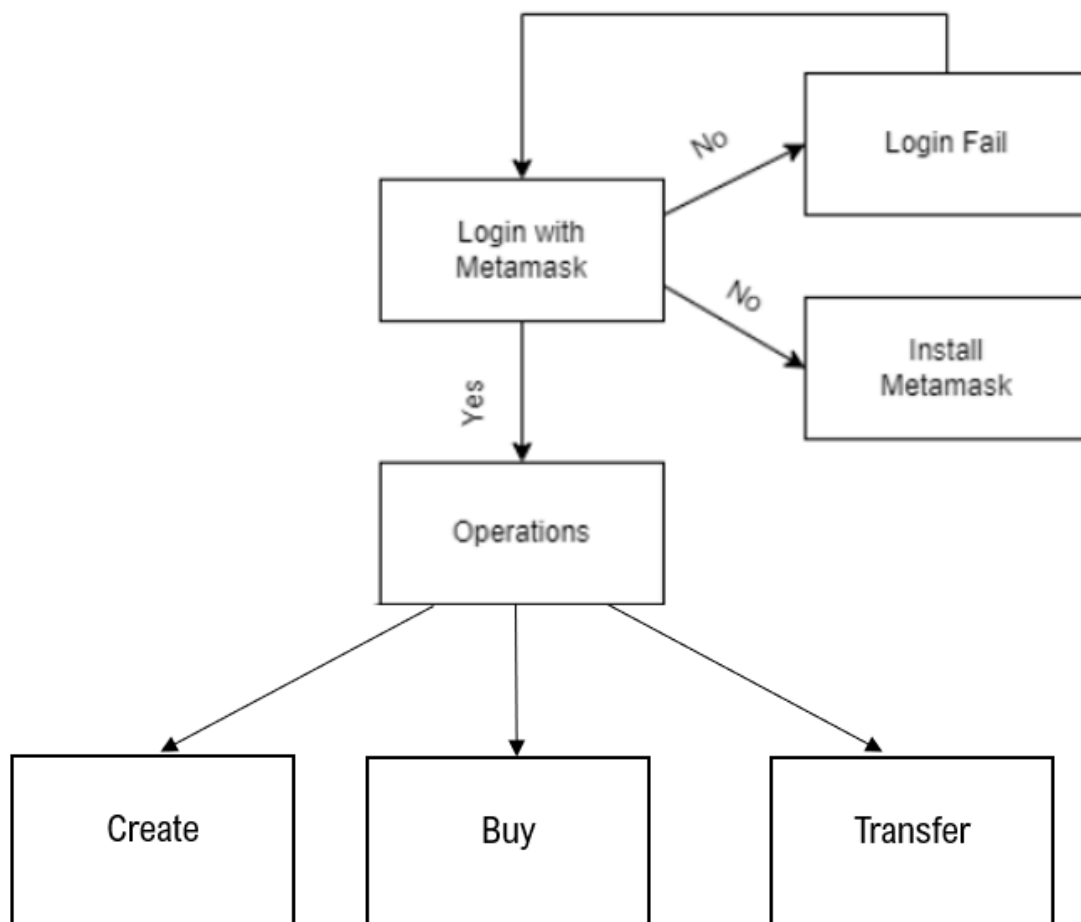
Chapter 2
System design

Fig 1: System Design

The above diagram Fig 1 shows the system design of the Decentralized ticketing system.
The user needs to be logged in with the metamask in order to carry out the ticketing operations. Once the user is successfully logged in he/she will be able to carry out the three ticketing operations such as Create, Buy and Transfer

Software Requirements
Software:
1) VsCode

2) Ganache.

3) Truffle

4) Metamask.

5) Node Package Manager.

6) Windows 10 and above.

Application Areas of Project
- Decentralized event ticketing system is used to remove third parties and centralized institutions from ticket scalping.
- Effective ticket Management
- Compliance and KYT
- Decentralized Autonomous Organizations(DAOs)
- Secure Transactions
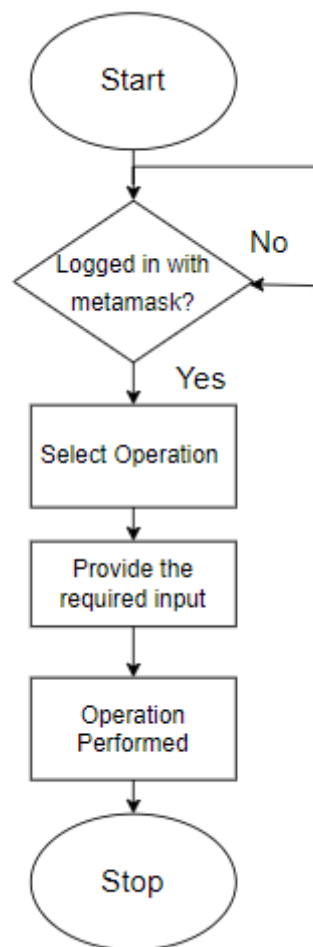- Travel ticket bookings
- Predicting Market

Chapter 3
Implementation and results

Flowchart

Fig 2: Flowchart of implementation

In Fig 2
The user needs to log in with a metamask in order to carry out the ticketing functionalities. Once logged in, he/she will be able to select the required operation. After the operation is selected, the user needs to provide the input to get the operation performed.

Code:

EventContract.sol

```solidity
// SPDX-License-Identifier: Unlicense
pragma solidity >=0.5.0 <0.9.0;

contract EventContract {
    struct Event {
        address organizer;
        string name;
        uint date;
        uint price;
        uint ticketCount;
        uint ticketRemain;
    }

    mapping(uint => Event) public events;
    mapping(address => mapping(uint => uint)) public tickets;
    uint public nextId;

    function createEvent(
        string calldata name,
        uint date,
        uint price,
        uint ticketCount
    ) external {
        require(date > block.timestamp, "Event date must be in the future");
        require(ticketCount > 0, "Ticket count must be greater than 0");

        events[nextId] = Event(
            msg.sender,
            name,
            date,
            price,
            ticketCount,
            ticketCount
        );
```

```solidity
        nextId++;
    }

    function buyTicket(uint id, uint quantity) external payable {
        require(events[id].date != 0, "Event does not exist");
        require(block.timestamp < events[id].date, "Event has already occurred");

        Event storage _event = events[id];
        uint totalCost = _event.price * quantity;

        require(msg.value >= totalCost, "Insufficient Ether sent");
        require(_event.ticketRemain >= quantity, "Not enough tickets available");

        _event.ticketRemain -= quantity;
        tickets[msg.sender][id] += quantity;
    }

    function transferTicket(uint256 id, uint256 quantity, address to) external {
    require(events[id].date != 0, "Event does not exist");
    require(block.timestamp < events[id].date, "Event has already occurred");
    require(tickets[msg.sender][id] >= quantity, "Insufficient tickets owned");

    uint256 senderTickets = tickets[msg.sender][id];
    require(senderTickets >= quantity, "Insufficient tickets owned");

    // Transfer the tickets
    tickets[msg.sender][id] -= quantity;
    tickets[to][id] += quantity;
}
}
```

Output:

Fig 3: Interface of the Decentralized Ticketing System where the user can carry out the ticketing operations
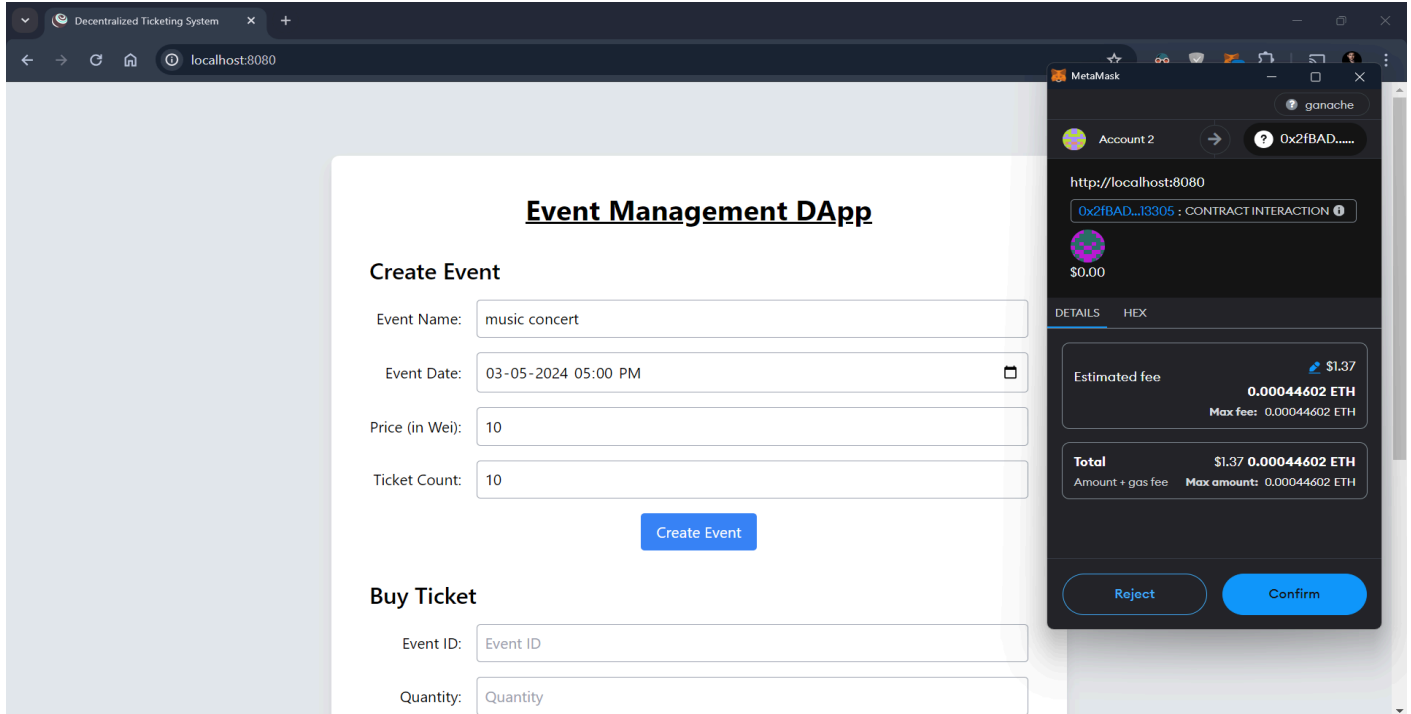
Fig 4: Shows how organizers can create events
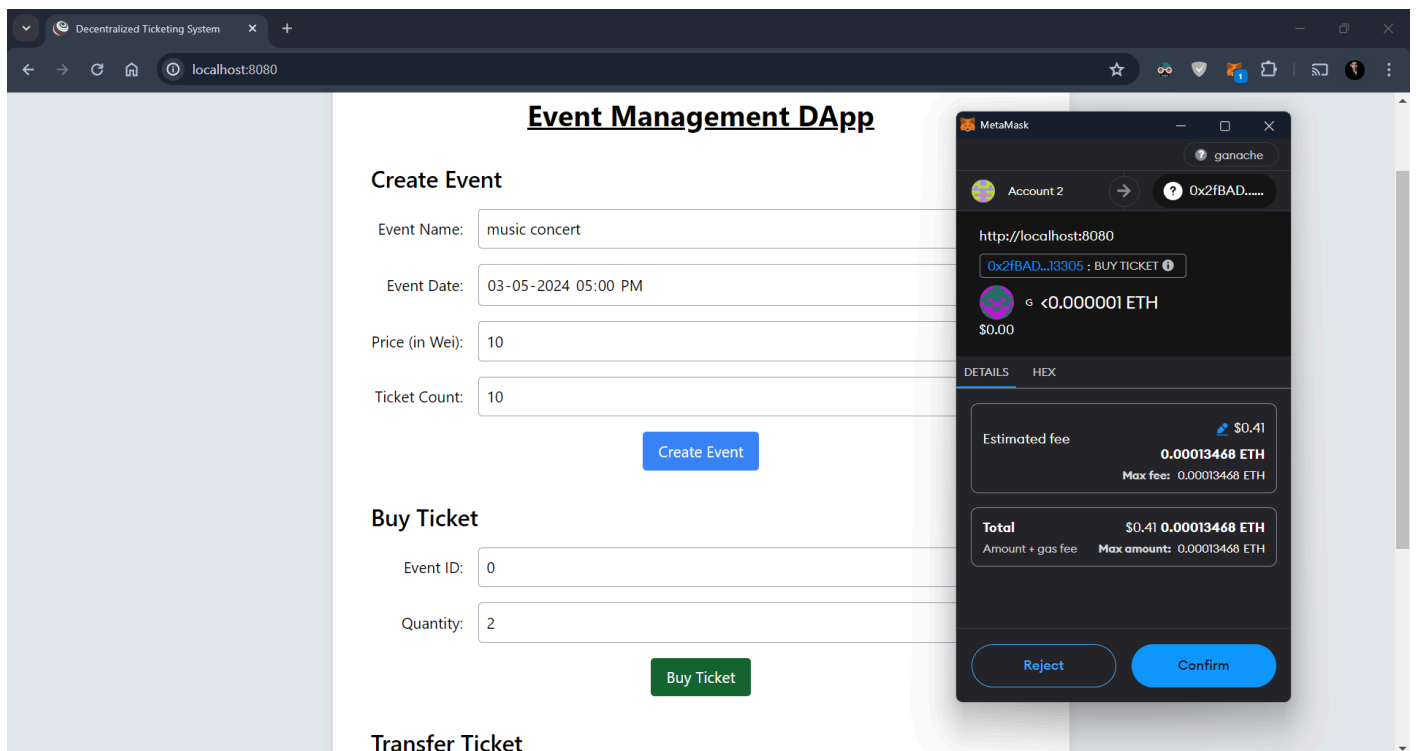
Fig 5: Illustrates the process through which users can purchase event tickets based on the available quantity.

Fig 6: Illustrates the process through which users can transfer event tickets to other users/clients.

Fig 7: Shows transactions done via multiple accounts

Chapter 4
Conclusion

In conclusion, by offering a cutting-edge smart contract system created using Solidity programming language and React Truffle Box the project has effectively handled the important difficulties in event management. This technology delivers an unparalleled degree of speed and transparency for event organizers by expediting event development, ticket sales, and safe transactions.

As a consequence, event attendees will have a better experience since they can immediately obtain crucial event information. This method lowers technical obstacles with a user-friendly interface, opening it up to a larger audience. This initiative has the potential to change more than just the field of event planning. It promises to revolutionize the sector and usher in a new era of simplicity, security, and trust that will eventually benefit all stakeholders.

By achieving our goals, this initiative adds to the larger ambition of utilizing blockchain technology for clear and effective solutions across a range of industries. Now that blockchain solutions are more widely used, event management is ready to become more dependable and fun, setting a new benchmark for the sector and offering a potent case study.

Acknowledgement

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