Journal of Informatics and Web Engineering
Vol. 3 No. 2 (June 2024) eISSN: 2821-370X

Secure Room-Sharing Decentralized App Development on Ethereum Block Chain Using Smart Contracts

Hasnain Raza[1], Reqad Ali[2], Jawaid Iqbal[3,*] and Muhammad Awais[2]

[1] Institute of Management and Science Peshawar, Pakistan
[2] Capital University of Science and Technology Islamabad, Pakistan
[3] Riphah International University Islamabad, Pakistan
Corresponding author: (jawaid.iqbal@riphah.edu.pk, ORCiD: 0000-0002-5045-7485)

Abstract - The purpose of this research is to analyze whether Blockchain technology can affect the share-economy. Apart from that, blockchain technology has been innovating the whole of the industries and so the academics are discovering the possibilities and starting to incorporate them in order to provide additional tech possibilities. The sharing economic system is the system which enables to share asset among the one person to the other person. It has seen the remarkable growth in the last few years, Uber, Careem, Airbnb, Zostel, Hostel World are some companies to mention which have fueled this growth. Yet, the majority of the transactions through the sharing economy system are facilitated by a centralized infrastructure executing an intermediary role that might be vulnerable to issues of hacking and data breach and such operations come at a high cost and expending more effort in keeping the system active is also a factor worth mentioning. A different method which is free of control centers such as the peer-to-peer sharing and smart service model which is being implemented in the Hospitality industry can overcome those obstacles. Through the use of a blockchain-backed payment system based on an accommodation-sharing structure, the research will develop a prototype of the proposed system in the form of a DApp on the Ethereum blockchain. The aim of these studies and research is to inform the public about the revolution that is blockchain and its benefits for trade, technology, business, and daily life.

Keywords— Blockchain, smart contract, DApp, Ethereum, sharing economy, smart city

Received: 29 October 2023; Accepted: 11 April 2024; Published: 16 June 2024

I. INTRODUCTION

A. Background

For the past few years, blockchain has revolutionized every business, prompting academics to investigate its potential for delivering remarkable services. Crowdfunding, insurance, supply chains, digital currencies, and healthcare are just a few of the major areas where blockchain is making significant progress. In recent years, the peer-to-peer economy has experienced rapid growth [1, 2]. Airbnb, Zostel, Hostelworld, Careem, Uber, and Ola are just a few examples of this growth [3]. The sharing economy allows people to share their assets with others who need them, eliminating waste and encouraging participation. However, the majority of economy-sharing transactions take place on centralized infrastructure involving a third party and external resources. The centralized model of transactions is vulnerable to

Journal of Informatics and Web Engineering
https://doi.org/10.33093/jiwe.2024.3.2.11

Published by MMU Press. URL: https://journals.mmupress.com/jiwe

dangers such as password hacking and consumer data misuse, and it is more expensive and requires more effort to maintain. Having a centralized system for accommodation-sharing services has many shortcomings, such as surge fees, GST, and payment gateway fees. Therefore, creative ways are needed. One option to counter the drawbacks of the centralized system is through a decentralized strategy, such as the peer-to-peer approach used in the accommodation-sharing process. The agenda of this paper is to deliver knowledge of the blockchain revolution and its application in our daily lives. The research will deliver two main objectives:

i. To construct a model of the proposed architecture as a decentralized application (DApp) in Ethereum.
ii. To set out safe and secure room-sharing system architecture based on blockchain.

Many research several research analyses have been carried out on blockchain-based sharing economy platforms. A 2022 analysis published by the World Economic Forum and the analysis showed that the blockchain technology have $1.76 trillion of industry power and potential till 2027 to the global economy with the main portion of this value created by the sharing economy [4].

Alternative study, published in the journal Nature in 2021, which summarize that blockchain can assists the users, organizations and shared economy platform to improve their security, tracking and accountability. The research found that blockchain can take the responsibility of supply chain product by having tracks and movement of each product and services. It can support to reduce fraud and theft, and it can also help to improve the security of services provided on sharing economy platforms [5].

As per the survey [20], blockchain is giving 24/7 security inspections to houses, devices and Apps/Webs and it prevents the un authorized access to devices and houses. It also takes the accountability of securing data and gives you full control over your device. And it could even make your supply chains transparent, so you know exactly where your products come from and how they're handled.

Blockchain and AI forge a revolutionary alliance [21], With your secure medical ledger on the blockchain, research unlocks a treasure trove of data. No longer chained to siloed records, doctors and scientists can weave intricate tapestries of health trends, predicting epidemics before they bloom, tailoring treatments to fit your unique genetic tapestry, and propelling medical advancements at a dizzying pace.

Blockchain technology has a wide range of applications in the Internet of Things (IoT), governments, and businesses shown in Table 1.[1].

Table 1. Exploring the Role of Blockchain Across Different Industries [1]

Field	**Applications of Blockchain**	**Specific examples**
IoT	Secure and temper-prove records of IoT device data.	Tracking the movement of goods through a supply chain.
Government	Secure and temper-prove records of government transactions.	E-Voting and land registration
Business	Secure and temper-prove records of Business transactions.	Contracts, Payments, and Supply chain management.
AI	Secure, Best Prediction and Data-Driven records.	Secure AI systems i-e AI Bots and Recommendation systems[21].

B. Blockchain

Blockchain is a distributed software network that operates on a digital ledger to enable secure asset transfers between blocks without the use of a third party. It is similar to the internet, which allows the flow of digital information to each computer. The digital ledger is a database architecture that uses a decentralized and secure mechanism to store data in blocks that contain critical data or transactions. The platform is based on a peer-to-peer network ledger, which is derived from the underlying technology used in Bitcoin [6]. Blockchain have many prominent characteristics, such as it is decentralized, immutable, distributed and have shared nature and these characteristics gives blockchain growing success. Every network participant checks and verify the transaction in blockchain network. As we already know that blockchain operates on peer-to-peer mechanism so therefore no any central, intermediate and third parties' resources are required for any process. A smart city system uses cloud computing and other informational technology in order to keep their processes align, blockchain is the best resource in order to keep track of each and every information that is sent or received. [7]. The merging of blockchain technology in smart city can boost the performance, security and efficiency and intelligence. Blockchain is the most widely used distributed ledger technology. The information and data is managed into a series of connected blocks with each other. There are three types of blockchain systems: consortium, private, and public [6]. Anyone on the network can view, create, and validate transactions on a public blockchain, and anyone can also maintain the shared ledger. Public blockchain examples include Bitcoin and Ethereum. In contrast, a private blockchain is controlled by a single entity and is a decentralized yet centralized network. A consortium blockchain is a private network that manages cross-organizational transactions. With the metaverse rapidly becoming a cornerstone of social interaction and virtual experiences, concerns loom over securing digital content and data within this nascent realm [19]. Fortunately, blockchain, renowned for its decentralized, immutable, and transparent nature, emerges as a beacon of hope.

C. Ethereum

Ethereum is a public and permissionless blockchain platform introduced by Vitalik Buterin. It is developed using the Turing-complete programming language Solidity, which overcomes some of the limitations of Bitcoin's scripting language. Smart contracts are used to execute transactions on Ethereum. Smart contracts are self-executing contracts that automatically carry out a set of predefined rules when certain conditions are met [8]. Ethereum transactions are cryptographically signed orders, and the native cryptocurrency of Ethereum is called Ether. In addition to being used for payments, Ether is also used as a fee to run decentralized applications (DApps) on the platform. These instructions are executed by the Ethereum Virtual Machine (EVM), which runs on every node in the network. Ethereum has a wide range of potential applications, including insurance, file storage, market forecasting, and fintech. A recent study found cracks in Ethereum's contracts, opening doors for thieves and big losses. Time to tighten security in detection tools, prevention measures, and even the tools used to check if everything's okay[18].

D. Smart Contract

Smart contracts are computer programs that are stored on a blockchain and execute automatically when certain conditions are met. Smart contracts are used to make limitations. Based on the Ethereum blockchain, a smart contract is a cryptographic package that accepts and processes inputs, produces outputs, and stores data. The outputs are only accessible to the public under certain conditions [9]. In their Safe Smart Contract study, Kevin Delmolino et al. provide a step-by-step process for constructing a smart contract [10]. Smart contracts are written in high-level programming languages such as Solidity and then compiled into bytecode, which is a low-level machine code that can be executed by the Ethereum Virtual Machine (EVM). The bytecode is then stored on the blockchain, and the EVM executes it whenever a transaction is sent to the smart contract address. Ethereum was the first coin that introduced smart contracts. Ethereum uses an Ethereum virtual machine to make the smart contract writing smart contracts Download Meta-mask, Select any test network (Protocols), Add some ether value to your wallet, and Use remix browser that is developed by Ethereum in which anyone can code the Contracts, Make that sol extension, Then test your smart contract, Lastly, deploy your contract using the deploy button. The foundation of decentralized apps is smart contracts. Solidity is the most widely used programming language for smart contract development. It is a high-level language that is influenced by C++, JavaScript, and Python. Solidity code can now be executed as decentralized applications on the blockchain. Smart contracts are the backbone of decentralized applications. [10]. Overall, smart contracts are a double-edged sword in the world of cryptocurrency transactions. While they increase efficiency, security, and automation, their influence on volatility presents both opportunities and risks for investors and the wider crypto community[17].

E. Decentralized Applications (DApps)

A DApp is a Blockchain-based program that runs on a decentralized, P2P infrastructure, rather than a centralized server. A peer-to-peer network is one in which two participants interact or share information without the intervention of a central authority. Cryptography is used to safeguard the transactions. To protect transactions, cryptography is utilized to secure communication between two blocks from third-party sources. The Encryption algorithm is used in cryptography to convert the original message to cipher text, which is subsequently converted back to the original text after receiving. Ethereum hosted DApp on different domains such as energy, insurance, supply chain, health, and other area. Most of the Apps are semi-decentralized. The features of a DApp are detailed as follows [11].

i. DApp codes are publicly accessible and open for modifications, which means a third-party audit is feasible.
ii. Due to the general decentralized nature of DApps, there is no single point of failure possible.
iii. Coordination among the nodes is required to provide transparency.
iv. One of the main drivers of the ecosystem of decentralized applications is internal crypto money.

A comparison of the key distinctions between centralized and decentralized blockchain applications can be found in Table 2 below [12].

Table 2. Side-by-Side Comparison: Centralized versus Decentralized Applications [1]

Centralized Application	**Decentralized Application**
A DApp operates using a client-server architecture.	Smart contracts are used by clients to interact with the application.
A database that clients can access and is connected to the backend server.	A decentralized peer-to-peer network is where the backend code operates.
The need for a central direction to establish roles and permissions.	No central direction and authority.
Concerns are raised over security and privacy.	Secured, unchanging, and self-governing.

F. DApp Architecture

DApps have a two-tiered design, consisting of a front-end client-side application and a back-end server-side application, where the smart contract is implemented. The communication and coordination between a client-side program and a server-side program are depicted in Figure. 1, along with the overall structure of the decentralized system. The following sections of this article detail the technologies that were used to create the room-sharing DApp [22].

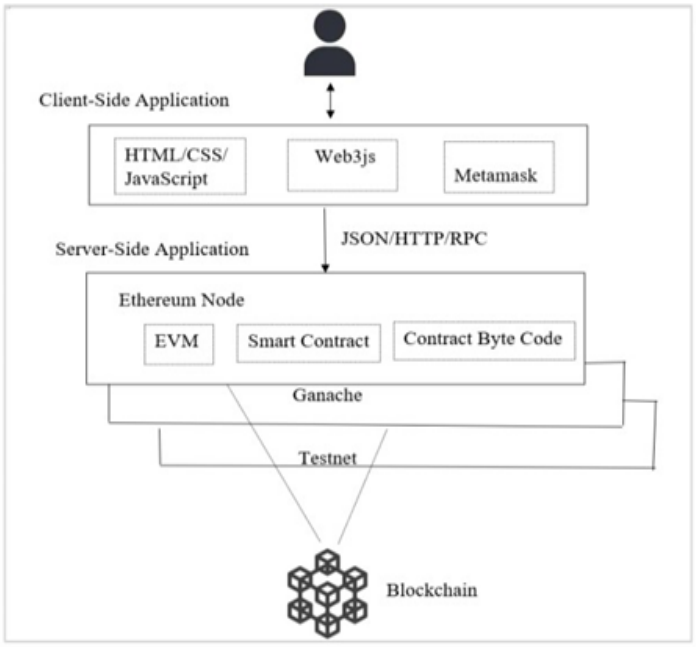

Figure 1. This Graphical Representation Showcases the Structure of a Decentralized Application (DApp) Developed on The Ethereum Blockchain

A DApp has both a front-end and back-end component, as shown in Figure 1. In contrast to centralized applications, where the back-end code is run on centralized servers, a DApp's back-end code is distributed throughout a peer-to-peer decentralized network. Any programming language Like Flutter and React can be used to create a DApp's front-end code, which will communicate with the back-end through API calls [23].

The first blockchain technology to create a framework for building smart contracts and decentralized apps was Ethereum (DApps). The standard programming language for creating DApps on the Ethereum platform is SOLIDITY.

The Truffle suite, which makes the process of developing, building, publishing, and verifying smart contracts simple, was used to build the decentralized application (DApp). It also makes it easier to construct the DApp's front-end user interface design. The Truffle framework, a development environment where smart contracts are created, tested, and implemented, is one of the three key components of the Truffle suite. The front-end library Drizzle is used for DApp development. The simulation tool Ganache (GUI) can be used to create and test the DApp's graphical user interface.

The client-side application uses HTML, CSS, and JavaScript, similar to a regular web application. A collection of frameworks known as Web3.js facilitates communication between DApps and blockchains. Additionally, it helps move ether between accounts and access data from blockchains and smart contracts. In our project, we used MetaMask, a browser plugin with a Web 3.0 provider that allows users to safely store their private keys and Ethereum accounts.

The Ethereum Virtual Machine (EVM) is responsible for data manipulation in Ethereum. It has its own programming language called EVM bytecode. To write the code, high-level programming languages are used. These are contract-oriented languages created specifically for Ethereum, such as Solidity, Viper, Flint, and Bamboo. Every node in an Ethereum network runs an EVM, which is responsible for executing the same smart contract instructions across the entire Ethereum network.

II. LITERATURE REVIEW

A. Existing Centralized Model of Room Sharing Platform

Pricing Companies like Airbnb and Hostel World, both of which facilitate transactions between hosts and users. They assist consumers in making secure payments and selecting rooms and flats with flexibility. This establishes a reliance

between the user and the host, and what happens if the payment gateway firm raises its prices? According to the [12], these middlemen charge clients 10-20% more than the real charges.

Privacy and Security According to [12] centralized apps like Airbnb and Uber etc, employ algorithmic predictions to determine how much clients are prepared to pay for additional services, which is a major security risk. Furthermore, storing all client information on centralized servers invites hackers to launch a variety of assaults.

Lack of Transparency Most room-share businesses use rising pricing models, in which they charge customers a high rate based on demand, particularly in major cities. The vast majority of clients have no idea how these activities work. Between customers and enterprises, there is no transparency [12].

Safety and standards Safety is currently the biggest problem that users of Airbnb, Hostel World, or any other room-sharing platform encounter. Both the host and the user's safety are in danger. Despite investing a sizable sum in background check procedures, this issue still exists. Fig. 4. Below illustrates the operation of the centralized room-sharing scheme. Figure 2 depicts the workflow in the centralized storage approach. The stages of the procedure are listed below.

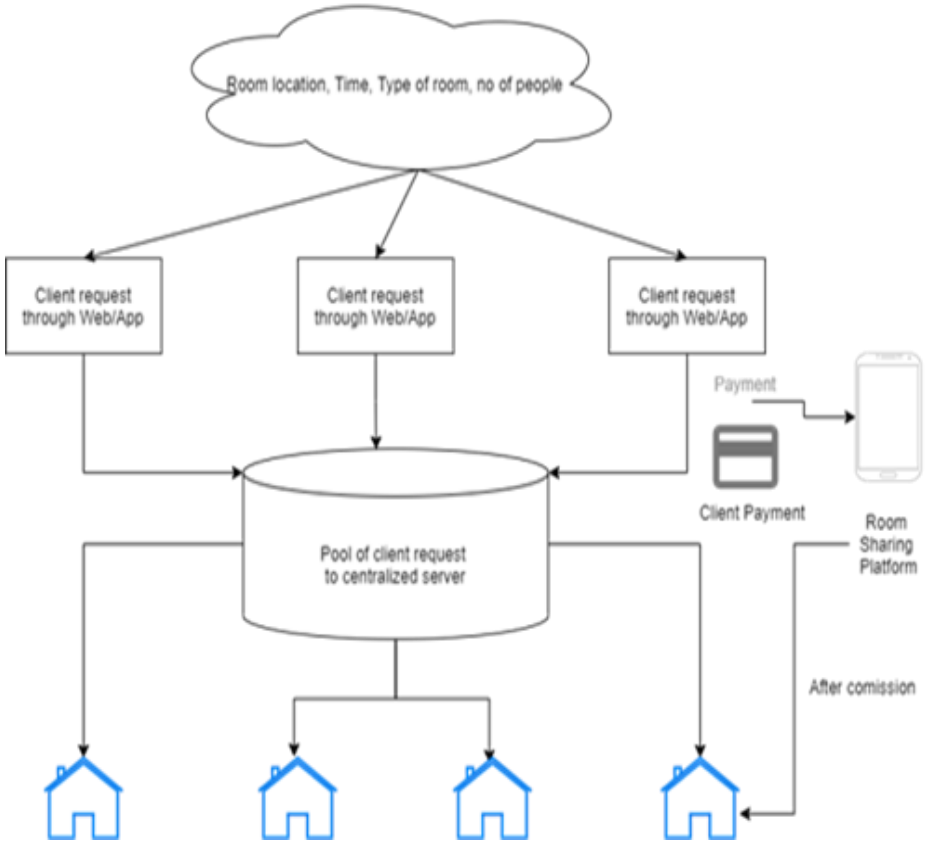

Figure 2. A Visual Overview of already Established Centralized Platforms for Room Sharing Services

i. The user searches for a room by using the website or mobile application.
ii. The user enters information such as the location of the room, the number of seats in the room, the length of stay, the number of people in the room, the kind of room, and the payment method.
iii. Information about the host and the user is shared.
iv. Once the user has finished their stay, they will make the payment through the application, and the accommodation provider will collect and forward the fee to the driver after deducting a considerable processing fee.
v. All exchanges of transactions or information occur through the intermediary service provider who acts as the central authority and holds authority over the data.

B. Decentralized Blockchain Solution

To fix the problem with the current centralized model highlighted in section 2.1, it is advised to use a decentralized approach. Blockchain is a peer-to-peer decentralized public ledger that allows transactions to take place without the need for intermediaries. All transactions that take place on a blockchain network are transparent, immutable, and secure. As a result, integrating blockchain into room-sharing services eliminates the middleman and reduces the cost of transactions between the host and the user, increasing the number of people who participate and benefiting them financially. As stated by S.E Chang et al. in their publication "Application of Blockchain Technology to Smart City Services," the implementation of blockchain technology in ride-sharing services will bring us closer to the idea of a smart city [13]. This is because it infuses technology into urban areas and integrates various social aspects for optimal resource utilization, high-value services, and increased public well-being. This can also be applied to the blockchain-based room-sharing system, which can assist smart cities in various social aspects such as optimal resource utilization, high-value services, and increased public well-being. The following are some of the benefits of Blockchain technology compared to centralized systems [11].

i. LESS COST: It indicates that blockchain eliminates the intermediary for information exchange, removing the need for an intermediary channel. Additionally, it empowers the user to rely on the data on the Blockchain rather than an unknown third party.
ii. TRANSPARENCY: Even though Blockchain is anonymous, it also gives transaction transparency. As a result, if something goes wrong, you can always go back to history. If something goes wrong with your transactions or data, you may look up the problem in your history.
iii. SAFETY: All data on the blockchain is cryptographically safeguarded, ensuring the data's authenticity. Since the data is distributed across the network and all parties can monitor each other in real-time, it becomes hard to carry out any illegitimate transactions.
iv. ACCESSIBILITY: The data on the blockchain is accessible across the network, allowing parties to see each other in real-time.
v. SAFE PAYMENTS: Smart contracts, another unique feature of blockchain, will allow users to make a secure payment straight to the Hosts and a user can pay using cryptocurrency.

C. Proposed Room Sharing Framework

A decentralized peer-to-peer framework that utilizes blockchain technology is proposed based on an existing framework. A decentralized application (DApp) is under development as a front-end interface, with the back-end built on the decentralized Ethereum blockchain. Within this framework, three user roles are established: the host, the user, and legal authorities for verification. In the DApp, each user's profile has this metadata information connected to it, which every node in the network can see. The process is outlined below figure3. [12]

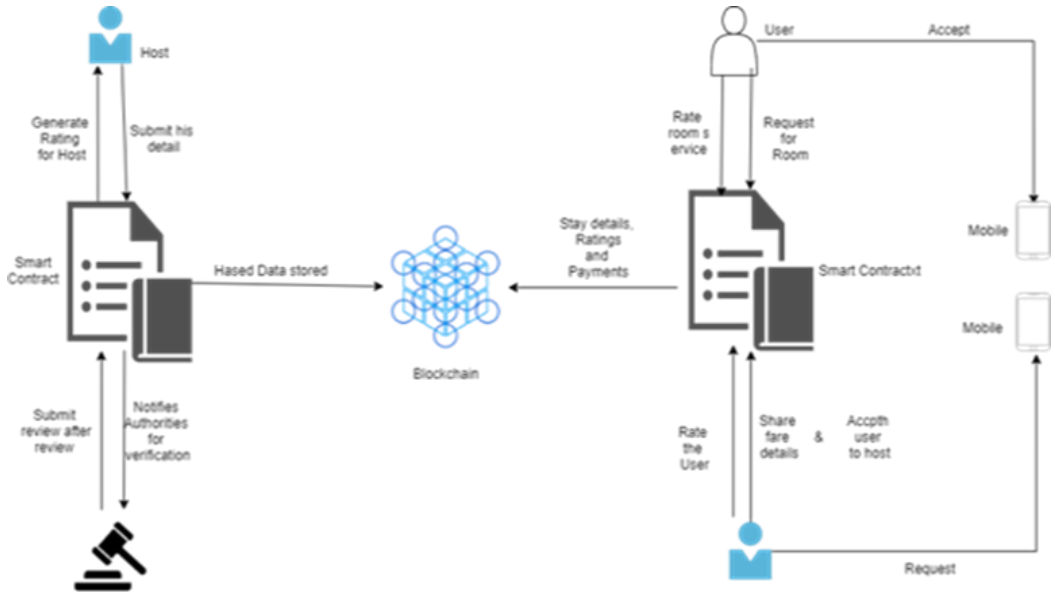

Figure 3. An Overview of The Decentralized Peer-To-Peer Room-Sharing Model

i. To create a profile in the network, the host provides their property papers and other required documents. The data is stored in MongoDB, and the encrypted value is stored in the blockchain using Metamask.
ii. Once the host provides the information, the legal authorities, who are also members of the network, will be contacted. Their remarks will be added to the host's profile when the background check is completed.
iii. Users who want to reserve a room need to register in the network by providing some basic information such as their name, phone number, and email address. Background verification will take place in the same way.
iv. After a user has been verified, they can book a room in a nearby area. Based on these requests, the host can compute the cost of transportation using several parameters, such as the number of days or nights the user plans to stay, as well as the type of accommodation the user selects.
v. Once the stay is finished, payment can be automated from one wallet to the other as cryptocurrency payments.

III. IMPLEMENTATION

A. Framework Setup

DApp development can be done with a variety of tools and libraries. However, in Table 3 the tools, and libraries used in the development of this ride-sharing DApp are briefly described.

Table 3. Technologies, Coding Languages, and Software Libraries Utilized in Crafting a Room-Sharing Decentralized Application (DApp)

Tools and Libraries	**Description**
Truffle Framework	Allow DApps to be created on the Ethereum network. Solidity provides a set of tools for writing Smart Contracts. Provide a framework for contract testing. Provides Smart Contracts in the Blockchain with tools to use. Inside truffle, it's used to create client-side apps.
Ganache	Runs a local instance of Ethereum.
Solidity	To develop and implement Smart Contracts in the Ethereum network, you'll need OOP knowledge.
Web3.js	JavaScript library that is open source. Provides an API for interacting with Ethereum nodes in the local area.
Node.js Server/ MetaMask	Server for DApp development at the back-end. Chrome browser extension that functions as a Web3 wallet.
Web front end	HTML/CSS/JavaScript, which extensively utilizes Web3Js to interact with the blockchain nodes.
MongoDB	Core information is stored on the blockchain, however, to aid in user details and displaying dashboard details, we use MongoDB

The local Ethereum framework is used to construct the proposed framework's prototype. MetaMask, Web3js, Nodejs, and MongoDB are some of the technologies that are used in this project. DApp distinguishes two types of stakeholders. The Host and the User, to be specific. Each user has a unique set of roles and responsibilities, each user has a distinct set of tasks and responsibilities, which are accessible via different DApp dashboards.1) The user's pick-up and drop information 2) The stay fee 3) Payment Status, whereas the Host dashboard displays 1) Stay details from start to finish and 2) Stay fare. When a user's information is input, it is saved in MongoDB and the credential's metadata is uploaded onto the blockchain. The DApp contains a front end which at the back end runs a decentralized platform. The workflow of the DApp is shown in Figure 4.

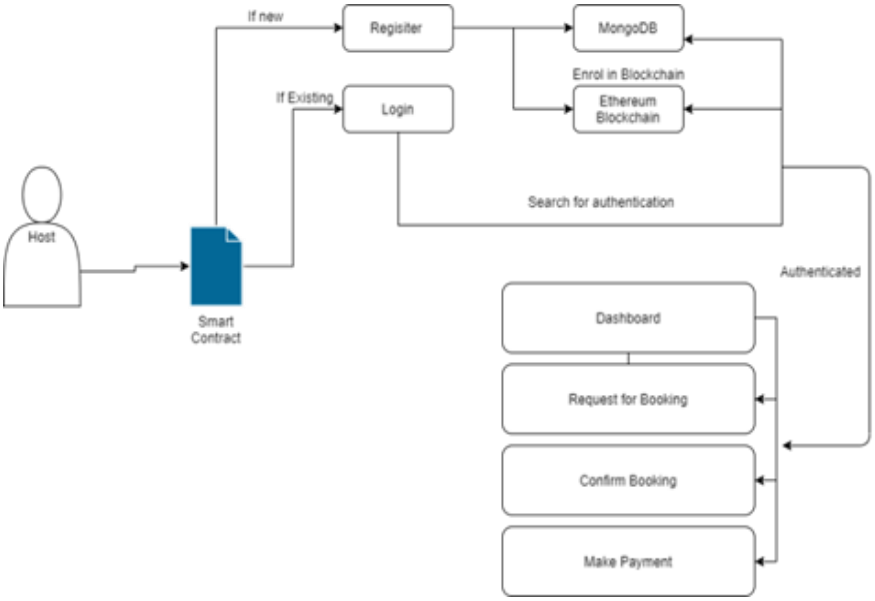

Figure 4. Workflow of the Decentralized Application for Room Sharing

One of the crucial issues in the peer-to-peer room-sharing system is the room matching issue. The ability of a room-sharing system to match hosts with users in the most efficient manner is a vital feature. A versatile room-sharing system must be equipped to provide an optimal solution to room-matching problems. Several algorithms that offer an optimal solution for a room-sharing system include greedy heuristic optimization, metaheuristic optimization, Exact formulation and heuristic solution, decomposition algorithm, and dynamic programming [14]. The DApp solves the matching problem by using a Min matching algorithm to connect the user with room to show the nearest best option. In order to reduce overall trip time and distance, the DApp uses an Euclidean distance and Manhattan distance code to match users who are requesting rooms.

B. Euclidean Distance

When using Euclidean distance in a room booking system, the distance between a room and a booking location would be calculated by measuring the straight-line distance between the coordinates (latitude and longitude) of the room and the booking location. This could be used as a criterion to match rooms with bookings based on the proximity of the room to the booking location, the pseudocode this shown in Table 4. For example, the following Pseudo code calculates the Euclidean distance between two points (latitude, longitude) in a 2D space [15].

Table 4. The Euclidean Distance Algorithm Is Used to Show A Small Distance Between The Room and The User After Booking

```
Function euclidean_distance(room, booking)
latitute1 and longitute1 = room
latitute2 and longitute2 = booking

RETURN sqrt((latitute1 - latitute2)^2 + (longitute1 - latitute2)^2)

ENDFUNCTION

Room_location = (51.509865, -0.118092)
Booking_location = (40.730610, -73.935242)
```

C. Minimum Matching Using Bipartite Graph and Manhattan Distance

Bipartite graphs are a type of graph that can be used to model relationships between two sets of objects. In the context of room recommendation, we can use a bipartite graph to model the relationship between rooms and booking requests. In Figure 5. On the left side of the graph, we would have the booking requests, and on the right side, we would have the rooms with scores. Each request would be connected to the rooms that meet its criteria along with the score. For example, User A makes a request for a room that is near their tolocation and has an attached washroom, parking, a bus stop, and a playground. The algorithm considers all of the rooms that meet those criteria and assigns them a score based on how well they match the user's preferences. The algorithm then finds the best possible assignment of rooms to requests.

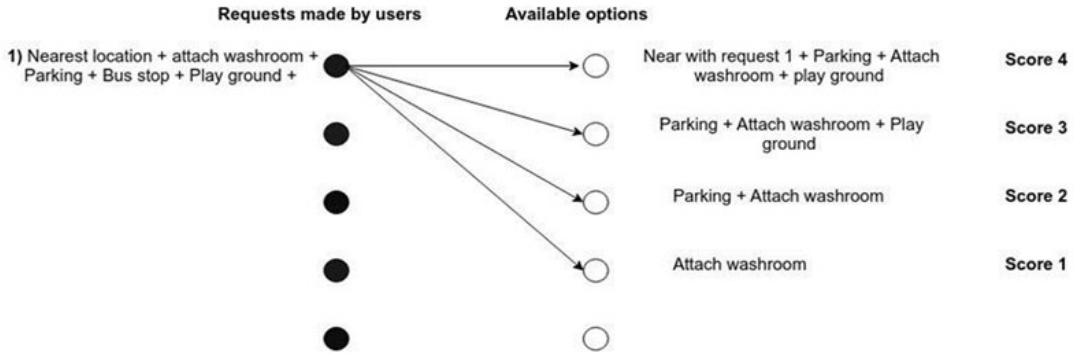

Figure 5. Bipartite Graph Representation of Accommodation Matching, Displaying Optimal Room Selection Based on User Preferences

The $calculate\_score()$ function in Table 4 uses the Manhattan distance to calculate proximity and adjusts the match quality accordingly, with shorter distances resulting in higher match quality. It also checks for facility matches and increases the match quality for each matching amenity.

This code will take the user's interest in amenities as input and run it through a recommendation algorithm. The algorithm will assign a score to each amenity based on the user's preferences and the availability of the amenity in the system. The algorithm will then recommend the amenities with the highest scores to the user as shown in the above Figure 5.

Table 5. Algorithm for Personalized Room Recommendations: Optimal Matching for User Preferences

```
Function calculate_score(room, request):
    score = 0

    # Check proximity (considering distance as score factor)
    room_location = (room.latitude, room.longitude)
    request_location = (request.latitude, request.longitude)
    distance = calculate_manhattan_distance(room_location, request_location)
    score -= distance  # Lower distance is preferred

    # Check other criteria
    If room.capacity >= request.attendees:
        score += 1

    If room.amenities contains all elements in request.amenities:
        score += len(request.amenities)

    If room.attached_washroom == request.attached_washroom:
        score += 1

    If room.parking_availability == request.parking_needed:
        score += 1

    If room.is_available(request.start_time, request.end_time):
        score += 1

    Return score
```

The code presented in Table 5 will take user data and process it, assigning scores to the user's choices. Based on these scores, recommendations will be generated and displayed to the user.

IV. RESULTS AND DISCUSSIONS

A. Experimental Results

Smart contracts are the lifeblood of blockchain applications, automating critical operations and enabling trustless interactions. But deploying these contracts incurs costs, both in terms of computational resources ("gas") and transaction fees. To assess these costs efficiently, we conducted experiments using three prominent smart contracts – Host Contract, User Contract, and Authentication – on a custom network simulated within Ganache. Table 5 details the deployment costs for each contract, providing valuable insights into their resource consumption and associated financial implications [24].

The contracts run through Ganache over a custom network and the cost are shown in Table 6.

Table 6. Smart Contract Deployment (Implementation) Cost

Contracts name	Execution cost	Transaction cost
Host Contract	1014987	1387779
User Contract	1680974	2269274
Authentication	671302	939570

B. Output

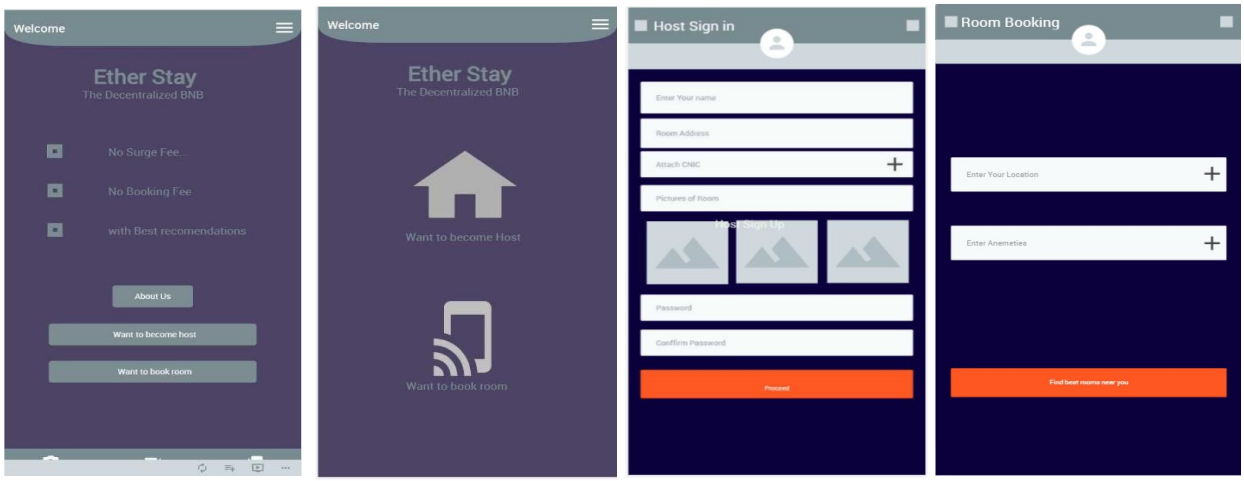

Figure 6. The Resultant Output of the Room-Sharing DApp System

C. Comparison with the Existing Decentralized Model of the Room-Sharing Platform

The proposed room-sharing system [12] is a decentralized, blockchain-based, peer-to-peer platform that is unique from other decentralized systems because it uses a bipartite min match algorithm for recommendation. This algorithm helps to ensure that guests are matched with hosts in a way that is both efficient and beneficial for both parties. The comparison table is shown below in Table 7.

Table 7. Comparison between Existing Ride-Sharing System and Proposed Room-Sharing System

Features	**Existed Ride-Sharing System**	**Proposed Room-Sharing System**
Decentralized	Yes	Yes
Cryptocurrency payment	Yes	Yes
Mobile and Web Application	No (Only Mobile Application)	Yes
Shortest distance route after booking	Yes (Manhattan distance)	Yes (Euclidean Distance and Manhattan distance)
Recommendation system	No	Yes (Min Matching Bipartite Algorithm)

D. Future Work

From above discussion this paper mainly focuses on room sharing system and it is the most secure system which will bring the revolutionary change in tourism industry. because our system store user data in blockchain database using cryptography [26]. To make it more secure our ambition is to introduce QR codes for guests which will make the whole process more smooth and secure.

Additionally, we propose the implementation of VR (Virtual Reality) for users to check the room condition before booking [27]. Moreover, we will introduce AI personalized room optimization process [25]. AI algorithms can store the guest preferences, user experiences and user feedbacks, according to these preferences the system will offer personalized recommendations. Ultimately, we will focus to introduce QR Code payment once the user scan the QR code the 50% percent payment will be transferred to the host or room owner, Once the stay is finished the remaining payment will be transferred automatically.

V. CONCLUSION

This paper's main objective is to examine the cutting-edge shared economy technology Blockchain and how it fits into the concept of a smart city. The existing framework for decentralized, peer-to-peer, blockchain-based room-sharing services is presented in this article, along with a suggestion for an improved version of the same. A decentralized application (DApp) is also created to support this room-sharing framework. It will serve as a user interface on the front end, supported by blockchain. In this DApp, smart contracts are used to automate network transactions and information exchange on Ethereum, a permissionless public blockchain.

In summary, smart contracts which are encoded in digital code can be kept in decentralized and transparent databases through the use of blockchain technology These databases' data are thought to be changeable. It is planned that every procedure and job would have a digital record that can be recognized and verified using a digital signature. There won't be a need for middlemen in our ecosystem. In fact, blockchain transforms governance and business models, but this won't happen for many years. Blockchain is not a technology that aims to disrupt current business models by replacing them with cheaper alternatives, but it can be considered as a technology that can build new foundations for solving economic and social problems.

Blockchain is not a quick fix for an everyday technological issue. Although it can ease the transition, a precise plan built on opportunities that have been proven to work must be established. It will take decades for blockchain to permeate our socioeconomic infrastructure, despite the fact that it will have a significant impact. Acceptance will be gradual and steady rather than abrupt as waves of technical and structural change advance.

ACKNOWLEDGEMENT

The authors received no funding from any party for the research and publication of this article.

AUTHOR CONTRIBUTIONS

Hasnain Raza: Writing – Original Draft Preparation, Investigation, Conceptualization, Data Curation, Validation;

Reqad Ali: Formal analysis, Methodology, Writing – Review & Editing;
Jawaid Iqbal: Project Administration, Resources, Supervision, Writing – Review & Editing;
Muhammad Awais: literature review, Formatting,

CONFLICT OF INTERESTS

No conflict of interests were disclosed.

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