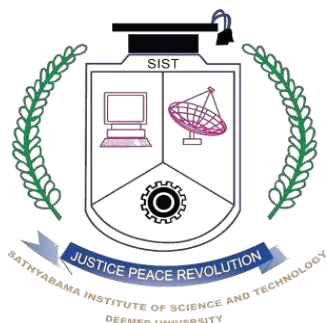


BLOCK CHAIN BASED SHARING ECONOMIC SERVICES IN A SMART CITY

Submitted in partial fulfillment of the requirements for
the award of

Bachelor of Engineering degree in Computer Science and Engineering
by

KAUVERI KAVYASHREE GOBI, (38110246,)



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHOOL OF COMPUTING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade “A” by NAAC

**JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI
- 600 119**

APRIL – 2020



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www.sathyabama.ac.in



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **KAUVERI KAVYASHREE GOBI, (38110246,)** who carried out the project entitled **“BLOCK CHAIN BASED SHARINH ECONOMIC SERVICES IN A SMART CITY”** under our supervision from November 2019 to March 2020.

Internal Guide

Dr.R.Sathyabama Krishna M.E.,Ph.D.,

Head of the Department

Dr. S. Vigneshwari M.E., Ph.D.

Submitted for Viva voce Examination held on

Internal Examiner

External Examiner

DECLARATION

I **BATTULA CHANDINI (36110155)** hereby declare that the Project Report entitled **“BLOCK CHAIN BASED SHARING ECONOMIC SERVICES IN SMATRT CITY”** done by me under the guidance of **Dr.R.Sathyabama Krishna M.E.,Ph.D.**, is submitted in partial fulfilment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

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ABSTRACT

The drastically arranged intelligent city prepare calls for an assortment of security contemplations for a heterogeneous gizmo condition. As of past due, innovation new agencies have utilized the functionality of block chain-based totally improvements to manage agencies or relational trust by means of upholding marked agreement amongst numerous people in a decentralized state of affairs. In any casing, it will be hard sufficient persuading that the block-chain innovation should absolutely sup-planters among changing associate the communion saving as sharing disposal consistently paintings in a profoundly powerful circumstance. With the fasting growing of the lease securities industry, the sharing saving faces an ever-growing number of serious problems as administrative vulnerability and concerns about unwell-usage. block-chain records trustworthiness. Besides, block-chain's unchanging nature develops a effective area for making superb, perpetual and developing data units for profound getting to know. The mixture of ai and block-chain could have an effect on fields like net of things (iot), man or woman, money related markets, not unusual management, terrific towns regions, little networks, supply chains, customized remedy and distinctive fields, and along these strains convey blessings to numerous individuals. On this suggest paintings a flask framework to offer co-lateral agreement of administrations for the reasonable net of factors (iot) empowered sharing financial system in superb shrewd towns groups utilising convolutional neural system.

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LIST OF ABBREVIATIONS

IoT	Internet of Things
AI	Artificial Intelligence
EMR	Electronic Medical Record
FCT	Fog Computing Terminals
MD	Mobile Devices
DSDM	Dynamic Systems Development Model
XP	Extreme Programming
FDD	Feature Driven Development
JAD	Joint Application Development
LD	Lean Development
RAD	Rapid Application Development
RUP	Rational Unified Process
SDLC	Systems Development Life Cycle
RAD	Rapid Application Development
MVC	Model View Controller
PoW	Power of Work
PoS	Power of Stake
PoB	Power of Burn
SHA	Secure Hash Algorithm

CHAPTER 1

INTRODUCTION

1.1 MOTIVATION

Cognitive computing is based on the human thought processes, and it imparts this intelligence to different computerized systems. Cognitive computing is composed of automatic machine learning techniques that use data analytics, pattern recognition, and natural language processing to think like humans. When trained, these systems do not require human assistance. The cognitive engine is similar to powerful brains that drive the distributed IoT devices. This new brain can scan through vast data resources and build intelligence that is required for decision-making and future initiatives. These cognitive engines possess powerful analytics capability and data processing power that imparts human like intelligence into Blockchain frameworks

1.2 OBJECTIVES

We propose a Block chain-based infrastructure to support security- and privacy-oriented spatio-temporal smart contract services for the sustainable Internet of Things (IoT) enabled sharing economy in mega smart cities. The infrastructure leverages cognitive fog nodes at the edge to host and process offloaded geo-tagged multimedia payload and transactions from a mobile edge and IoT nodes, uses AI for processing and extracting significant event information, produces semantic digital analytics, and saves results in Block chain and decentralized cloud repositories to facilitate sharing economy services. The framework offers a sustainable incentive mechanism, which can potentially support secure smart city services, such as sharing economy, smart contracts, and cyber-physical interaction with Block chain and IoT. Our unique contribution is justified by detailed system design and implementation of the framework.

1.3 OVERVIEW OF THE PROJECT

The overall project report is organized as follows.

Chapter 2: Literature Survey

This chapter is used about the literature survey, where the work related with Block chain.

Chapter 3: System Design

This chapter provides overall system for the processed system.

Chapter 4: Detailed System Design

This chapter gives the detailed design for each process in the system.

Chapter 5: Experimental Results

This chapter discusses about the experimental results and analyse the performance of each classifier.

Chapter 6: Conclusion

Finally, this chapter concludes with overall summary of the Block chain generation with future enhancement.

CHAPTER 2

LITERATURE SURVEY

Nicolas Herbaut et al proposes, the constant rise of over-the-top video consumption nowadays challenges the current Internet architecture. In this article, we propose a user-centric approach that helps the necessary reshaping of the content delivery ecosystem. We study how block chain-powered smart contracts and network service chaining can be exploited to support such novel collaboration schemes. Finally, our findings suggest that the proposed solution can complement existing technologies by supporting a wide range of business cases while at the same time significantly reducing costs. The sharing economy has encountered rushes of hyper excitement, yet it still can't seem to arrive at its maximum capacity. The vast majority of the plan of action of stages, for example, Airbnb and Uber assume a job as middle people among clients and private assets. The block chain is expressed to furnish a foundation with the possibility to sort out genuinely decentralized markets.

Literature Survey 1	
Title	A Model for Collaborative Blockchain-Based Video Delivery Relying on Advanced Network Services Chains.
Authors	Nicolas Herbaut and Daniel Negru.
Published Year	June 2017
Efficiency	CDNs is that they are spread more widely in the network, with a smaller average distance to end users.
Drawbacks	Implementing a trusted, scalable platform able to handle negotiation messages from different stakeholders and process them according to specific business rules can be highly challenging.
Description	This method proposes, The constant rise of over-the-top video consumption nowadays challenges the current Internet architecture. In this article, we propose a user-centric approach that helps the necessary reshaping of the content delivery ecosystem. We study how blockchain powered smart contracts and network service chaining can be exploited to support such

	novel collaboration schemes. Finally, our findings suggest that the proposed solution can complement existing technologies by supporting a wide range of business cases while at the same time significantly reducing costs.
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Table 2.1 Literature Survey 1

Hadeal Abdulaziz Al Hamid et al proposes, telemedicine is an emerging healthcare service where the healthcare professionals can diagnose, evaluate, and treat a patient using telecommunication technology. To diagnose and evaluate a patient, the healthcare professionals need to access the electronic medical record (EMR) of the patient, which might contain huge multimedia big data including x-rays, ultrasounds, CT scans, MRI reports, etc. For efficient access and supporting mobility for both the healthcare professionals as well as the patients, the EMR needs to be kept in big data storage in the healthcare cloud. In spite of the popularity of the healthcare cloud, it faces different security issues; for instance, data theft attacks are considered to be one of the most serious security breaches of healthcare data in the cloud. In this paper, the main focus has been given to secure healthcare private data in the cloud using a fog computing facility. To this end, a tri-party one round authenticated key agreement protocol has been proposed based on the bilinear pairing cryptography that can generate a session key among the participants and communicate among them securely. Finally, the private healthcare data are accessed and stored securely by implementing a decoy technique.

Literature Survey 2	
Title	A Security Model for Preserving the Privacy of Medical Big Data in a Healthcare Cloud Using a Fog Computing Facility with Pairing-Based Cryptography.
Authors	Hadeal Abdulaziz Al Hamid, Sk Md Mizanur Rahman, M. Shamim Hossain, Ahmad Almogren, Atif Alamri.
Published Year	2017
Efficiency	We can achieve higher security with a smaller key size, so we can use a much smaller prime to achieve the same complexity as working with integers.

Drawbacks	Privacy issues are all about three things, which are trust, uncertainty, and compliance. Also, another issue related to the consumer is lack of transparency, which may appear through the consumer not knowing where his/her data are physically stored or what happens to it.
Description	This paper proposes, Nowadays, telemedicine is an emerging healthcare service where the healthcare professionals can diagnose, evaluate, and treat a patient using telecommunication technology. To diagnose and evaluate a patient, the healthcare professionals need to access the electronic medical record (EMR) of the patient, which might contain huge multimedia big data including x-rays, ultrasounds, CT scans, MRI reports, etc. For efficient access and supporting mobility for both the healthcare professionals as well as the patients, the EMR needs to be kept in big data storage in the healthcare cloud. In spite of the popularity of the health care cloud, it faces different security issues; for instance, data theft attacks are considered to be one of the most serious security breaches of healthcare data in the cloud. In this paper, the main focus has been given to secure healthcare private data in the cloud using a fog computing facility. To this end, a tri-party one round authenticated key agreement protocol has been proposed based on the bilinear pairing cryptography that can generate a session key among the participants and communicate among them securely. Finally, the private healthcare data are accessed and stored securely by implementing a decoy technique.

Table 2.2 Literature Survey 2

Tian Zhang enables proprietors to enroll and lease gadgets without a confided in outsider association. Be that as it may, a blockchain based framework spills security data of the included gatherings because of its receptiveness to general society, and a protection regarding approach is proposed to authorize understandings among proprietors and real clients of products.

Literature Survey 3	
Title	Data Offloading in Mobile Edge Computing: A Coalition and Pricing based Approach.
Authors	Tian Zhang
Published Year	July 2017
Efficiency	A new optimization framework that minimizes app energy consumption and service response time is proposed by jointly optimizing the QoR and the offloading strategy.
Drawbacks	Traditional data collection of edge MDs are transferred to the core network directly with high bandwidth cost.
Description	This paper, Mobile edge computing (MEC) that affords service to the vicinity of mobile devices (MDs) has become a key technology for future network. Offloading big data to the MEC server for preprocessing is an attractive approach of MDs. In this paper, we investigate data offloading from MDs to MEC servers, and a coalitional game based pricing scheme is proposed. We apply coalitions to arrange data offloading of MDs as well as depict the offloading relationship between MDs and MEC servers. Furthermore, pricing is utilized as the stimuli for the offloading. In the proposed scheme, a scheduled MD in a coalition chooses an MEC server within the same coalition for offloading, and pays the selected MEC server for the MEC service. By analyzing the formulated coalitional non-transferable utility (NTU) game, theoretical properties are derived and sufficient conditions for the core existence are given. Finally, the utility performances of the proposed scheme are demonstrated by numerical results

Table 2.3 Literature Survey 3

Elham Hassanain proposes the framework uses a hybrid of cloud at the server end and fog computing terminals (FCT) at the crowd edge. The concept of FCT is realized by adding a middle layer acting as a proxy between the user end and cloud infrastructure. Each FCT node covers a geographic zone and

provides a subset of services and resources based on the geographic location of a mobile user. When a user moves from one FCT-covered zone to another, the secure handshaking of metadata about the user is shared with the new FCT node. The communication between mobile users' terminals such as smartphone and the FCT is assumed as 4G/5G networks, while the communication between the FCT and cloud is based on a high speed, always available, and reliable Internet connection. The location of each mobile user is made secure and shared according to our novel privacy policy paradigm. The framework is designed to switch between FCT and cloud, depending on the task, network condition, geographic nearness, and resources available within the client unit. We have implemented the framework to support context-aware services to millions of pilgrims that gather together in a very small area of land each year. We will share the inspiring results that we have gathered after initial deployment.

Literature Survey 4	
Title	A Security Model for Preserving the Privacy of Medical Big Data in a Healthcare Cloud Using a Fog Computing Facility with Pairing-Based Cryptography.
Authors	Elham Hassanain
Published Year	March 2017
Efficiency	The healthcare cloud infrastructure would make it much easier to pull all different healthcare information together for a patient while the patient moves from one hospital to another; as a result, the patients' information can be managed and tracked easily.
Drawbacks	The challenges related to cloud computing's legal and policy issues are: liability, applicable law, compliance, copyright, data portability, and data protection.
Description	This method proposes, Nowadays, telemedicine is an emerging healthcare service where the healthcare professionals can diagnose, evaluate, and treat a patient using telecommunication technology. To diagnose and evaluate a patient, the healthcare professionals need to access the electronic medical record (EMR) of the patient, which might contain huge multimedia big data including x-rays, ultrasounds, CT scans, MRI reports, etc. For efficient access and supporting mobility for both the healthcare professionals as well as the

	patients, the EMR needs to be kept in big data storage in the healthcare cloud. In spite of the popularity of the healthcare cloud, it faces different security issues; for instance, data theft attacks are considered to be one of the most serious security breaches of healthcare data in the cloud. In this paper, the main focus has been given to secure healthcare private data in the cloud using a fog computing facility. To this end, a tri-party one round authenticated key agreement protocol has been proposed based on the bilinear pairing cryptography that can generate a session key among the participants and communicate among them securely. Finally, the private healthcare data are accessed and stored securely by implementing a decoy technique.
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Table 2.4 Literature Survey 4

Md. Abdur Rahman et al proposed a blockchain-based foundation for the IoT-empowered sharing economy in uber smart cities communities. The proposed foundation use the intellectual figuring and off-chain based decentralized information stockpiling for a monstrous group. Dorri present a conveyed answer for ensure the protection of clients and to the security of the vehicle biological system. The proposed security design is famously appropriate for vehicle sharing administrations, which require a believed correspondence channel to trade information including the area of the vehicle, keys to open the vehicle, and installment subtleties of the client. Albeit impressive work has been directed, this examination is first to help sharing economy administrations with the guide of subjective figuring and secure block chain-and off chain-based decentralized information stockpiling for a gigantic group. In the following segment, we give the key phrasings and fundamental information territories identified with the examination.

Literature Survey 5	
Title	Towards A Secure Mobile Edge Computing Framework for security.
Authors	Md. Abdur Rahman, M. Shamim Hossain.

Published Year	July 2016
Efficiency	High bandwidth Low latency Low battery consumption One-time installation cost Local and low computation need that can be used to provide navigation to users in the same physical proximity
Drawbacks	Traffic-oriented security breaches might be possible: a) passive eavesdropping attack b) impersonating attack c) man in the middle attack d) trust forging attack e) independent negative attack f) collusive attack.
Description	This paper proposes, the cloud computing paradigm faces the challenges of providing low latency, high availability, and real-time location-aware services where millions of people are mobile. In this paper, we propose a mobile edge computing framework that can support real-time, location-aware personalized services to a very large crowd. The framework uses a hybrid of cloud at the server end and fog computing terminals (FCT) at the crowd edge. The concept of FCT is realized by adding a middle layer acting as a proxy between the user end and cloud infrastructure. Each FCT node covers a geographic zone and provides a subset of services and resources based on the geographic location of a mobile user. When a user moves from one FCT-covered zone to another, the secure handshaking of metadata about the user is shared with the new FCT node. The communication between mobile users' terminals such as smartphone and the FCT is assumed as 4G/5G networks, while the communication between the FCT and cloud is based on a high speed, always available, and reliable Internet connection. The location of each mobile user is made secure and shared according to our novel privacy policy paradigm. The framework is designed to switch between FCT and cloud, depending on the task, network condition, geographic nearness, and resources available within the client unit. We have implemented the framework to support context-aware services to millions of pilgrims that gather together in a very small area of land each year. We will share the inspiring results that we have gathered after initial deployment.

Table 2.5 Literature Survey 5

CHAPTER 3

METHODOLOGY

3.1 EXISTING SYSTEM

Fog computing system is an emergent architecture for providing computing, storage, control, and networking capabilities for realizing Internet-of-Things (IoT). In the fog computing system, the mobile devices (MDs) can offload its data or computational expensive tasks to the fog node within its proximity, instead of distant cloud. Although offloading can reduce energy consumption at the MDs, it may also incur a larger execution delay including transmission time between the MDs and the fog/cloud servers, and waiting and execution time at the servers. Therefore, how to balance the energy consumption and delay performance is of research importance.

Extensive simulation studies are conducted to demonstrate the effectiveness of the proposed scheme and the superior performance over several existed schemes are observed.

3.2 PROPOSED SYSTEM

Cognitive computing is based on the human thought processes, and it imparts this intelligence to different computerized systems. Cognitive computing is composed of automatic machine learning techniques that use data analytics, pattern recognition, and natural language processing to think like humans. When trained, these systems do not require human assistance. The cognitive engine is similar to powerful brains that drive the distributed IoT devices. This new brain can scan through vast data resources and build intelligence that is required for decision-making and future initiatives. These cognitive engines possess powerful analytics capability and data processing power that imparts human like intelligence into Blockchain frameworks.

3.3 TECHNOLOGICAL BACKGROUND

To implement the project, some open source tools have been used such as Python as web server. The programming languages used to implement this project are Python, Liciplse is used as database server.

3.3.1 PYTHON

Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object oriented, imperative, functional and procedural, and has a large and comprehensive standard library. Python interpreters are available for many operating systems. Python, the reference implementation of Python, is open sourcesoftware and has a community-based development model, as do nearly all of Python's other implementations. Python and Python are managed by the non-profit Python Software Foundation Python is a multi-paradigm programming language. Object-oriented programming and structured programming are fully supported, and many of its features support functional programming and aspect-oriented programming .Many other paradigms are supported via extensions, including design by contract and logic programming.

Python uses dynamic typing, and a combination of reference counting and a cycle-detecting garbage collector for memory management. It also features dynamic name resolution, which binds method and variable names during program execution. Python's design offers some support for functional programming in the Lisp tradition. It has filter(), map(), and reduce() functions; list comprehensions, dictionaries, and sets; and generator expressions. The standard library has two modules that implement functional tools borrowed from Haskell and Standard ML.

3.4 SYSTEM ANALYSIS

One of the primary choices we face for our project implementations is “Which development methodology should we use?” There are various software development methodologies are available in the ICT industry. They are

- Agile Software Development
- Crystal Methods
- Dynamic Systems Development Model (DSDM)

- Extreme Programming (XP)
- Feature Driven Development (FDD)
- Joint Application Development (JAD)
- Lean Development (LD)
- Rapid Application Development (RAD)
- Rational Unified Process (RUP)
- Scrum
- Spiral
- Systems Development Life Cycle (SDLC)
- Waterfall Model

Among all these methodologies, we have decided to compare the two most popular and widely used methodologies:

- Waterfall Model
- RAD Model

3.5 Software Environment

The software requirements document is the software specification of the system. It should include both a definition and a specification of a requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the team's progress throughout the development activity.

- OPERATING SYSTEM : WINDOWS 10
- PROGRAMMING LANGUAGE : PYTHON
- TOOLS : LICIIPSE
- DATABASE : SQL

3.6 OVERALL SYSTEM ARCHITECTURE

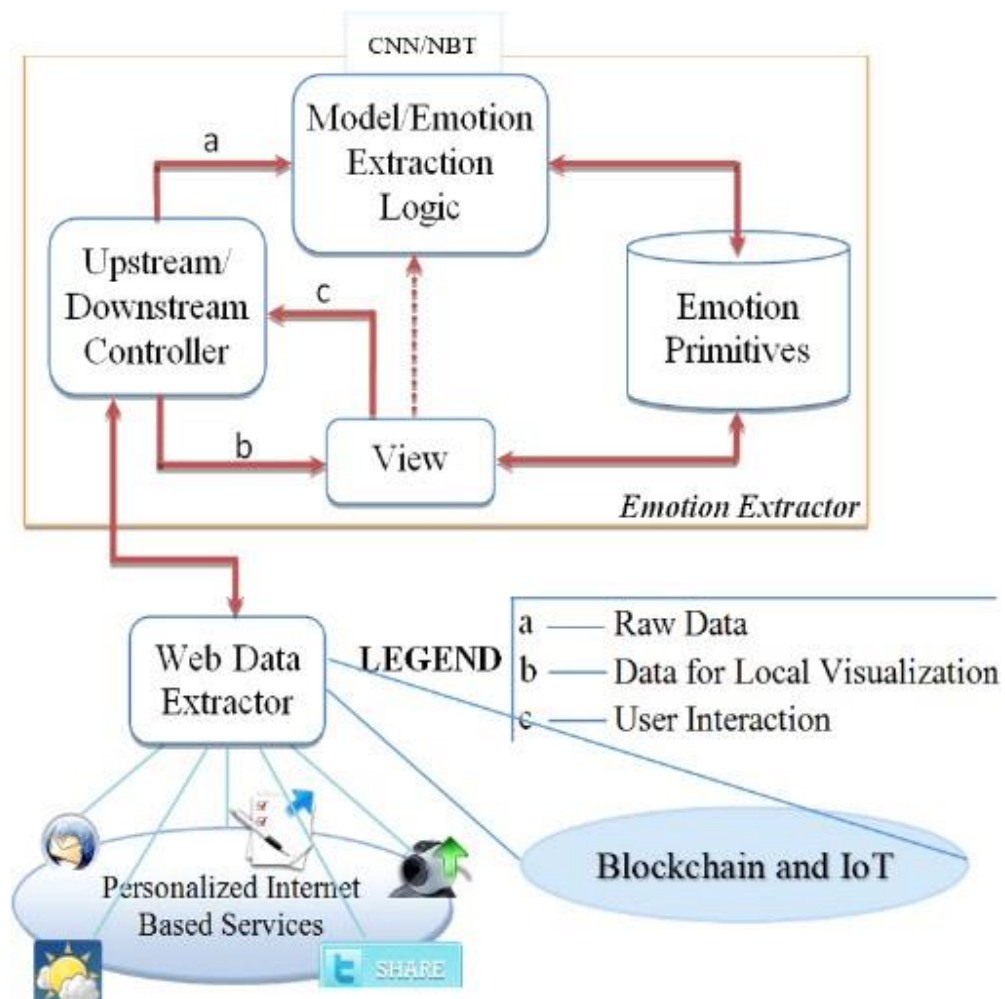


Fig.3.1 SYSTEM ARCHITECTURE

Mechanized Blockchain-based sharing economy benefits, the money related exchanges and administrations are computerized and wisely oversaw by the subjective motor. The partners take an interest in confided in tasks where the understanding is examined by the psychological framework, and the commitments are executed naturally without human contribution. Such smart understanding or agreement is made out of secure codes, which manages other comparable brilliant agreements. Such a framework can settle on astute choice, perform information investigation, and utilize Radio-Frequency Identification (RFID), Near-field correspondence (NFC), or area data for IoT gadgets to transmit their information to circulated shared Blockchain records. Simulated intelligence operators are accessible to oversee such self-ruling frameworks with circulated IoT gadgets. Consequently, Blockchain-based sharing economy administrations and AI operators take business sharing by utilizing smart contracts.

The blockchain suits the sharing economy and can help build smart cities because of the trust vested in it. It was designed to eliminate intermediaries in digital transactions by making it safe for strangers to exchange assets and data with each other privately on public record. Blockchain transactions involve two keys – a private and a public one. The public one is useful in verifying transactions. While, the private key is useful in ensuring privacy.

DESCRIPTION

Model

The central component of the pattern. It is the application's dynamic data structure, independent of the user interface. It directly manages the data, logic and rules of the application.

View

Any representation of information such as a chart, diagram or table. Multiple views of the same information are possible, such as a bar chart for management and a tabular view for accountants.

Controller

Accepts input and converts it to commands for the model or view. In addition to dividing the application into these components, the model–view–controller design defines the interactions between them. The model is responsible for managing the data of the application. It receives user input from the controller. The view means presentation of the model in a particular format. The controller responds to the user input and performs interactions on the data model objects. The controller receives the input, optionally validates it and then passes the input to the model. As with other software patterns, MVC expresses the "core of the solution" to a problem while allowing it to be adapted for each system. Particular MVC designs can vary significantly from the traditional description here.

Blockchain is a democratic technology – one of the people – because it decentralizes power. It allows humans to organize any activity without any one person or entity gaining full control over it. It achieves this using a proof-of-work mechanism that allows the blockchain to run automatically on distributed consensus. This feature is also critical for effective management of the large volumes of data that populations of sharing, smart cities produce. With distributed computing and distributed consensus, blockchain can foster a community of peers, who will work together to achieve the goal of development.

Development is most dependent on the economy. Without a thriving economy, no region can develop successfully. Economy, on the other hand, is dependent on the supply and demand of goods and services. If these two actively balance each other out, then the economy will be stable and growth sustainable. When there is a scarcity of supply, however, it is difficult. The imbalance may still support growth. Nonetheless, this growth will not be long-term.

The sharing economy is a model for development when there is a scarcity in supply of goods and services. It aims to make the best of under-utilized urban resources like space, transportation, necessities (food, water, clothes, shelter), environment, and other materials to smartly bridge the gap between the supply and demand of goods and services. It is a way to maintain balance in the cost of goods and services, despite an imbalance in market forces.

The sharing economy is of the people. It is run by the people for the people. In it, individuals offer the goods and services that they own or possess on a short-term basis with the goal to meet present demands immediately. Hence, this form of economy lays less emphasis on ownership of resources so that the access to these resources takes precedence.

UPSTREAM AND DOWNSTREAM EXTRACTOR

Upstream is the supply network of company suppliers and their own suppliers. Anything coming into your company from raw materials to finished products and used in whatever you deliver to your customers is in the upstream part of your supply chain. The “downstream” approach referred to interventions addressing the problems after they are already there and trying to mitigate them, without looking so much at what is causing them. “Upstream” referred to addressing the social, economic, political, environmental problems that cause the problems, and intervene early.

WEB DATA EXTRACTOR

Web Data Extraction is an important problem that has been studied by means of different scientific tools and in a broad range of applications. Many approaches to extracting data from the Web have been designed to solve specific problems and operate in ad-hoc domains. Other approaches, instead, heavily reuse techniques and algorithms developed in the field of Information Extraction.

EMOTION PRIMITIVES

In order to integrate emotion recognition in any interactive system, we define a generic software architecture model. Few generic models exist for emotion recognition. We define a flexible and multimodal architecture model, the “emotion branch”. We limit ourselves in the definition of this model to emotion interpretation of physical cues from the user, such as face expressions, vocal characteristics, ANS, gesture and posture. We don't aim at covering each of these modalities but rather provide a model for implementing a multimodal emotion recognition system.

3.7 FLASK FRAMEWORK

Python coding style comprises physical lines as well as logical lines or statements. A physical line in a Python program is a sequence of characters, and the end of the line terminates the line sequence as opposed to some other languages, such as C and C++ where a semi-colon is used to mark the end of the statement. A logical line, on the other hand, is composed of one or more physical lines. The use of a semi-

colon is not prohibited in Python, although it's not mandatory. The NEWLINE token denotes the end of the logical line. A logical line that only contains spaces, comments, or tabs are called blank lines and they are ignored by the interpreter.

As we saw that in Python, a new line simply means that a new statement has started. Although, Python does provide a way to split a statement into a multiline statement or to join multiple statements into one logical line. This can be helpful to increase the readability of the statement. Following are the two ways to split a line into two or more lines:

3.8 Explicit Line Joining

In explicit line joining, we use a backward slash to split a statement into a multiline statement.

Implicit Line Joining

Statements that reside inside [], {}, or () parentheses can be broken down into two or more physical lines without using a back slash.

Multiple Statements on a Single Line

In Python, it is possible to club multiple statements in the same line using a semi-colon; however, most programmers do not consider this to be a good practice as it reduces the readability of the code.

Whitespaces and Indentation

Unlike most of the programming languages, Python uses indentation to mark a block of code. According to Python coding style guideline or PEP8, we should keep an indent size of four.

Most of the programming languages provide indentation for better code formatting and don't enforce to have it. But in Python it is mandatory. This is why indentation is so crucial in Python.

Comments in any programming language are used to increase the readability of the code. Similarly, in Python, when the program starts getting complicated, one of the best ways to maintain the readability of the code is to use Python comments. It is considered a good practice to include documentations and notes in the python syntax since it makes the code way more readable and understandable to other programmers as well, which comes in handy when multiple programmers are simultaneously working on the same project.

The code can only explain how it does something and not why it does that, but Python comments can do that. With Python comments, we can make documentations for various explanations in our code itself.

Comments are nothing but tagged lines of codes which increase the readability of a code and make it self-explanatory. There are different ways of creating comments depending on the type of comment we want to include in our code. Following are different kinds of comments that can be included in our Python program:

- Single Line Comments
- Doc string Comments
- Multiline Comments

Single line Python comments are marked with `#` character. These comments end at the end of the physical line, which means that all characters starting after the `#` character (and lasts till the end of the line) are part of the comment.

Python has the documentation strings (doc strings) feature which is usually the first statement included in functions and modules. Rather than being ignored by the Python Interpreter like regular comments, doc strings can actually be accessed at the run time using the dot operator.

It gives programmers an easy way of adding quick notes with every Python module, function, class, and method. To use this feature, we use triple quotes in the beginning of the documentation string or comment and the closing triple quotes at the end of the documentation comment. Doc strings can be one-liners as well as multi-liners.

Unlike some programming languages that support multiline comments, such as C, Java, and more, there is no specific feature for multiline comments in Python. But that does not mean that it is totally impossible to make multiline comments in Python. There are two ways we can include comments that can span across multiple lines in our Python code.

3.9 Liclipse

LiClipse is at the core for all Python based application development activities. It's been available for many years. LiClipse is a set of plugins to enhance Eclipse. It improves the overall Eclipse experience. It is best IDE tool to develop Python Applications.

Advantages of LiClipse

- Perfect Debugger

- Error checking features
- An enhanced ability to analyze the code for quality and security concerns
- Auto complete feature

Based on the various IDE that are described above, we decided to use LiClipse as IDE (Integrated Development Environment) for developing the web based application.

Important Features That Make LiClipse our IDE of Choice

- Rich Reusable Libraries are available
- Model Driven Development
- Enterprise Python Tooling
- Powerful Debugging options

3.10 Selection of Operating System

There are various open source and commercial Operating systems are available in the market. Computer Operating systems can be broadly classified into two types:

- Normal Operating System
- Real Time Operating System

We have decided to use Windows 10 for application.

Windows 10 is a is the most powerful Microsoft operating system it can be used for desktop/laptop computers as well as IoT devices.

Important Features That Make Windows 10 our Operating System of Choice

- The loading time is very fast compare to other OS
- Supports built-in mobile device executive facilities
- Stability and performance
- Have hologram technology

3.11 Selection of Web Application Framework

Framework provides a structure for application development. This makes web application programmers' lives easier when developing consistent, accessible, and workable enterprise wide web applications. They automate the implementation of redundant tasks or extensions for common operations, reduces the development and testing time and allowing programmers to concentration more on application logic instead of routine works.

Python framework can be classified as two types:

- Full-Stack Framework

The full-stack systems give total help to engineers, including vital components, for example, structure approval, structure generators, and format designs.

- Web2py
- Django
- Flask
- Turbo Gears
- Zope2
- Cubic Web
- Grok
- Pylon

- Non-Full Stack

The non-full-stack systems don't give extra functionalities and highlights to the clients. Designers need to include a great deal of code and different things physically.

- Micro-framework

Miniaturized scale structures are little, straightforward, and simple to utilize. They are laconic and have straightforward documentation. URL directing is frequently REST-ful web services.

Miniaturized scale systems use WSGI and work through HTTP request/Response. They are a decent decision for little applications, or as a feature of a bigger undertaking.

- Cherry-Py
- Flask
- Bottle
- Pyramid
- Bobo
- Asynchronous Framework

In situations where solicitation handling pace assumes a significant job or an undertaking should manage long reaction times, non-concurrent structure ought to work.

- Aio-http
- Quart
- Tornado
- Fast API
- Sanic
- Vibora

We have decided to use Flask Micro-framework for our application.

Flask is a lightweight popular Python WSGI web application framework. It is intended to make beginning fast and simple, with the capacity to scale up to complex applications. It started as a basic wrapper around Werkzeug and Jinja and has turned out to be one of the most well known Python web application systems.

It is viewed as more Pythonic than the Django web system on the grounds that in like manner circumstances the identical Flask web application is increasingly express.

Flask offers proposals, yet doesn't uphold any conditions or venture format. It is dependent upon the engineer to pick the apparatuses and libraries they need to utilize. There are numerous expansions given by the network that make including new usefulness simple.

Applications that use the Flask framework include Pinterest LinkedIn and the community web page for Flask itself.

Important Features That Make Flask Micro-framework our micro-framework of Choice

- Easy to get started
- Little Boilerplate code needed
- built-in development server and fast debugger
- provides simplicity, flexibility and fine-grained control.
- Jinja2 templating

CHAPTER 4

4.1 DATA FLOW DIAGRAM

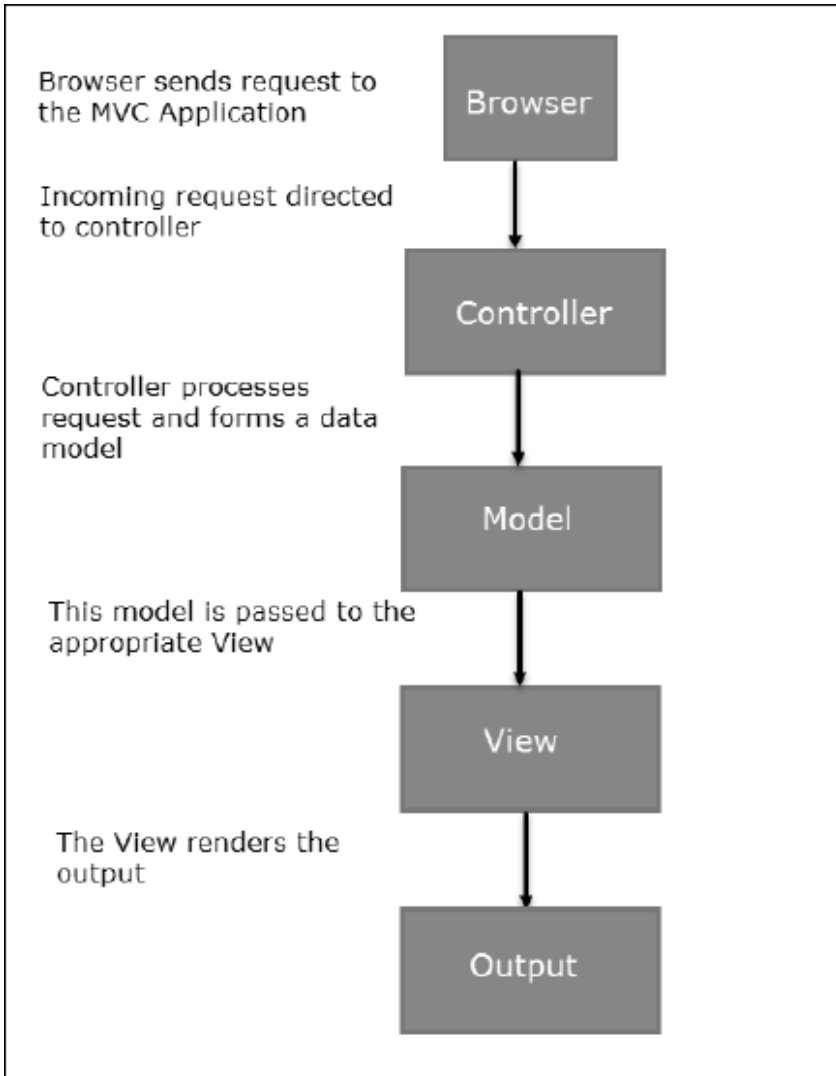


Fig.4.1 Data Flow Diagram

Flow Steps

Step 1 – The client browser sends request to the MVC Application.

Step 2 – Global.ascx receives this request and performs routing based on the URL of the incoming request using the RouteTable, RouteData, UrlRoutingModule and MvcRouteHandler objects.

Step 3 – This routing operation calls the appropriate controller and executes it using the IControllerFactory object and MvcHandler object's Execute method.

Step 4 – The Controller processes the data using Model and invokes the appropriate method using ControllerActionInvoker object

Step 5 – The processed Model is then passed to the View, which in turn renders the final output.

4.2 CONSENSUS ALGORITHM

Blockchain is a distributed decentralized network that provides immutability, privacy, security, and transparency. There is no central authority present to validate and verify the transactions, yet every transaction in the Blockchain is considered to be completely secured and verified. This is possible only because of the presence of the consensus protocol which is a core part of any Blockchain network.

A consensus algorithm is a procedure through which all the peers of the Blockchain network reach a common agreement about the present state of the distributed ledger. In this way, consensus algorithms achieve reliability in the Blockchain network and establish trust between unknown peers in a distributed computing environment. Essentially, the consensus protocol makes sure that every new block that is added to the Blockchain is the one and only version of the truth that is agreed upon by all the nodes in the Blockchain.

The Blockchain consensus protocol consists of some specific objectives such as coming to an agreement, collaboration, co-operation, equal rights to every node, and mandatory participation of each node in the consensus process. Thus, a consensus algorithm aims at finding a common agreement that is a win for the entire network. Now, we will discuss various consensus algorithms and how they work.

Proof of Work (PoW):

This consensus algorithm is used to select a miner for the next block generation. Bitcoin uses this PoW consensus algorithm. The central idea behind this algorithm is to solve a complex mathematical puzzle and easily give out a solution. This mathematical puzzle requires a lot of computational power and thus,

the node who solves the puzzle as soon as possible gets to mine the next block. For more details on PoW, please read Proof of Work (PoW) Consensus

Proof of Stake (PoS):

This is the most common alternative to PoW. Ethereum has shifted from PoW to PoS consensus. In this type of consensus algorithm, instead of investing in expensive hardware to solve a complex puzzle, validators invest in the coins of the system by locking up some of their coins as stake. After that, all the validators will start validating the blocks. Validators will validate blocks by placing a bet on it if they discover a block which they think can be added to the chain. Based on the actual blocks added in the Blockchain, all the validators get a reward proportionate to their bets and their stake increase accordingly. In the end, a validator is chosen to generate a new block based on their economic stake in the network. Thus, PoS encourages validators through an incentive mechanism to reach to an agreement.

Proof of Burn (PoB):

With PoB, instead of investing into expensive hardware equipment, validators 'burn' coins by sending them to an address from where they are irretrievable. By committing the coins to an unreachable address, validators earn a privilege to mine on the system based on a random selection process. Thus, burning coins here means that validators have a long-term commitment in exchange for their short-term loss.

4.3 Components of a Block

Previous Hash

The previous hash is the attribute that connects a block to its previous block. It consists of the hash value of the previous block.

Data

This consists of the sender's address, the receiver's address, and the transaction amount. There could be multiple transactions among multiple senders and receivers, so each block consists of any number of transactions, and each transaction will have a sender's address, a receiver's address, and a transactional nonce.

Nonce

Bitcoin uses a proof-of-work algorithm, and to execute the algorithm, a random value is used to vary the output of the hash value; this is called the nonce. Proof of work is the process of transaction verification.

Hash

The hash is like a digital fingerprint. To get the hash for the current block, the process takes an input value (the previous hash, the data, and the nonce) and produces an output value of a fixed length. Bitcoin uses the SHA-256 hashing algorithm to generate a 256-bit-length hash. It looks something like a hexadecimal value.

Public Distributed Ledger

To recap, a blockchain is a decentralized public distributed ledger that is used to record transactions across many computers. For example, user A transfers money to user B, user B transfers to C, and C transfers to B. A distributed ledger is a database that is shared among all the users who are part of the blockchain network. The transactions are accessed and verified by users of the bitcoin network, thereby making it less prone to a cyber attack.

Let's take an example in which bitcoin users are transferring money: Bella is trying to transfer money to John, John is trying to transfer money to Elsa, and Elsa is trying to transfer money to Jack. So these are the three transactions to be initiated.

If these transactions were happening on a central ledger, it could get corrupted, and there is the chance of data tampering. To solve this problem, a public distributed ledger plays a vital role: It ensures that each user who is part of the cycle has a copy of the transaction details. In our example, Bella, John, Elsa, and Jack all have the same ledger—the distributed ledger.

4.4 Encryption

Blockchain eliminates unauthorized access by using the cryptographic algorithm SHA-256 to ensure that the blocks are kept secure. Each user in the blockchain has his or her keys: a private one and a public one. The private key is known only to the sender; it is also used to confirm if the origin of the transaction is legitimate. The public key is also used to identify the user uniquely, but the sender shares it with every transaction. It floats on the blockchain network.

Let's take a look at a typical transaction verification process. Suppose a sender wants to send a message. The sender will pass the message through the hash function and generate a hash value of the message. After the hash value has been created, it is passed through a signature algorithm, and with the private key, a digitally signed document is created.

The original message, the digitally signed document, and the public key are then transmitted to the receiver. At the receiver's end, the transaction message is passed through a hash function to get a hash value, and that hash value is compared with the hash value obtained bypassing the digital signature and public key through a verification function.

The hash function creates a unique digital fingerprint of data. The message is passed through the hashing function, and it generates a hash value. This hash value is called a digital print, and it has a unique property: Any hashing function is a one-way function; it cannot be reversed. You cannot decode the original value from the hashed value.

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 OUTPUT

Toward smart cities communities to comprehend the block chain arrangement, we outline the highlights of the administration and figuring of block chain-based sharing administrations. The dynamic of individuals being sans trust in block chain business administrations depends on straightforwardness and security in the administration connection among human and innovation.

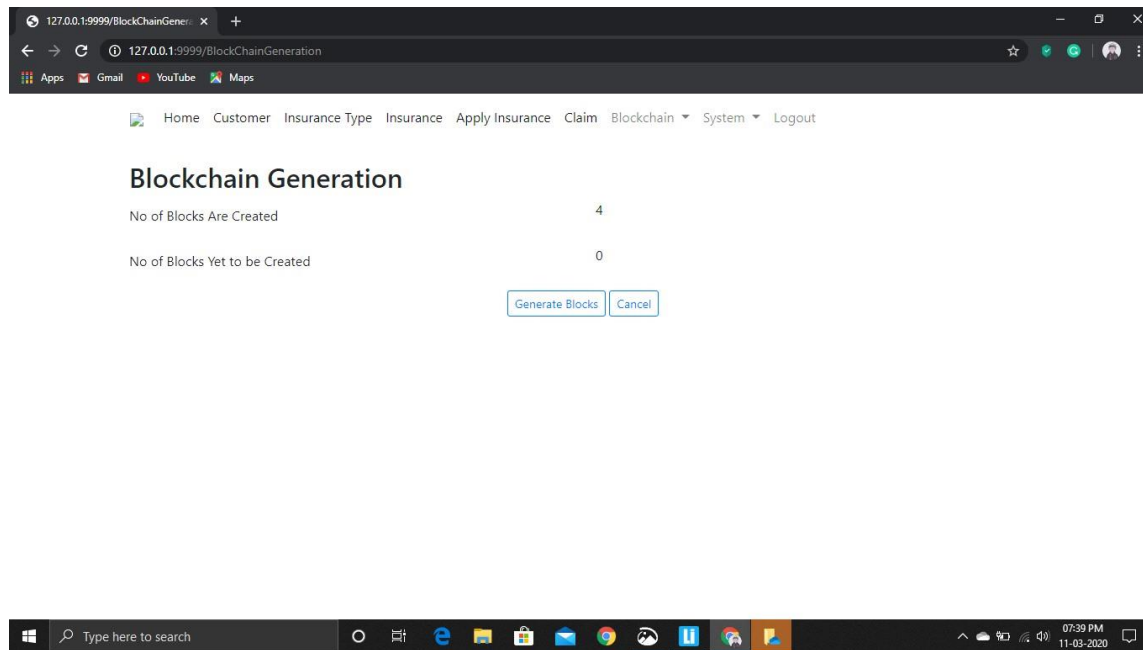


Fig. 5.1 Creation of blocks

The creation of blocks has done properly with the respective insurance type of listing where all type of insurance credentials are stored to the database, where claiming process will be successful after the blockchain generation and report as shown in the figures below.

Here, the application is used to provide security for the credentials for the insurance claiming details. In this proposed work we are add encryption key with consensus algorithm of type proof of work which creates unique identity for the database. So, if any one tend to change the records which is not possible.

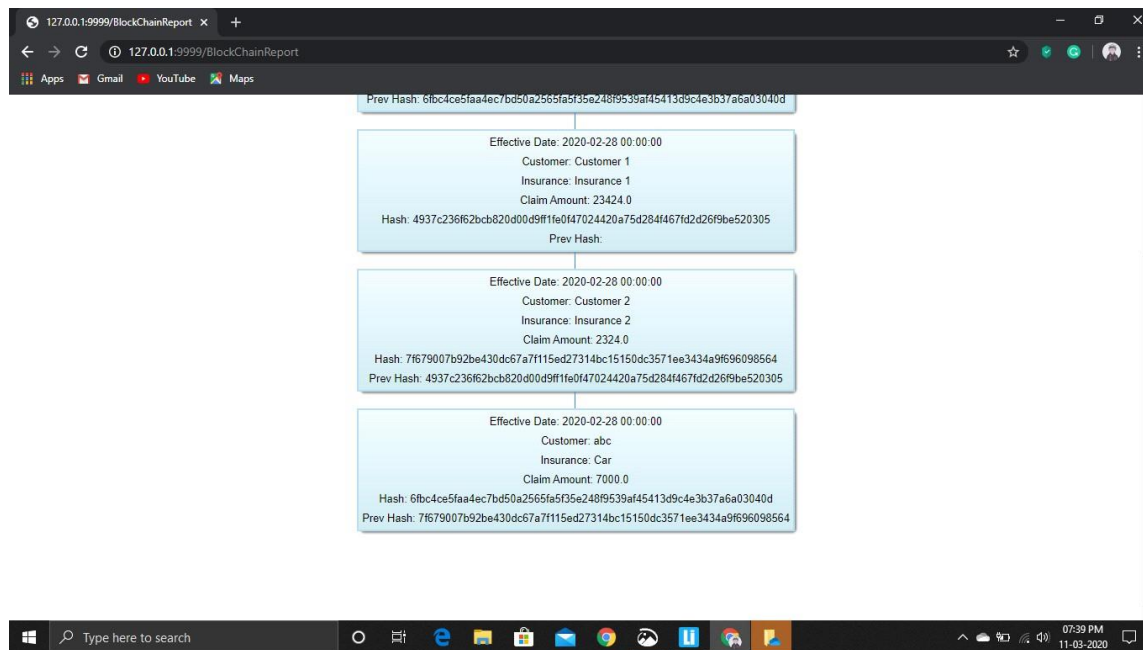


Fig. 5.2 Blocks Generation

Clearly, for the fourth generation blockchain projects, the possibilities seem to be enormous. Even as previously unseen solutions to the scalability issues keep emerging, some new projects promise to transform the very terrain of blockchain by coming up with mass-friendly, more pragmatic features. The fourth generation of blockchain, whatever it may look like, will not be monotonous. It will be variegated, radical, exciting and unique. As new doors open up and whitepapers give us more food for thought.

CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 CONCLUSION

As the web of things built up, the trouble of overseeing hub gadget additionally expanded. Particularly for cities communities, a system of different gadgets in a wide zone can cause numerous vulnerabilities because of the multifaceted nature of the system. Nonetheless, the city arrange, which is legitimately associated with the national and social foundation, requires a significant level of security because of its administration attributes. Along these lines, a shrewd city comprising of heterogeneous gadgets must be secure, guaranteeing uprightness, privacy and information accessibility. Likewise, validation, inertness, flexibility and auditability on hub gadgets ought to be considered. The basic purpose of system the executives is gadget the board. Every gadget ought to consistently be in a protected state and issues happening on every gadget ought to be accounted for right away. Brought together foundation based structures may not accomplish these objectives and inappropriate administration and refreshing of gadgets can bring about critical misfortunes to shrewd city, requiring convenient, secure and ensured gadget refreshes.

6.2 FUTURE SCOPE

In this work we have proposed a sharing economy framework, which use the Blockchain and off-anchor structure to store unchanging records. With the help of our proposed AI framework, a group of people yet to come city can offer digital physical sharing economy benefits through IoT information. By utilizing keen agreements, the system can offer complex spatio-fleeting administrations to a worldwide level without requiring a focal check authority.

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APPENDIX

SAMPLE CODE:

```
from flask import Flask, request, render_template, redirect, url_for, session
import os
import pypyodbc
import datetime
```

```
from RoleModel import RoleModel
from UserModel import UserModel
from Constants import connString
```

```
app = Flask(__name_)
app.secret_key = "MySecret"
ctx = app.app_context()
ctx.push()
```

```
with ctx:
    pass
```

```
userName = ""
roleObject = None
message = ""
msgType = ""
```

```
def initialize():
    global message, msgType
    message = ""
    msgType=""
```

```
def processRole(optionID):

    if optionID == 10 :
        if roleObject.canRole == False :
            return False
    if optionID == 20 :
        if roleObject.canUser == False :
            return False
    if optionID == 30 :
        if roleObject.CL111 == False :
            return False
    if optionID == 40 :
        if roleObject.CL222 == False :
```

```

        return False
    if optionID == 50 :
        if roleObject.CL333 == False :
            return False
    return True

@app.route('/')
def index():
    global userID, userName
    return render_template('Login.html') # when the home page is called Index.html will be triggered.

@app.route('/processLogin', methods=['POST'])
def processLogin():
    global userID, userName, roleObject
    userName= request.form['userName']
    password= request.form['password']
    conn1 = pypyodbc.connect(connString, autocommit=True)
    cur1 = conn1.cursor()
    sqlcmd1 = "SELECT * FROM UserTable WHERE userName = '"+userName+"' AND password = '"+password+"' AND isActive = 1";

    cur1.execute(sqlcmd1)
    row = cur1.fetchone()

    cur1.commit()
    if not row:
        return render_template('Login.html', processResult="Invalid Credentials")
    userID = row[0]
    userName = row[3]

    cur2 = conn1.cursor()
    sqlcmd2 = "SELECT * FROM Role WHERE RoleID = '"+str(row[6])+"'";
    cur2.execute(sqlcmd2)
    row2 = cur2.fetchone()

    if not row2:
        return render_template('Login.html', processResult="Invalid Role")

    roleObject = RoleModel(row2[0], row2[1],row2[2],row2[3],row2[4],row2[5])

    return render_template('Dashboard.html')

@app.route("/ChangePassword")
def changePassword():
    global userID, userName
    return render_template('ChangePassword.html')

@app.route("/ProcessChangePassword", methods=['POST'])
def processChangePassword():
    global userID, userName

```

```

oldPassword= request.form['oldPassword']
newPassword= request.form['newPassword']
confirmPassword= request.form['confirmPassword']
conn1 = pypyodbc.connect(connString, autocommit=True)
cur1 = conn1.cursor()
sqlcmd1 = "SELECT * FROM UserTable WHERE userName = '"+userName+"' AND password =
 '"+oldPassword+"'";
cur1.execute(sqlcmd1)
row = cur1.fetchone()
cur1.commit()
if not row:
    return render_template('ChangePassword.html', msg="Invalid Old Password")

if newPassword.strip() != confirmPassword.strip() :
    return render_template('ChangePassword.html', msg="New Password and Confirm Password are
    NOT same")

conn2 = pypyodbc.connect(connString, autocommit=True)
cur2 = conn2.cursor()
sqlcmd2 = "UPDATE UserTable SET password = '"+newPassword+"' WHERE userName =
 '"+userName+"'";
cur1.execute(sqlcmd2)
cur2.commit()
return render_template('ChangePassword.html', msg="Password Changed Successfully")

```

```

@app.route("/Dashboard")
def Dashboard():
    global userID, userName
    return render_template('Dashboard.html')

```

```

@app.route("/Information")
def Information():
    global message, msgType
    return render_template('Information.html', msgType=msgType, message = message)

```

```

@app.route("/UserListing")

def UserListing():
    global userID, userName

    global message, msgType, roleObject
    if roleObject == None:
        message = "Application Error Occurred"
        msgType="Error"
        return redirect(url_for('Information'))

```

```

canRole = processRole(10)

if canRole == False:
    message = "You Don't Have Permission to Access User"
    msgType="Error"
    return redirect(url_for('Information'))

conn2 = pypyodbc.connect(connString, autocommit=True)
cursor = conn2.cursor()
sqlcmd1 = "SELECT * FROM UserTable ORDER BY userName"
cursor.execute(sqlcmd1)
records = []

while True:
    dbrow = cursor.fetchone()
    if not dbrow:
        break

    conn3 = pypyodbc.connect(connString, autocommit=True)
    cursor3 = conn3.cursor()
    temp = str(dbrow[6])
    sqlcmd3 = "SELECT * FROM Role WHERE RoleID = '"+temp+"'"
    cursor3.execute(sqlcmd3)
    rolerow = cursor3.fetchone()
    roleModel = RoleModel(0)
    if rolerow:
        _____roleModel = RoleModel(rolerow[0],rolerow[1])
    else:
        _____print("Role Row is Not Available")

    row = UserModel(dbrow[0], dbrow[1], dbrow[2], dbrow[3], dbrow[4], dbrow[5], dbrow[6],
roleModel=roleModel)
    records.append(row)
    return render_template('UserListing.html', records=records)

@app.route("/UserOperation")
def UserOperation():

    global userID, userName

    global message, msgType, roleObject
    if roleObject == None:
        message = "Application Error Occurred"
        msgType="Error"
        return redirect(url_for('Information'))
    canRole = processRole(10)

    if canRole == False:
        message = "You Don't Have Permission to Access User"

```



```

    return render_template('UserOperation.html', row = row, operation=operation, rolesDDLlist=rolesDDLlist
)

```

```

@app.route("/ProcessUserOperation", methods = ['POST'])

```

```

def processUserOperation():

```

```

    global userName, userID

```

```

    operation = request.form['operation']

```

```

    unqid = request.form['unqid'].strip()

```

```

    userName= request.form['userName']

```

```

    emailid= request.form['emailid']

```

```

    password=request.form['password']

```

```

    contactNo= request.form['contactNo']

```

```

    isActive = 0

```

```

    if request.form.get("isActive") != None :

```

```

        isActive = 1

```

```

    roleID= request.form['roleID']

```

```

    conn1 = pypyodbc.connect(connString, autocommit=True)

```

```

    cur1 = conn1.cursor()

```

```

    if operation == "Create" :

```

```

        sqlcmd = "INSERT INTO UserTable( userName,emailid, password,contactNo, isActive, roleID)
VALUES('"+userName+"','"+emailid+"', '"+contactNo+"', '"+password+"', '"+str(isActive)+"',
 '"+str(roleID)+"')"
```

```

    if operation == "Edit" :

```

```

        sqlcmd = "UPDATE UserTable SET userName = '"+userName+"', emailid = '"+emailid+"', password
= '"+password+"',contactNo='"+contactNo+"', isActive = '"+str(isActive)+"', roleID = '"+str(roleID)+"'
WHERE UserID = '"+unqid+"'"

```

```

    if operation == "Delete" :

```

```

        sqlcmd = "DELETE FROM UserTable WHERE UserID = '"+unqid+"'"

```

```

    if sqlcmd == "" :

```

```

        return redirect(url_for('Information'))

```

```

    cur1.execute(sqlcmd)

```

```

    cur1.commit()

```

```

    conn1.close()

```

```

    return redirect(url_for("UserListing"))

```

C) PUBLICATION:

Battula Chandini[1], Mamillapalli Vishnu Vardhani[2]
[1][2] UG Student, Dept. of Computer Science, Sathyabama University,
Chennai, India

Dr. G. Nagarajan, M.E., Ph.D.,
Assistant professor, Dept. of Computer Science, Sathyabama University,
Chennai, India

Abstract- *The drastically arranged intelligent city prepare calls for an assortment of security contemplation's for a heterogeneous gizmo condition. As of past due, innovation new agencies have utilized the functionality of block chain-based totally improvements to manage agencies or relational trust by means of upholding marked agreement amongst numerous people in a decentralized state of affairs. In any casing, it will be hard sufficient persuading that the block-chain innovation should absolutely supplant the trust among changing associate the communion saving as sharing disposal consistently paintings in a profoundly powerful circumstance. With the fast growing of the lease securities industry, the sharing saving faces an ever growing number of serious problems as administrative vulnerability and concerns about unwell-usage. Block-chain records trustworthiness. Besides, block-chain's unchanging nature develops a effective area for making superb, perpetual and developing data units for profound getting to know. The mixture of ai and block-chain could have an effect on fields like net of things (iot), man or woman, money related markets, not unusual management, terrific towns regions, little networks, supply chains, customized remedy and distinctive fields, and along these strains convey blessings to numerous individuals. On this suggest paintings a flask framework to offer co-lateral agreement of administrations for the reasonable net of factors (iot) empowered sharing financial system in superb shrewd towns groups utilising convolutional neural system.*

Keywords: *Smart city, Blockchain, Sharing economy, Internet of Things (IoT), Smart contract*

I INTRODUCTION

The continuing progress in information technology have breakthrough traditional personal communication helped industry to be highlighted of data driven basic headship [1]. Throughout the outlook at Internet of Things accept a important role of registering substructure thus designing a Cyber-Physical System (CPS). Blockchain can strengthen different modern implementation, for instance, producing, correlate, production and services. IoT expects to improve activity proficiency and generation throughput, decrease the machine personal time and upgrade item quality. Specifically, IoT has the accompanying highlights: 1) redistribution of of blockchain subsets, 2) assorted variety of gadgets and schemes, 3) heterogeneity of IoT information and 4) organize intricacy. Every one of them bring about the difficulties including heterogeneity of IoT framework, poor interoperability, asset imperatives of IoT gadgets, protection and security vulnerabilities. The existence of iot developments gains the conquering of above challenge of IoT. With the decentralized agreement, blockchains can empower an exchange to happen and be approved in a commonly questioned appropriated framework without the intercession of the confided in outsider. Dissimilar to occupant exchange the executives frameworks where the incorporated office needs to approve the exchange, blockchains can accomplish the decentralized approval of exchanges, along these lines incredibly sparing the expense and

relieving the exhibition bottleneck at the focal office. Additionally, every exchange spared in blockchains is basically unchanging since every hub in the system keeps all the submitted exchanges in the blockchain. In the mean time, cryptographic systems, (for example, deviated encryption calculations, computerized mark and hash capacities) ensure the uprightness of information obstructs in the blockchains. Along these lines, the blockchains can guarantee non-denial of exchanges. What's more, every exchange in blockchains is recognizable to each client with the appended memorable timestamp.

Iot for virtual bodily frameworks, decentralized data stockpiling figuring thru cloudlets, and blockchain-based decentralized safety empower the arrangement of putting mindful, custom designed, and canny sharing economy administrations to a big clever town swarm. Cutting aspect clever cities areas will confront the take a look at of the combination of those headways wherein a sizeable degree of information may be created by means of the mass institution [17] and iot gadgets frequently. These information need to be processed, dealt with, and reacted to in a safe and subjective manner. After the innovation of www, the difficult improvements that have contacted pretty lots every part of the processing space include the presentation of decentralized records exchanges making use of blockchain, iot, and device insight at the versatile edge. Every considered one of them cooperate to offer clever town sharing economic system arrangements wherein factors play out an trade in a total decentralized manner with no middle confided in birthday celebration [1]. At the supply facet, people can provide matters[2] along with brief-time[3] period rentals [4] in their idle vehicles, or spare rooms of their apartments or homes.

Sharing economy can use various elements of the proposed research[5]. With regards to transportation[6] administrations, Blockchain can store the driver and vehicle profile with the historical backdrop of upkeep, mishap[7], move, and different kinds of changeless[8] information Furthermore, it can likewise interface[9] the partners of vehicle by a common chain, giving assistance[10] via vehicle splitting the financial situation [11]. Blockchain and medicinal IoT can possibly interconnect every one of the networks of enthusiasm of specially appointed wellbeing basedsharing economy online networking administrations [34]. Being instance, they will permit the voltaic wellbeing record (EHR), cathodic medicinal record (EMR), client outline, medical coverage description, singular therapeutic trial antiquity, subtleties of visits to various emergency clinics, and contour of doctors and medical clinics to be spared in a regionalize and certain vault [13]. Particular serious issues looked by the allocating providence is the one of a kind character the executives and confirmation of every partner in a protected and unknown manner [25]. Blockchain affords a encouraging arrangement through giving sealed character the board; approval of IoT gadget profiles and other computerized marks, accordingly permitting worldwide personality for sharing economy situations. Blockchain's brilliant agreements can robotize self-executing understandings that were to a great extent hypothetical before the presentation of Blockchain [15].

These arrangements will guarantee an adaptable enormous information age, imparting after isolated spectre , consolidate or disseminate in a bright town. Be that as it may, information preparing and occasion identification in various situations are an overwhelming assignment as the measure of information is at an enormously huge scale [9]. Breaking down aforesaid a complete magnitude of information and deciding the marvels of premium [10] boundary and threat are conceivable because of the headway in fast exchange ability as an overlay over existing Blockchain systems, subjective registering capacities with Artificial knowledge (AI), with the help of equivalence AI, profound training, and different sorts of information science progressions.

II RELATED WORK

Loper et al[1] presently, there was enormous enthusiasm for the not unusual economic device packages, in which humans can adapt their things . The sharing financial gadget has encountered rushes of hyper excitement, but it still cannot appear to reach at its maximum ability. The big majority of the route of movement of ranges, as an example, airbnb and uber count on a interest as middle human beings among clients and personal belongings. The blockchain is expressed to furnish a basis with the possibility to type out absolutely decentralized markets.

Pautasso et al [2]. An ongoing discourse paper through ibm precise that blockchains can in all likelihood make a "sharing economic gadget 2.0" through decentralizing agree with additionally, a amazing part of the scholarly writing recommends the blockchain innovation to defeat believe-associated problems and consequently to feature to the goals of one of the main difficulties of the dispensed markets and sharing economic machine bodily sports.

Beenest [3] is one startup that goals enhancing the residence-sharing financial system through killing the phrases of administration and expenses received by the added together specialists making use of the blockchain innovation. On this new model, the ones hosts with keep rooms or houses can straightforwardly interface with the customers seeking out agreement, without delegate charging or misusing its customer's facts. Slock.It [6] is a version that had a few knowledge in blockchain and iot packages to understand szabo's vision of clever contracts implanted in iot-empowered devices.

Helbiz [4] is a number one defender of this financial version for transportation by way of consolidating the automobile innovation. The technical fills in as a course for the administrations gave thru helbiz's foundation, consequently coping with exchanges among directors, owners, and outside expert co-ops. Typically superior due to the fact the "blockchain rendition of uber," l. A.'zooz' plans to manufacture an open-source, around the area, decentralized adventure-sharing tool, to assignment and alternate the constructed up non-public transpiration frameworks with big quantities of squandered void seats and payload area [8]. Arcade city [9] is each other decentralized ride-sharing help primarily based things. It interfaces up drivers and travelers and offers a trip in a similar way uber does. With the exception of those new businesses, a few plan technological information processes get the concept of the blockchain and flow the concept of middle man or woman loose degrees to capacity application settings.

For example, **bogner [10]** proposes a evidence of idea to reveal off how applications empower every day sharing. The creators built the sensible agreement on the smart agreement, which permits proprietors to sign on and lease devices with out a confided in outsider association. Be that as it can, a blockchain-based totally framework spills safety facts of the protected gatherings because of its receptiveness to fashionable society, and a protection regarding approach is proposed to authorize understandings amongst owners and real clients of merchandise, **xu et al [11]**.

Notheisen et al [12] gift a decentralized sans believe change framework that permits clients to move genuine assets without a focal vault. Moreover, they propose to apply the changeless file to moderate the educational sided exchanges.

Rahman et al[13] recommend a foundation for the internet of things empowered sharing economy in uber clever towns communities. The proposed basis use the intellectual figuring and rancid-chain based totally decentralized records stockpiling for a big institution. Dorri et al[14] gift a conveyed solution for make sure the safety of customers and to the safety of the automobile organic device. The proposed safety layout is famously appropriate for vehicle sharing administrations, which require a believed correspondence channel to change data together with the vicinity of the car, keys to open the car, and installment subtleties of the client.

Albeit amazing exertion antique directed, the winning examination exist initial issue assist allocating providence administrations with the guide as regards subjective figuring and taut blockchain-and offchain-hinge separate facts stockpiling as a giant group. Within powerful following section, we supply the condition phrasings along with essential statistics territories identified with the examination.

III SMART TOWNS AND THE SHARING ECONOMY

On the inventory aspect, humans can provide matters, as an instance, brief leases of their inactive vehicles, or more rooms in their condos or homes. At the interest facet, buyers can income through leasing products at decrease fee or with lower price-based totally overhead than shopping or leasing thru a traditional provider

The sharing financial system has made various open doors for clever towns areas concerning enhancing resource use and effectively lessening change charges. Enhancing the usage of advantages infers various nice results, for example, vitality sparing and blockage diminishing. Whilst sharing products and ventures in business facilities has a long records, and antiquated vis-à-vis sharing still happens in networks throughout, internet center people might now be able to assist those exchanges and in shape market interest continuously on an huge scale.

The sharing economy is pushed by using empowering advancements of computerized network, which offer the established order of these traits as in it lets in promptness (gori et al. 2015). Steady statistics and information assembled through human beings are critical to dealing with the wasteful usage of beneath-used assets and creating a metropolis "keen." citizens, items communities can interface up flawlessly by making use of commonplace advances to essentially improve information sharing with respect to the status and trade of inert assets. With advanced availability, people can hire save rooms and cellars, retain parking spots full, experience an inert motorcycle in the road, and take a mutual taxi with a extra atypical heading a comparable way.

IV EXISITNG SYSTEM

Haze processing framework is a developing engineering for giving registering, stockpiling, control, and systems administration abilities for acknowledging Internet-of-Things (IoT). In the haze figuring framework, the cell phones (MDs) can offload its information or computational costly errands to the haze hub inside its nearness, rather than far off cloud. Despite the fact that offloading can decrease vitality utilization at the MDs, it might likewise acquire a bigger execution delay including transmission time between the MDs and the mist/cloud servers, and pausing and execution time at the servers. Consequently, how to adjust the vitality utilization and defer execution is of research significance. Broad reproduction considers are directed to show the adequacy of the proposed plan and the better execution more than a few existed plans are watched.

4.1 DISADVANTAGES OF THE EXISTING SYSTEM

- This sets aside more effort to process
- This furnish just reproduction result not with ongoing procedure

V

PROPOSED FRAMEWORK

Intellectual registering depends on the human perspectives, and it confers this knowledge to various electronic frameworks. Intellectual registering is made out of programmed AI systems that utilization information examination, design acknowledgment, and characteristic language handling to think like people. At the point when prepared, these frameworks don't need human support. The subjective motor is like incredible cerebrums that drive the circulated IoT gadgets. This new mind can look over tremendous information assets and assemble knowledge that is required for basic leadership and future activities. These psychological motors have amazing investigation capacity and information preparing competency that bestows mortal like knowledge attentive Blockchain structures.

Mechanized Blockchain construct dispense scrimping benefits, the money related exchanges and administrations are computerized and wisely oversaw by the subjective motor. The partners take an interest in confided in tasks where the understanding is examined by the psychological framework, and the commitments live prosecute naturally in the absebece of an individual contribution. Corresponding elegant understanding or agreement is made out of immovable cipher, which manages supplementary comparable brilliant agreements. Such a framework can settle on astute choice, perform information investigation, and utilize Near-field correspondence (NFC), or area data for IoT gadgets during radiate inherent information to circulated apportion of Blockchain records. Simulated intelligence operators are accessible to oversee such self-ruling frameworks with circulated IoT gadgets. Consequently, Blockchain ground carve up parsimony administrations and AI operators model dealings by utilizing astute agreements.

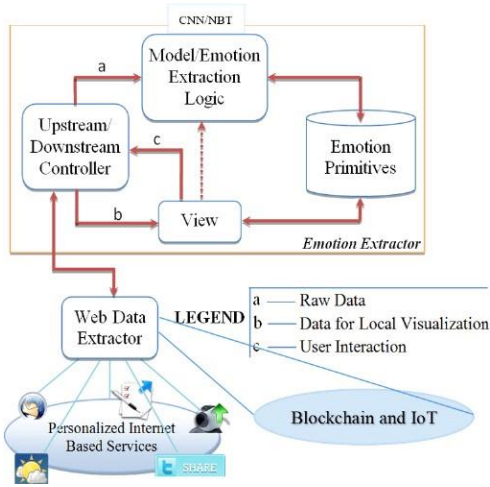


FIG 1 OVERVIEW OF THE PROPOSED SYSTEM

5.1 ADVANTAGES OF THE PROPOSED SYSTEM

- The normal postponement is seen as inside the passable range
- We imagine to inspect diverse parcel frugal situations at an enormous scute in Hajj 2019 and Hajj 2020.

VI RESULT AND DISCUSSION

Towards clever cities groups to recognise the blockchain association. The dynamic of people being sans agree with in blockchain enterprise administrations relies upon on straightforwardness and protection in the administration connection amongst human and innovation. Blockchain innovation empowers individuals to get to the facts of every alternate they make, because it for all time facts trade records at every hub of the blockchain. Due to the adjustment inside the accept as true with version of blockchain-primarily based framework, the administration connection additives of human and affiliation totally sharing administrations has come to be democratized. In blockchain-primarily based sharing administrations, accept as true with isn't always put in an individual, but as an alternative dispersed over the entire populace. The usage of focal experts is supplanted by a community of buddies as a shared gadget; nobody can singularly take activities within the hobby of the network. In such a democratized putting, governments can't control a political decision through pressuring human beings, and firms can not singularly defy the pointers of the framework.

Computerization is totally sharing administrations is the most striking component of management connections institutions. In view of the highlights of being sans trust, blockchain innovation has empowered business exchanges with outsiders without the requirement confided in center person; within the period in-between, programming can computerize a outstanding a part of the alternate process, enabling authoritative vows to be carried out without human affiliation. The robotization of working collectively in blockchain-based totally commercial enterprise administrations has pulled in noteworthy enthusiasm for one-of-a-kind ventures.

VII CONCLUSION

As the web of things built up, the trouble of overseeing hub gadget additionally expanded. Particularly for cities communities, a system of different gadgets in a wide zone can cause numerous vulnerabilities because of the multifaceted nature of the system. Nonetheless, the city arrange, which is legitimately associated with the national and social foundation, requires a significant level of security because of its administration attributes. Along these lines, a shrewd city comprising of heterogeneous gadgets must be secure, guaranteeing uprightness, privacy and information accessibility. Likewise, validation,

inertness, flexibility and auditability on hub gadgets ought to be considered. The basic purpose of system the executives is gadget the board. Every gadget ought to consistently be in a protected state and issues happening on every gadget ought to be accounted for right away. Brought together foundation based structures may not accomplish these objectives and inappropriate administration and refreshing of gadgets can bring about critical misfortunes to shrewd city, requiring convenient, secure and ensured gadget refreshes.

This paper has proposed a blockchain-based gadget the executives system that can accomplish the different security contemplations on the brilliant city. The proposed system utilizes private blockchain that reliably examines the respectability of the gadget and stores the outcomes gadget the executives. In this work we possess advocate a measure niggard framework, use the Blockchain and off-anchor structure concern pool unchanging records. Admist help of our proffered AI framework, a group of people yet to come burgh can purvey digital somatic ration sparing benefits through IoT information. Beyond utilizing keen agreements, the system occur fusion spatio-fleeting administrations to a worldwide pitch without entailing a focal check leverage.

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