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# Cognitive Edge Framework Insurance using Blockchain

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***Abstract:*** ***Blockchain-based infrastructure was employed in today's world to support security and privacy-oriented spatiotemporal smart contract services for sustainable Internet of Things (IoT)-enabled sharing economy in mega smart cities. The infrastructure leverages cognitive fog nodes at the sting to host and process offloaded geo-tagged multimedia payload uses AI for processing and extracting significant event information, produces semantic digital analytics, and saves ends up in Blockchain and decentralized cloud repositories to facilitate sharing economy services. The framework offers a sustainable incentive mechanism, which can potentially support secure smart city services, like sharing economy, smart contracts, and hyperphysical interaction with Blockchain. [1] Our unique contribution is justified by detailed system design and implementation of the framework. Sharing economy can leverage numerous dimensions of the proposed research. within the context of transportation services, Blockchain can store the thrust and car profile with the history of maintenance, accident, transfer, and other types of immutable data. Building trust through transparent and accurate data transactions and contract agreements is important during a very sharing economy service. This case requires developing a framework wherein parties can trust a shared record of events, related to sharing economy policies, despite not knowing each other. The advantage of Blockchain is that it is the potential to eliminate faults and errors further as detect fraudulent activity associated with falsified insurance data.[10]***
***Keywords: Blockchain, Internet of Things, Fraudulent, Insurance data, Hyperphysical Interaction***

## I. INTRODUCTION

Blockchain may be a secure series or chain of timestamped records stored in a very database that a gaggle of users manages who are an element of a decentralized network. Blockchain could be a decentralized or distributed ledger where each node within the network has access to the info or records stored in an exceedingly blockchain. The encryption of all the important data records within the blockchain is completed using cryptographic techniques. This ensures the protection of the information within the blockchain.

Industries have always adopted technology that has made it easier, faster and cheaper to conduct business. Blockchain technology promises to deliver on all three fronts, especially within the insurance industry, which is seen as slow and sophisticated. Insurance customers doesn't enjoy interacting with insurance companies.

Customers often handle time-consuming paper forms when applying for a policy or submitting a claim. they will should speak with people at insurance companies and hospitals, for instance, to urge medical insurance claims reimbursed. On the opposite side, insurance companies should house the high costs of managing and servicing policies. Many of those costs are administrative claims administration, verification and reconciliation of knowledge, and paperwork.

Insurance also requires coordination among many parties, consumers, brokers, insurers and reinsurers. This introduces overhead costs that translate to higher premiums paid by customers. Blockchain can help make selling and servicing insurance better, faster and cheaper by improving fraud prevention, claims management, insurance, and reinsurance. the top result can be lower prices and better experiences for patrons.[2]

The proposed system could be a sharing economy scenario where Blockchain has been at the centre of secure data sharing. Any claim process is often catered by incorporating medical facilities, government agencies, smart contracts, and IoT data with the help of AI and would allow automatic pay-outs to different beneficiaries.

Blockchain shows a promising solution because it can provide secure identity management, validation of user and other public profiles, and digital signatures, thereby allowing global identity for sharing economy scenarios Our system design enables seamless use of cash-less payment within a distant community that's intermittently connected to the bank's central network. We propose to use a non-public blockchain for transaction processing within the village, restricting mining rights to only a collection of qualified (trusted) users. We also create our own Token for money circulation within the local people that behave similarly to personal blockchain except they're issued via a sensible contract by the bank.

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Figure 1 shows the system architecture for Cognitive edge Framework Insurance. There are many kinds of architecture diagrams, like a software architecture diagram, system architecture diagram, application architecture diagram, security architecture diagram, etc.

In this architecture diagram, the medical, government agencies and IoT data are collected using suitable blockchain technology that consist of digital signature, validation of public profiles, validation of user and secure identity management. All the related values are passed to a block. The block contains one or more items, they also contain hash value and the input to the has value are the previous value from the block.

All the value from the block are transferred to a database called as public database ledger. They include all the user who are a part of the blockchain network. After that the transactions are accessed and verified by the users using bitcoin network. Unauthorised access is eliminated by cryptographic algorithm like SHA-26, which contains two keys such as Public and Private keys.[5]

For system developers, they need system architecture diagrams to understand, clarify, and communicate ideas about the system structure and the user requirements that the system must support. It's a basic framework can be used at the system planning phase helping partners understand the architecture, discuss changes, and communicate intentions clearly.

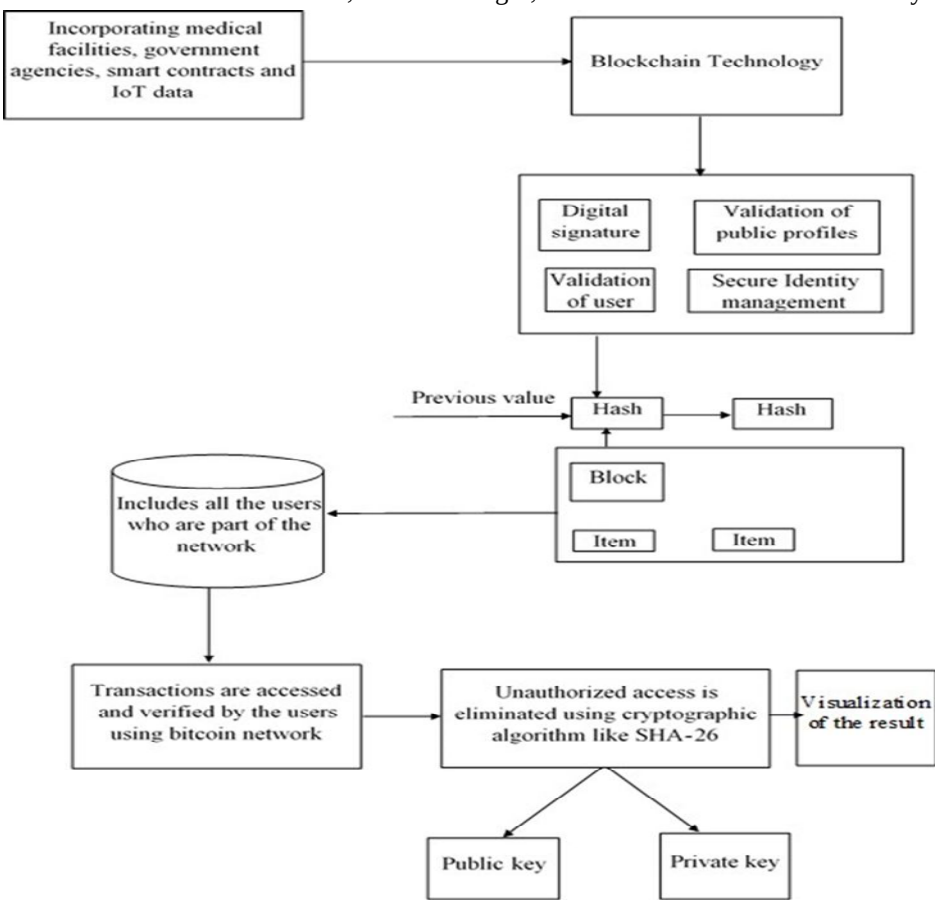


Figure 1: System architecture for Cognitive Edge Framework Insurance

## II. METHODOLOGY

### *A. Data Processing*

The most common format for data is CSV files. There are a number of ways to load a file in Python. The Python API provides the module and the function that can be used to load files. Once loaded, you convert the data to a NumPy array and use it for machine learning.

Pandas is a powerful data analysis package. It makes data exploration and manipulation easy. It has several functions to read data from various sources. You can load your data using Pandas and the pandas.read_csv() function. This function is very flexible and is perhaps my recommended approach for loading your data. The function returns a pandas. DataFrame that you can immediately start summarizing and plotting. The header in a file is used in automatically assigning names or labels to each column of your dataset. If your file doesn't have a header, you will have to manually name your attributes.[6]

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Comments in a file can be identified when a line starts with a hash sign (#). Depending on the method you choose to load your data, you will have to determine if you want these comments to show up, and how you can identify them.
A delimiter separates multiple values in a field and is indicated by the comma (,). The tab (\t) is another delimiter that you can use, but you have to specify it clearly.
If field values in your file contain spaces, these values are often quoted and the symbol that denotes this is double quotation mark's. If you choose to use other characters, you need to specify this in your file.

*B. Data Maintenance*

Customer Maintenance includes activities associated with entering a replacement customer into the customer database, updating customer information, and viewing or printing customer information. Customer Maintenance is often initiated when an employee performs a register transaction and discovers that the customer's name isn't within the database and must be entered for the primary time. Customer maintenance is additionally required when customer information is found to be incorrect and must be changed, or when it's incomplete and extra data must be entered.
Specify the entire name of the customer during this field. You furthermore should maintain the non-public details so as to work out the road. Capture and track supplier information to make sure that you just can satisfy suppliers by having the answers to their questions at your fingertips. [6] you'll be able to enter straightforward or complex supplier definitions that capture an organization's true relationship with a supplier. You will also enter information from conversations with suppliers to manage your contacts more effectively.

*C. Blockchain Generation*

Data Blocks are formed by bundling together variety of knowledge transactions and every block is linked to its predecessor by a hash. A hash could be a fixed-length numeric value that relates to the previous block data. Additionally, each Data block features a timestamp indicating when it absolutely was created, a signature proving its correctness and integrity, and a random number (nonce) for cryptographic operations.
The signature and nonce allow Data blocks to be immutable whether or not they're publicly accessible. The blockchain's network consists of the many distributed nodes that maintain the database in an exceedingly peer-to-peer network. Nodes have access to the blocks; however, they can't change them. The blockchain technology allows nodes to speak without a trusted broker or a trusted third party. [7]
When a node wants to interact with another, it sends its interaction within the type of a knowledge transaction. Many such transactions are collected to create a knowledge block. An information block is verified by everyone and is added to the chain if it's valid. Blockchains use sophisticated cryptographic techniques, leading to guaranteed security by signature schemes and possible encryption schemes. They're immutable as nobody can change, delete or tamper Data transactions. Finally, they supply non-repudiation guarantees thanks to Data transactions and blocks being signed using elegant signature schemes.

*D. Components Of Cognitive Edge Framework Insurance*

1) *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.
2) *Data:* Data 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.
3) *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.
4) *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.
5) *Public Distributed Ledger:* user A transfer's 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.
6) *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.

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*E. 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. [9] They automate the implementation of redundant tasks or extensions for common operations, reduces the development and testing time and allowing programmers to concentration to more on application logic instead of routine works.

*F. Flash Micro Framework*

Flask is also a light-weight popular Python WSGI web application framework. It's intended to make beginning ,fast and simple, with the capacity to proportion to complex applications. 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's dependent upon the engineer to settle on 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 so the community website for Flask itself.

*1)* Easy to get started
*2)* Little Boilerplate code needed
*3)* Built-in development server and fast debugger
*4)* Provides simplicity, flexibility and fine-grained control.
*5)* Jinja2 templating

## III.RESULTS AND DISCUSSION

*A. Login Page*

In the Figure 2, shows the login-In page for Cognitive edge framework Insurance. This is the first page that will appear to the user as the user starts the session. The user has to enter the username and Password credentials to sign in. If the user forgets he can also avail the forgot password option that is available.

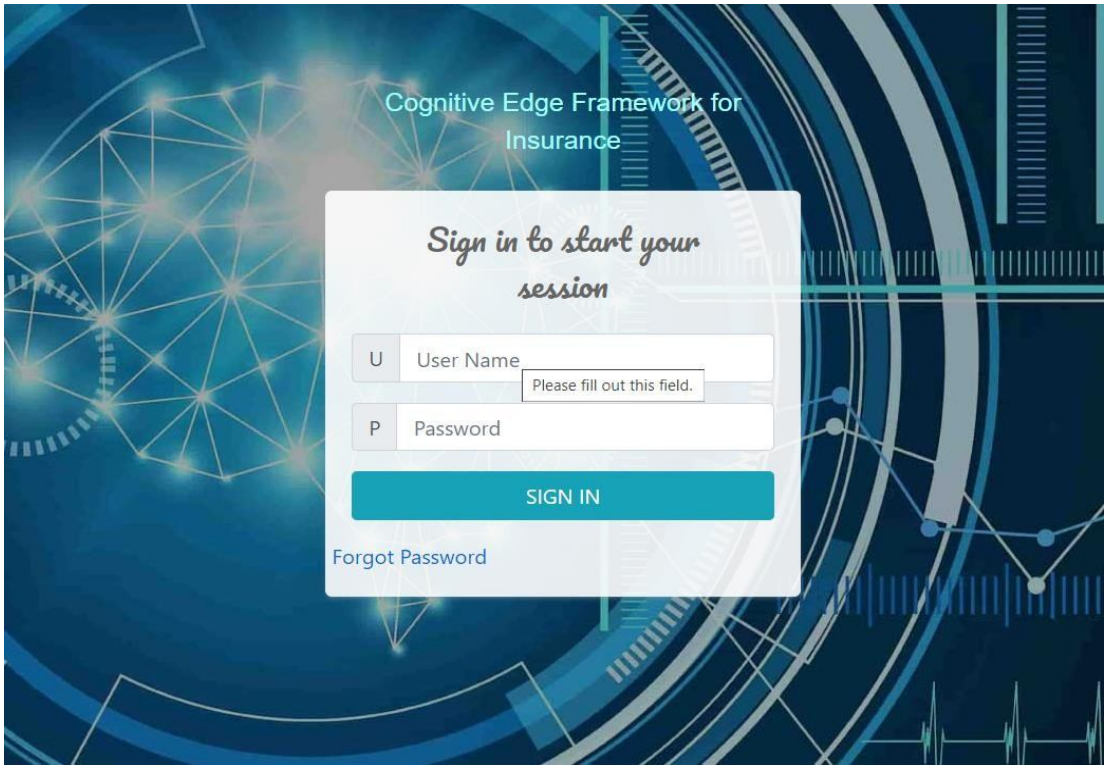


FIGURE 2: LOGIN PAGE

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*B. Customer Details*

The Figure 3 provides the customer details and this needs to be filled by the respective customers who is signing in the application. The details to be filled are Customer Name, Address, city, state, contact info, email id and Aadhar No. After entering all the details their customer can either wish to create an account or cancel it.

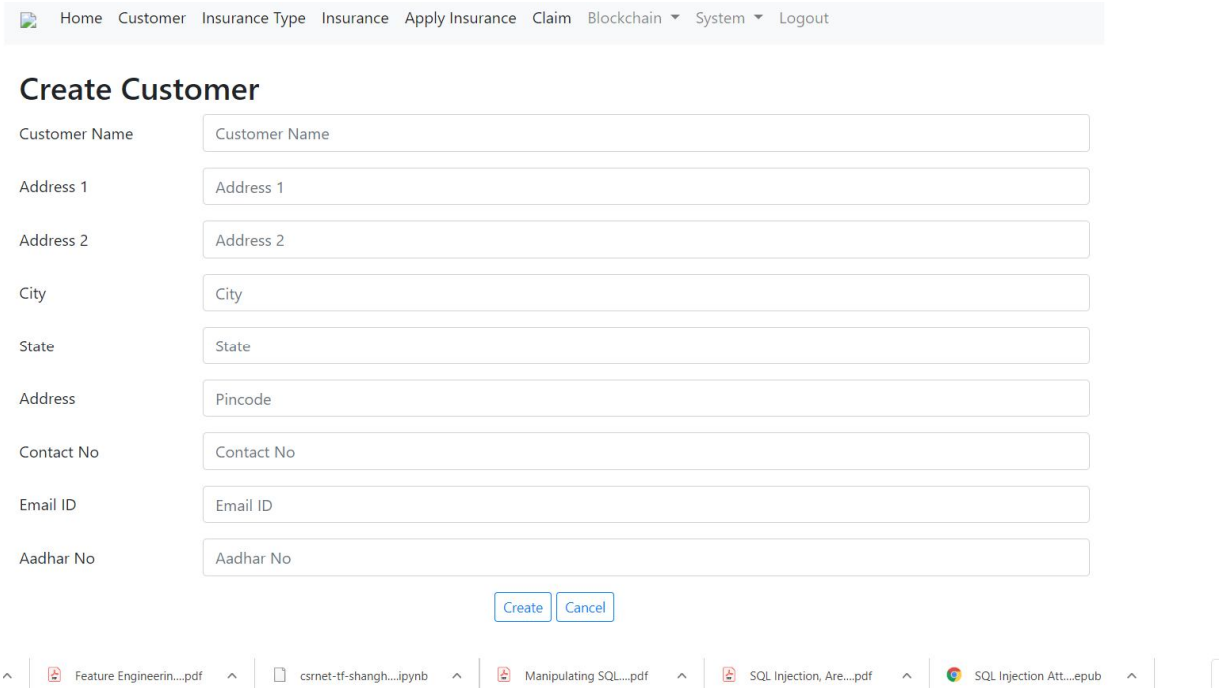


Figure 3: Entering Customer Details

*C. Report of The Customer*

Figure 4 shows the overall blockchain report for cognitive edge framework insurance. This shows all the details of the customer and also has features such as uploading, data visualization and so on. They also provide smart contract display.

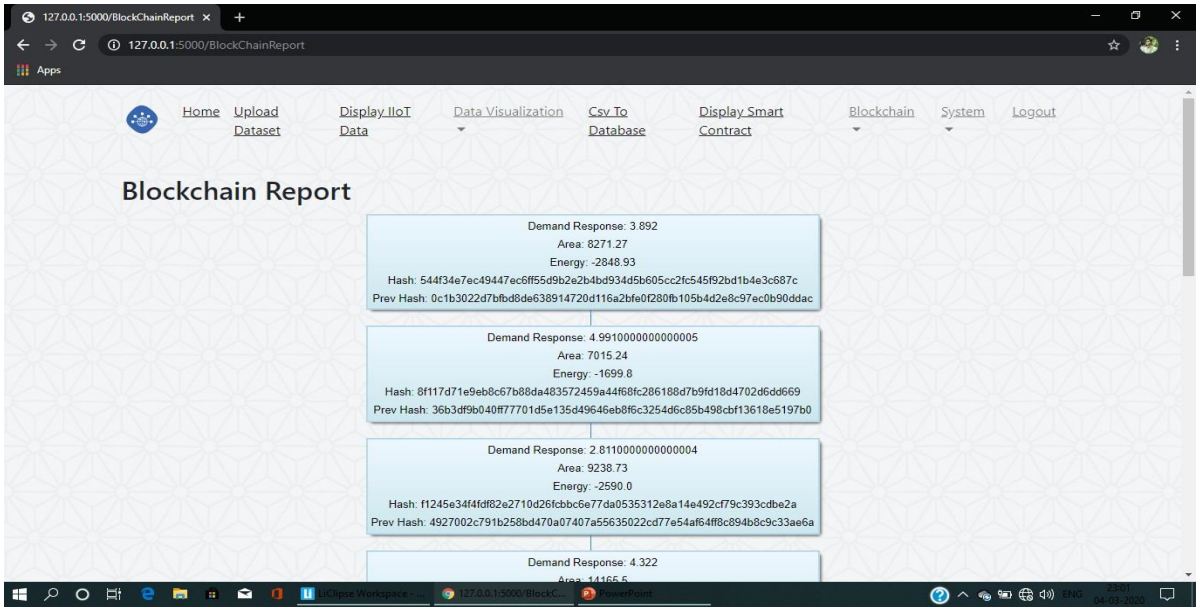


FIGURE 4: BLOCKCHAIN REPORT OF THE CUSTOMERS

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*D. Comparison of Area And Session*

Figure 5 shows the area vs session comparison of the generated blockchain. This is the visualization that are provided to the customer for easier understanding of the data that is being generated as the result of output. Data visualization helps the customer and third party to grasp and understand in a more convenient way.

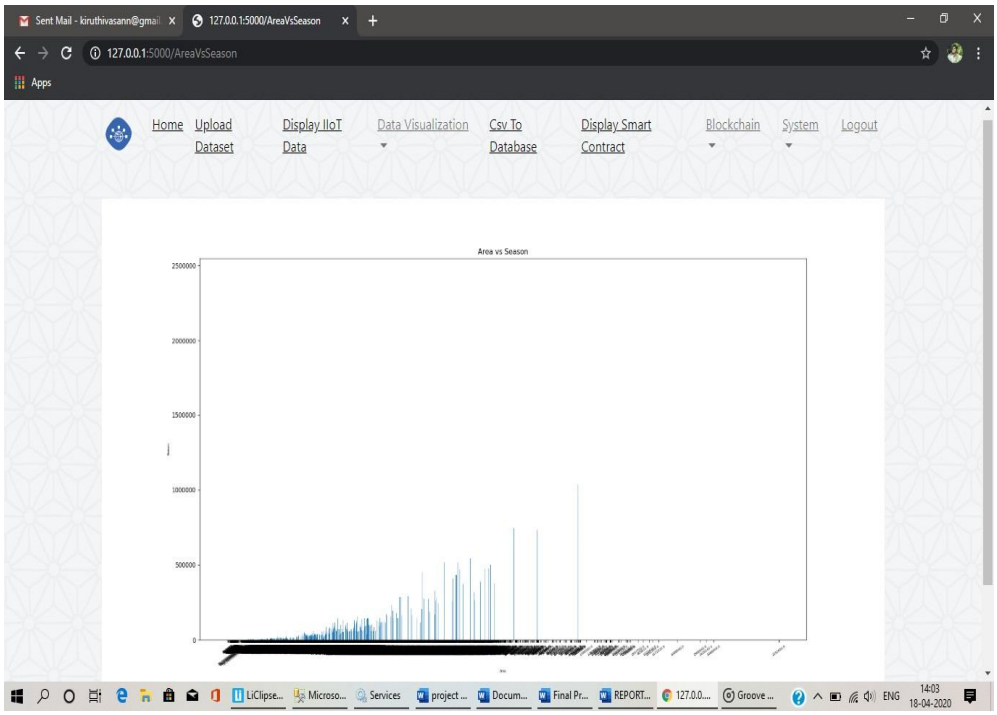


Figure 5: Area Vs Session Comparison

*E. Block Chain Generation*

Figure 6 shows the blockchain generation for cognitive edge framework insurance. They contain the most important information related to blockchain. They contain No. of blocks that are already present under the block chain and the No. of blocks that needs to be created under the block chain. According to the need new blockchains are being created.

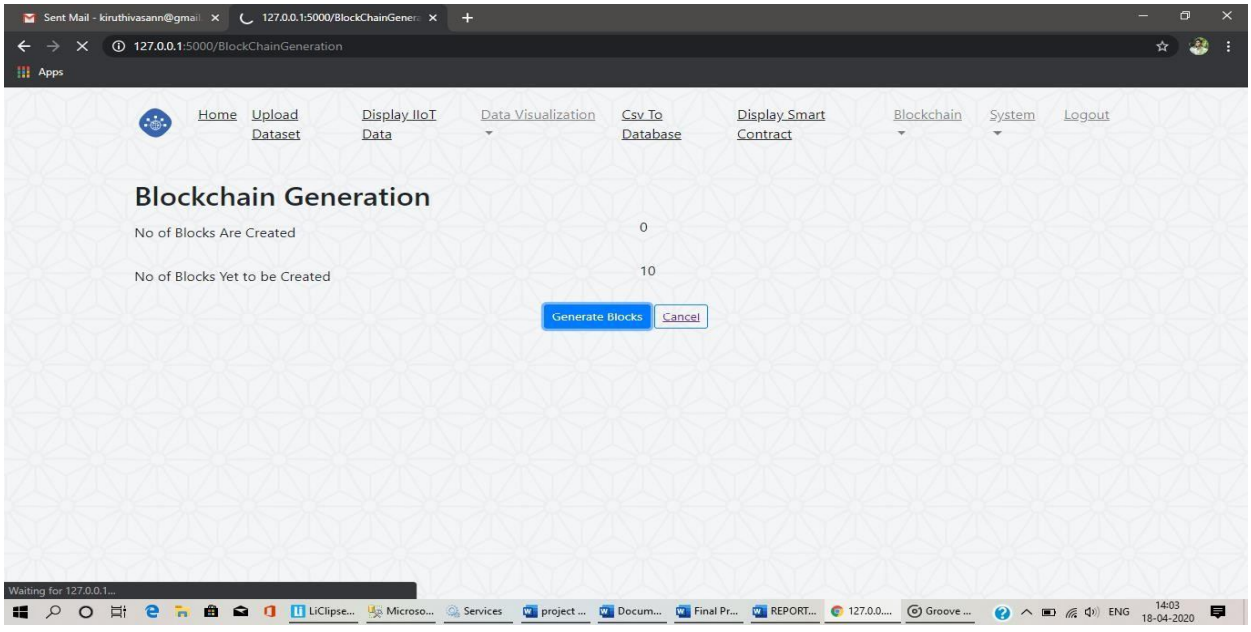


Figure 6: Generation of Blockchain

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## IV. CONCLUSION

Diverse payment system innovations are being developed by a mess of operators. Domestic wholesale payment innovations are primarily driven by a desire to extend predictability and security, whereas domestic retail payments demand improved user experience and price efficiency. Innovations for cross-border payments aim to enhance the efficiency, transparency, and traceability of payments. Regulations and requirements may need a powerful impact on the technological evolution of the payments market. Wholesale payment systems typically face stringent security requirements and regulatory uncertainty regarding new technologies.

Only by enhancing the consciousness of the bottom technology of the block chain, establishing some relevant rules and regulations, combining the block chain infrastructure with the depth of law, and combining with the Internet artificial intelligence, can the block chain technology develop healthily in the accounting industry, promote the security of financial information cannot be tampered with. With the maturity and development of block chain technology, the related problems which restrict its application in the field of accounting and finance will be solved. I believe that block chain technology will be further developed in the field of accounting and finance.

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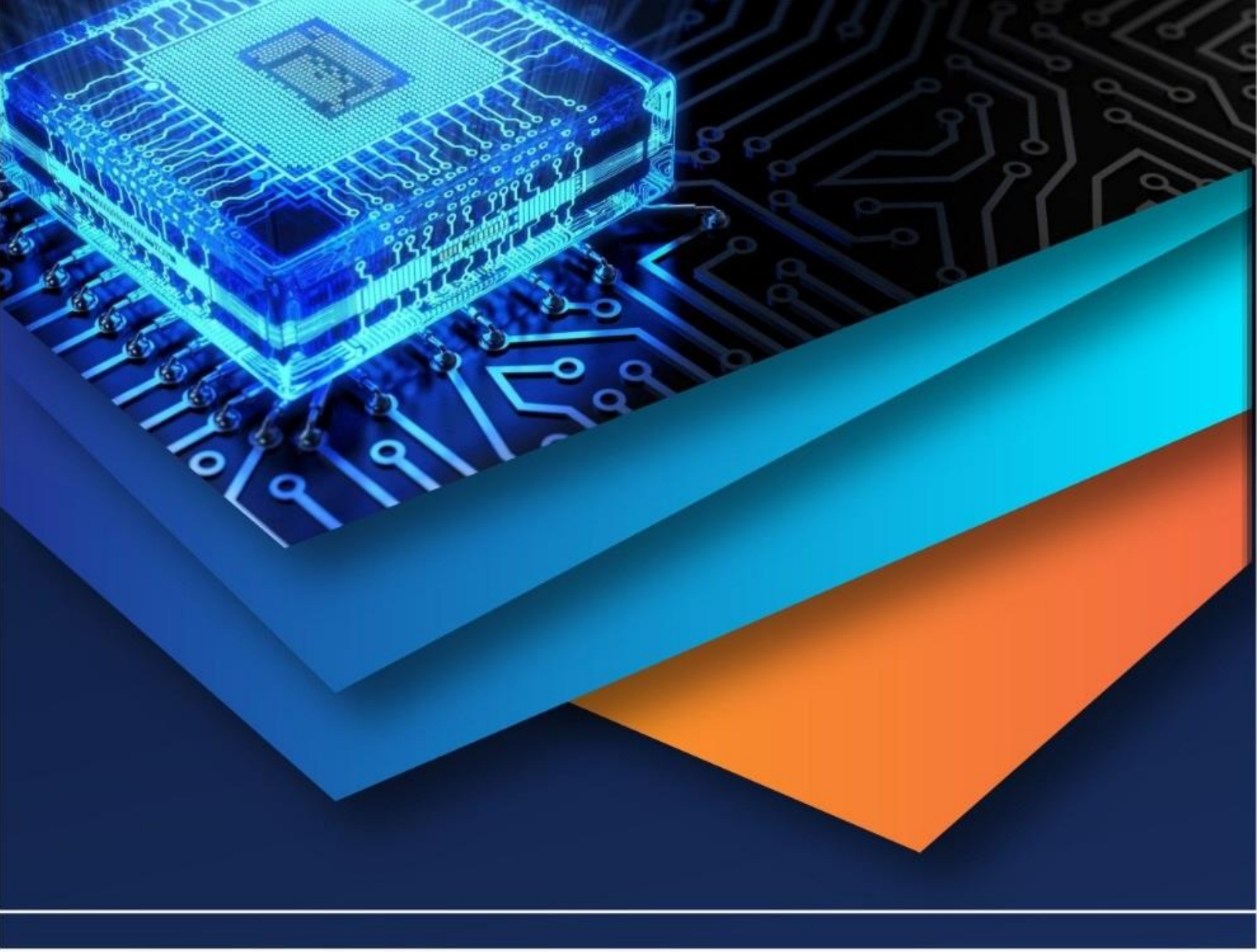

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