Online Secured Land Registration Using BlockChain

N. Jaya Santhi [1], G. Durga Bhavani [2], K. Srividhya[3], Ch. Likhitha[4]

M. Tech, Computer Science & Engineering, Bapatla Women's Engineering College, Bapatla, India[1]

B. Tech, Computer Science & Engineering, Bapatla Women's Engineering College, Bapatla, India[2-4]

Abstract: We offer a framework that the land registration industry might utilize to apply blockchain technology to Land Records. Our suggested framework aims to do two things: first, it will provide secure electronic record storage by setting chain access restrictions for the land users inside it; and second, it will apply blockchain technology for land records. Furthermore, through the utilization of chain storage for records, this initiative addresses the scalability issue that blockchain technology generally faces. A scalable, secure, and essential blockchain-based solution is being offered to the Land Records system through this initiative.

Keywords: BlockChain; PoW; Hash: Merkle Tree, SHA-256

I. INTRODUCTION

Blockchain is an innovative way of storing data about transactions and quite different from databases. The Blockchain technology was first presented by Satoshi Nakamoto in 2008 and later he implemented the technology in 2009 as a core component of bitcoin (a popular crypto currency).

The blockchain is a distributed ledger that records transactions in chronological order [3]. The ledger is maintained by every participating node in a blockchain network unlike centralized ledger where ledger is maintained on a server and all nodes update transactions on that server as shown in figure 1.2.
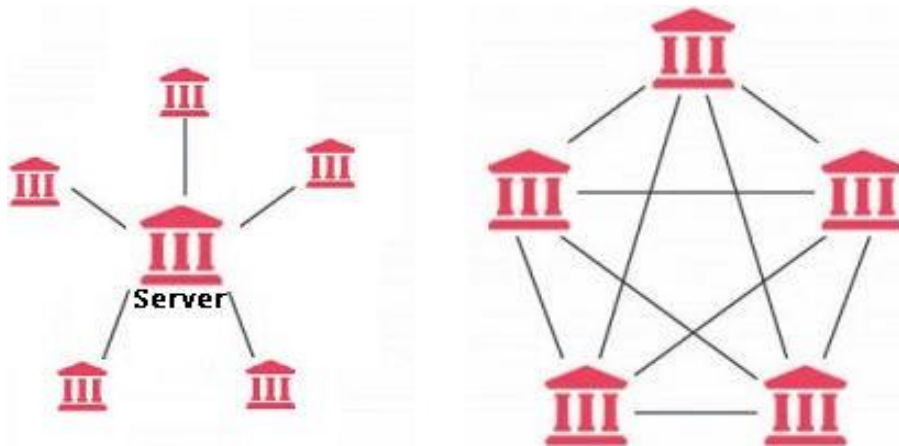

Fig 1.2: Centralized Ledger and Distributed Ledger

II. BACKGROUND & RELATED WORKS

One of the most important procedures in the transfer of property ownership from one person to another is land registration. This procedure uses a series of records called the Record of Rights (RoR), which is used in many nations, including India. It shows how ownership has changed hands throughout time and is proof of this. Unfortunately, there are a number of drawbacks to this approach, including the inability to confirm land ownership, the possibility of property fraud, and the challenge of monitoring multiple land sales. There is increasing interest in applying blockchain technology to online safe land registration as a solution to these issues. Blockchain is a digital ledger that may be used to record and verify transactions. It is transparent, secure, and decentralized.

It is possible to guarantee that land records data is impervious to manipulation and that departments may depend on each other's integrity to start transactions by putting the data in a blockchain. Apart from these advantages, smart contracts in blockchain technology can also be utilized to automate specific procedures. For instance, the approval of a bank loan can update the landowner's rights and liabilities, and the registration of land can instantly start the process of requesting a mutation in the property record. When a farmer is only eligible for a certain form of subsidy, smart contracts can also make it easier to pay them.

III. LITERATURE SURVEY

Blockchain-based land registry system: A solution to resolve the problems of land registration in Pakistan" by Muhammad Amir, Muhammad Sajid Anwar, and Muhammad Imran.

In this research article, the authors proposed a blockchain-based land registry system to address the issues in the traditional land registry system in Pakistan. They used the proof of work (PoW) algorithm and elliptic curve cryptography to ensure the system's security and confidentiality.

"A Blockchain-Based Land Registration System: A Case Study in Hangzhou, China" by Xiangyu Zhang, Xiangyu Kong, Shuangshuang Wei, and Yuanming Lu. This paper presents a blockchain-based land registration system in Hangzhou, China. They used a consortium blockchain to ensure the system's security, and the Merkle tree structure to store the land registry data efficiently.

"A Secure Land Registration System using Blockchain Technology" by Debajyoti Mondal and Jyoti Prakash Singh. This paper proposes a secure land registration system using blockchain technology. They used smart contracts to automate the land registration process, and the proof of stake (PoS) algorithm to ensure the system's security.

These are some examples of the literature that discuss the implementation of secure land registration systems using blockchain technology. I hope you find this information helpful. Let me know if you have any other questions.

IV. METHODOLOGY

The following is the mechanism used in the proposed blockchain-based secured land registration system:

Unchangeable Documentation: Every land-related transaction is documented on a blockchain, generating an impenetrable and unchangeable history of ownership. By doing this, the chance of fraudulent activity like selling the same property more than once or registering documents twice is eliminated.

Digital Certification: The blockchain stores the certificates that the Revenue Department issues, like the Record of Rights (RTC). Other organizations, such as banks, may utilize these digital certificates for verification purposes in connection with any land-related transaction.

Verification with Blockchain Data: When a sale, loan, mortgage, or other type of transaction is initiated, the information is checked using blockchain data. This guarantees that the owner of the land piece is, in fact, the potential vendor.

Smart Contracts: Using smart contracts can automate a number of tasks, including updating crop details, approving loans, and registering land. In the event of a crop failure, these contracts may also make it easier for farmers to get subsidies.

Transparency and Trust: The land registration procedure is made transparent and trustworthy by utilizing blockchain technology. It expedites the process of getting loans using land as collateral by doing away with the need for middlemen and minimizing paperwork.

Unique Record of Ownership: All parties participating in a land-related transaction will be able to access and verify the existence of a unique record, also known as a golden record of ownership, thanks to the proposed system.

Data Security: By preventing any unauthorized alteration or manipulation, blockchain technology guarantees the security and integrity of data. Ensuring the precision and dependability of land records is crucial.
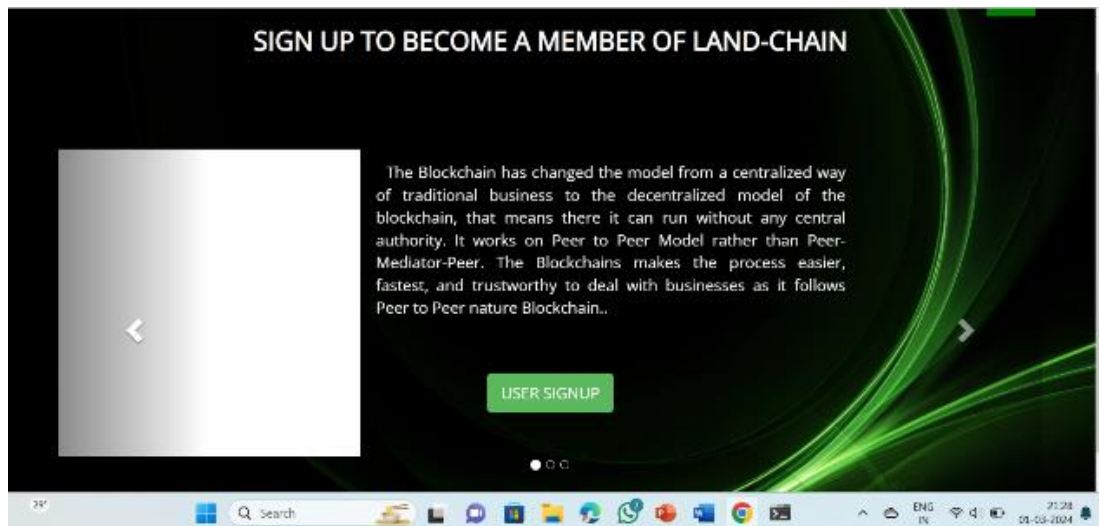
Results:

USER SIGN UP:

USER SIGN UP FORM:

BLOCK OF USER:

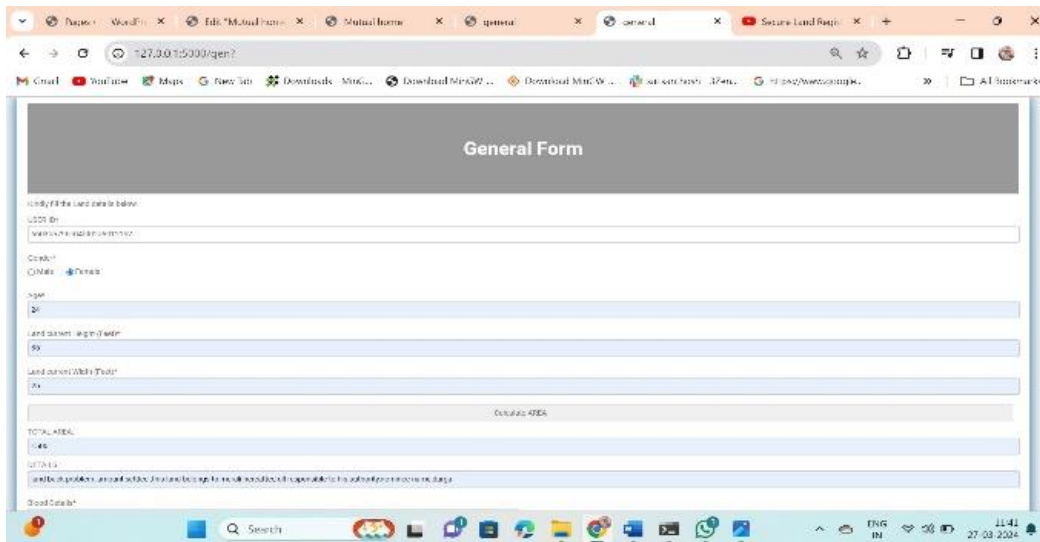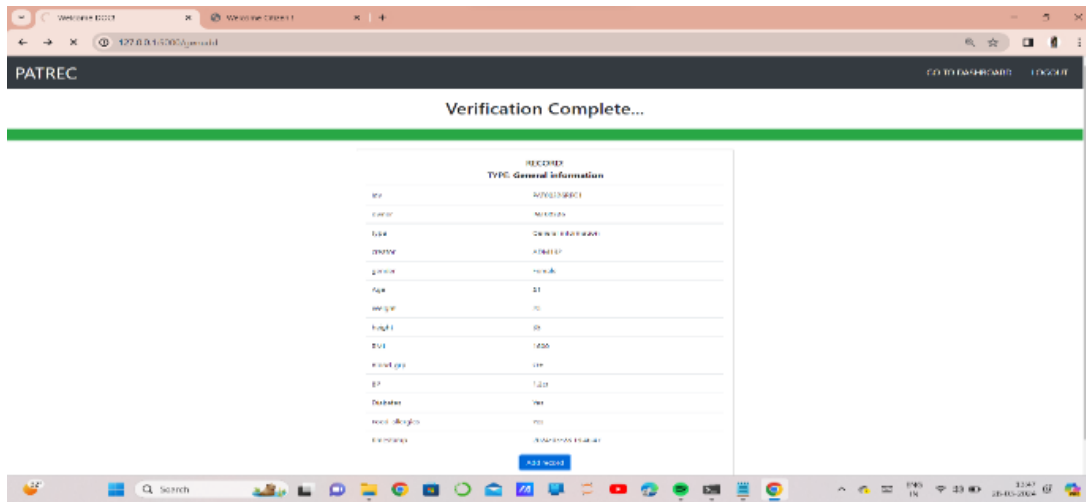**USER DASHBOARD:**

ADMIN SIGN UP:
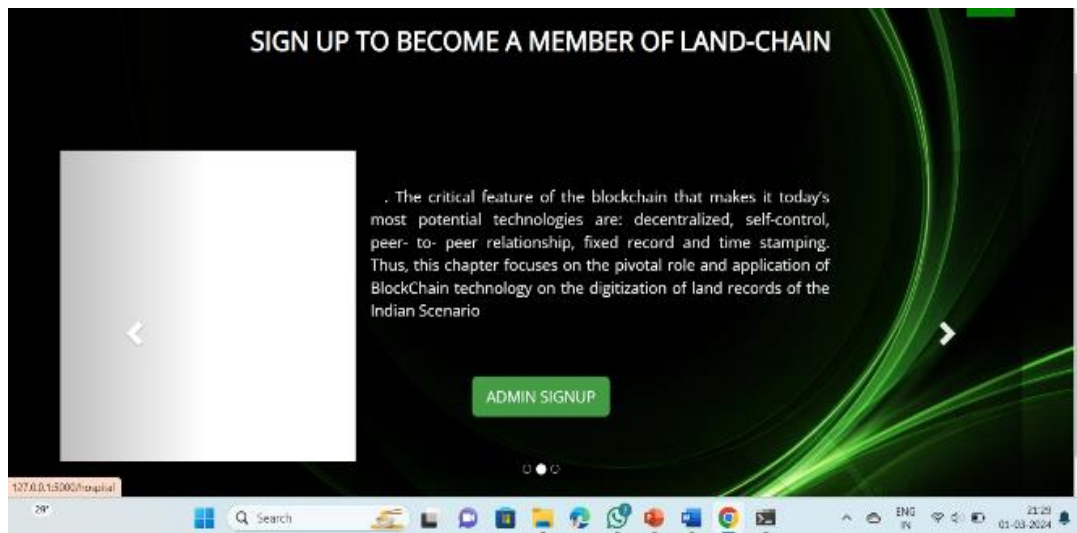
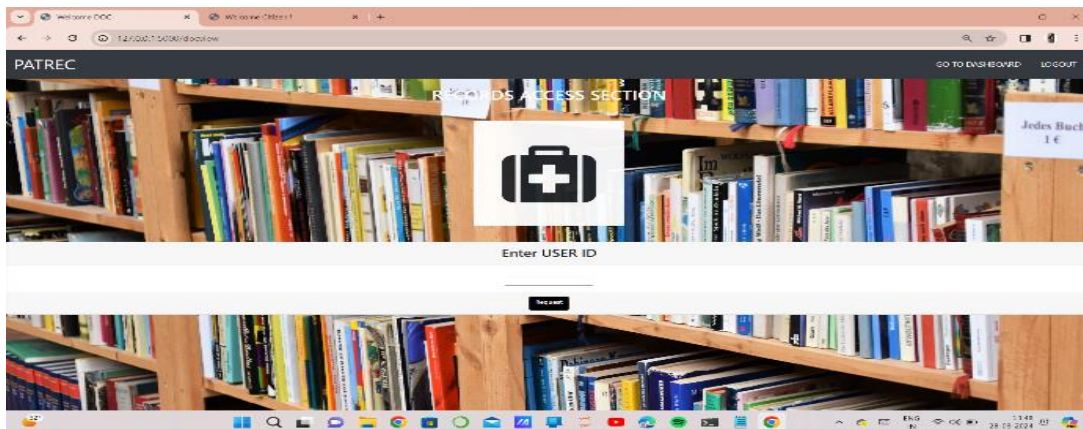**ADMIN SIGNUP FORM:**

ADMIN DASHBOARD:
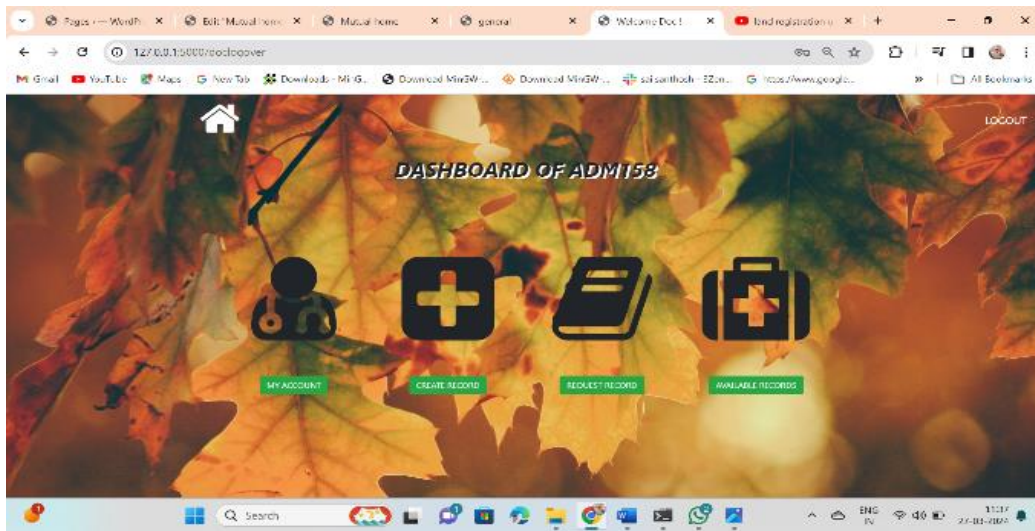
RECORD CREATION:

ADDING RECORDS:
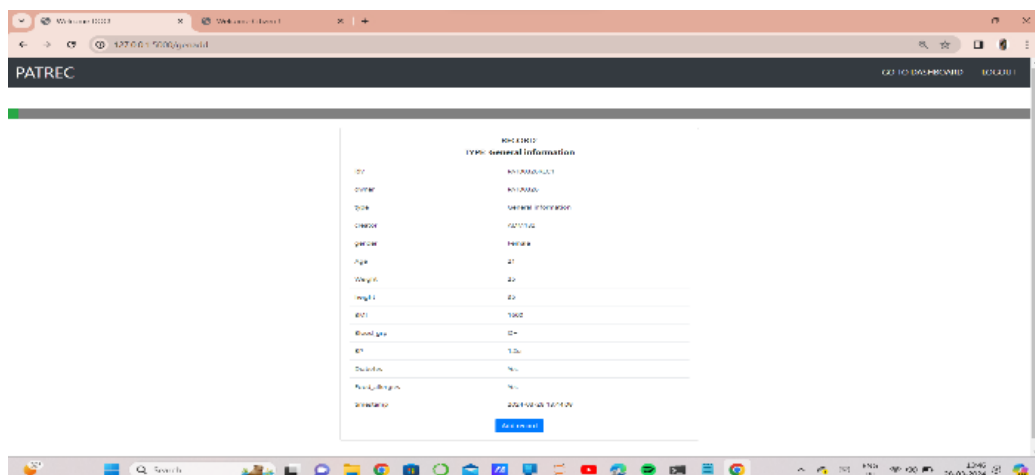
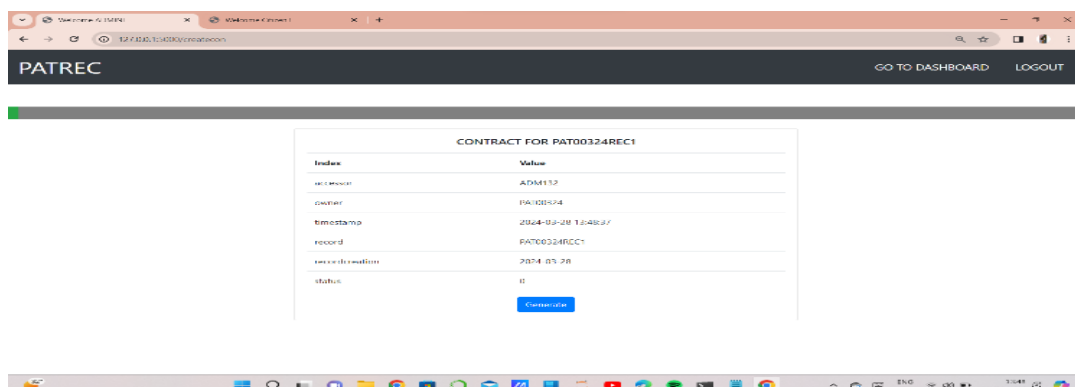## VERIFICATION OF RECORD:

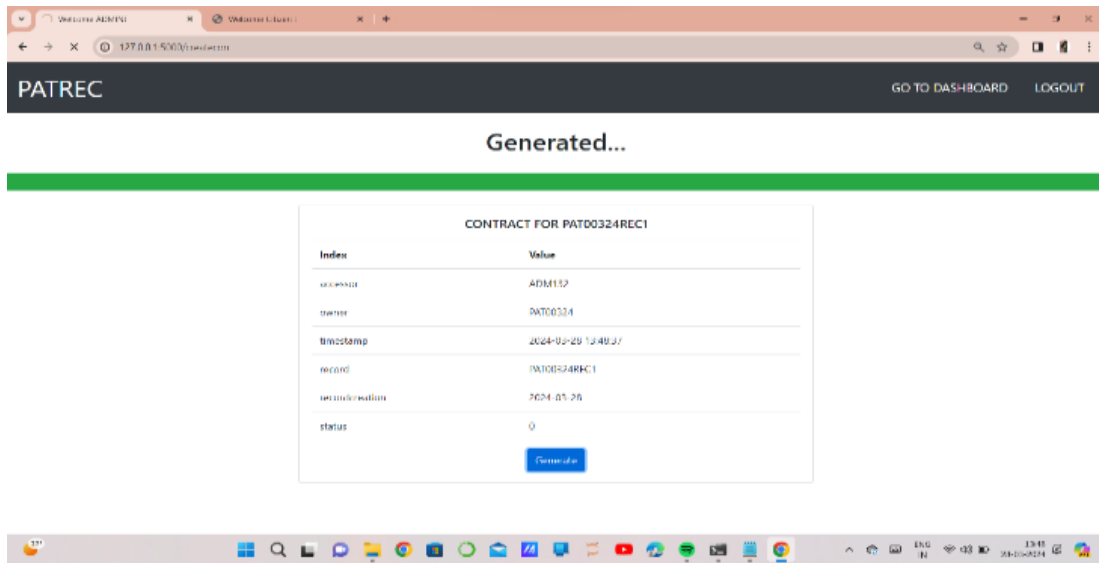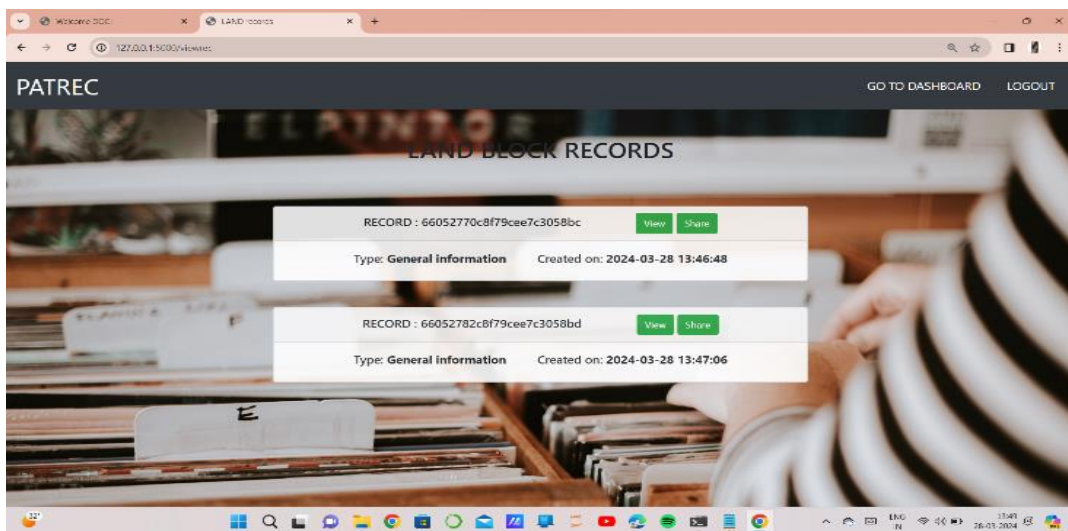## USER REQUEST:

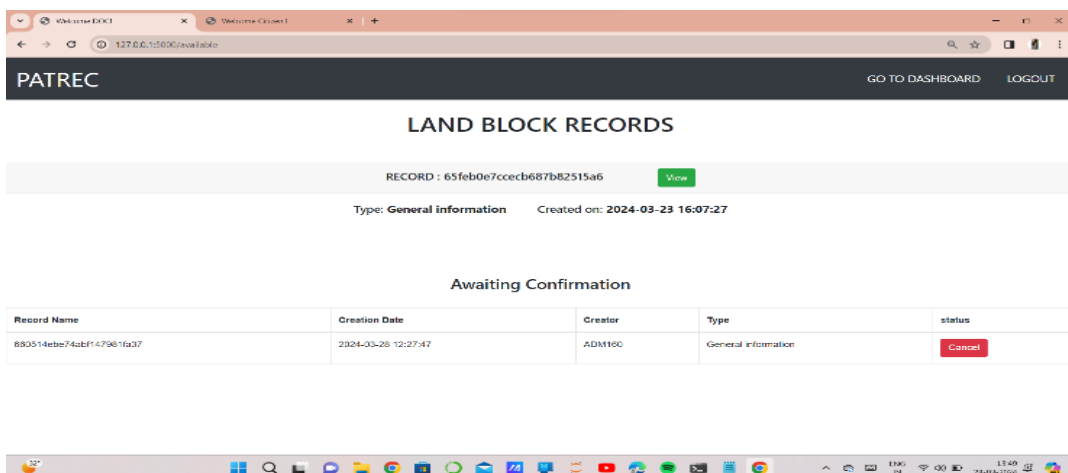## GENERATING REQUESTED RECORD:

RECORD GENERATED:

VIEW OF RECORDS:

ACCEPTENCE OF RECORDS :

V.   CONCLUSION

This work dealt with the basic smart contract creation and deployment of the Land Registration process. All the functionalities thought necessary in the land registration process have been implemented and tested on the Python. There is a significant scope to develop this project further by designing a suitable web application and integrating it with the smart contract and Ethereum Meta Mask application to make it more user friendly and easy to use. The Land Registration process can be further enhanced by automating the Land Verification Process and Land Updating Process.

VI.   FUTURE SCOPE

There are several areas where the use of blockchain technology in land registration could be further explored. One potential area is the development of smart contracts, which could automate various processes and transactions within the land registration system. Another area is the integration of other technologies, such as the Internet of Things (IoT), to enhance the accuracy and reliability of land records. Additionally, there is potential for the use of blockchain technology in land registration to expand to other regions and countries, particularly in those where land registration systems are currently vulnerable to fraud and corruption.

REFERENCES

[1] P. Deng and Y. Ouyang, "Research on the method of improving community governance capability based on block-chain technology," 2021 IEEE International Conference on Consumer Electronics and Computer Engineering (ICCECE), 2021, pp. 706- 709, doi: 10.1109/ICCECE51280.2021.9342128.[3] E. Luo, M. Z. A. Bhuiyan, G. Wang, M. A. Rahman, J. Wu, and M. Atiquzzaman, "Privacyprotector: Privacy-protected patient data collection in iot-based healthcare systems," IEEE Communications Magazine, vol. 56, no. 2, pp. 163–168, Feb 2018.

[2] Christo, Mary Subaja and Sarathy, Partha and Priyanka, C and Kumari, Raj and others. (2019) "An Efficient Data Security in Medical Report using Block Chain Technology." 2019 International Conference on Communication and Signal Processing (ICCSP). IEEE, 2017. 0606-0610.

[3] Nakamoto, Satoshi and others. (2008) "Bitcoin: A peer-to-peer electronic cash system." Citeseer.

[4] Norta, Alex, Chad Fernandez, and Stefan Hickmott. (2018) "On Blockchain Application: Hyperledger Fabric and Ethereum." Commercial Property Tokenizing With Smart Contracts." 2018 International Joint Conference on Neural Networks (IJCNN). IEEE, 2018.

[5] Turkanovic Muhamed, Marko Hölbl, Kristjan Košič, Marjan Heričko, Aida Kamišalić EduCTX: A blockchain-based higher education credit platform. IEEE access, 6 (2019), pp. 5112-5127

[6] Sajana P, M. Sindhu, M Sethumadhavan On Blockchain Application: Hyperledger Fabric and Ethereum. International Journal of Pure and Applied Mathematics, 118 (18) (2018), pp. 2965-2970

[7] Sankar, Lakshmi Siva, M. Sindhu, and M. Sethumadhavan. (2017) "Survey of consensus protocols on blockchain applications." 4th International Conference on Advanced Computing and Communication Systems (ICACCS). IEEE, 2017.

[8] Greeshma Sarath and S.H, M. Lal, "Privacy Preservation and Content Protection in Location Based Queries", in Proceedings of the 2015 Eighth International Conference on Contemporary Computing (IC3), Washington, DC, USA, 2015

[9] B. Venugopal and Greeshma Sarath, "A Novel Approach for Preserving Numerical Ordering in Encrypted Data", in 2016 International Conference on Information Technology (ICIT), Bhubaneswar, India, 2016.

[10] A. Bogner, M. Chanson, and A. Meeuw, "A decentralised sharing app running a smart contract on the Ethereum blockchain," in Proc. 6th Int. Conf. Internet Things, 2016, pp. 177–178.

[11] K. Salah, M. Rehman, N. Nizamuddin, and A. Al-Fuqaha, "Blockchain for AI: Review and open research challenges," IEEE Access, vol. 7, pp. 10127–10149, 2019.

[12] H. Hasan and K. Salah, "Combating deepfake videos using blockchain and smart contracts," IEEE Access, vol. 7, no. 1, pp. 41596–41606, Dec. 2019.

[13] R. Beck, J. S. Czepluch, N. Lollike, and S. Malone, "Blockchain-the gateway to trust-free cryptographic transactions," in Proc. ECIS, May 2016, p. 153.

[14] N. Nizamuddin, H. Hasan, and K. Salah, "IPFS-blockchain-based authenticity of online publications," in Proc. Int. Conf. Blockchain (ICBC) (Lecture Notes in Computer Science). Seattle, WA, USA: Springer, 2018.

[15] H. Hasan and K. Salah, "Blockchain-based proof of delivery of physical assets with single and multiple transporters," IEEE Access, vol. 6, no. 1, pp. 46781–46793, Dec. 2018

BIBLIOGRAPHY

Mrs. N. Jaya Santhi working as Assistant Professor in Department of CSE, Bapatla Women's Engineering College, Bapatla. She completed her B. Tech in Computer Science Engineering from SRKR College of Engineering, Bhimavaram, and completed her M. Tech in Information Technology from Priyadarshini College of Engineering, Tenali. She has one years of teaching experience in Engineering College.

G. Durga Bhavani B. Tech with Specialization of Computer Science Engineering in Bapatla Women's Engineering college, Bapatla

K. Srividhya B. Tech with Specialization of Computer Science Engineering in Bapatla Women's Engineering college, Bapatla

Ch. Likhitha B. Tech with Specialization of Computer Science Engineering in Bapatla Women's Engineering college, Bapatla