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Travel Document Management System Using Blockchain

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ABSTRACT: Merely possessing the skill of driving does not guarantee a hassle-free experience on the road. Presenting a plethora of documents, including a driver's license, pollution certificate, and car papers, to traffic authorities when asked, can be a tedious and troublesome task. Misplacement or damage of these papers is also a possibility, and their credibility is often questionable. Given these shortcomings, it is imperative to explore a system that simplifies the process of carrying and verifying these documents, ensuring transparency and authenticity. Furthermore, the time it takes to inspect a vehicle owner's paperwork can stretch up to 15 minutes, leading to traffic congestion and reduced efficiency. Hence, it is crucial to address this issue and devise an effective solution.

KEYWORDS: Travel Document Management, Blockchain, Hashing, Document Verification

I. INTRODUCTION

Blockchain is a secure, unalterable ledger that simplifies the process of recording transactions and monitoring assets in a business network. Assets can be tangible, like real estate, cars, cash, and land, or intangible, such as patents, intellectual property, branding, and copyrights. Essentially, anything valuable can be tracked and exchanged on a blockchain network, minimizing risk and reducing costs for all parties involved. Blockchain is particularly advantageous for providing immediate, transparent, and shared data stored on an immutable ledger that is only accessible to authorized network participants.

A blockchain network can monitor a wide range of activities such as orders, payments, accounts, production, and more. And since members share a single, comprehensive view of the truth, every aspect of a transaction can be observed from beginning to end, providing greater confidence, as well as novel efficiencies and opportunities. All network participants can access the distributed ledger and its unalterable record of transactions.

As a result of the shared ledger, transactions are only recorded once, removing the need for the redundant effort that characterizes conventional business networks. No participant can modify or tamper with a transaction once it has been recorded on the shared ledger. In the event of an error in a transaction record, a new transaction must be added to reverse the error, and both transactions become visible.

II. LITERATURE SURVEY

The authors propose the use of blockchain technology to create a tamper-proof, secure, and transparent authentication system. The system involves the creation of a digital signature for each document using a private key, which is then stored on the blockchain network. The signature can be verified using a public key, ensuring the authenticity of the document. The authors also introduce a novel concept of "Doc-Block," which is a blockchain-based decentralized application (DApp) that serves as a platform for the authentication and verification of digital documents. The system allows for easy sharing of documents and real-time verification of their authenticity. The paper also presents a case study that demonstrates the effectiveness of the proposed system in the context of academic certificates.

The proposed system involves assigning a unique QR code to each product, which contains all relevant information about the product, including its source, date of manufacture, and expiration date. The QR code is scanned and verified using OpenCV technology, and the information is stored on a blockchain network. This creates a tamper-proof and transparent record of the product's journey from the manufacturer to the end consumer. The authors also introduce a concept of smart contracts, which automate the inventory management process and ensure compliance with regulations and standards. The system allows for easy tracking and monitoring of inventory, reducing the risk of fraud and counterfeiting.

The authors propose the use of blockchain technology to create a tamper-proof, secure, and transparent authentication system for educational documents. The system involves creating a digital signature for each document using a private key, which is then stored on a blockchain network. The signature can be verified using a public key, ensuring the authenticity of the document. The authors also introduce the concept of "EduBlock," which is a blockchain-based platform that serves as a secure and transparent repository for educational documents. The system allows for easy sharing of documents and real-time verification of their authenticity. The platform also enables educational institutions to issue digital certificates to students, which can be easily verified by employers and other institutions.

III. SYSTEM ARCHITECTURE

In the proposed system we have used a decentralized database using blockchain where data can be stored efficiently while reducing down time and resolving other issues such as no more need of carrying physical documents or storing unverified documents while traveling which might cause traffic issues. These all were used to gain better results.
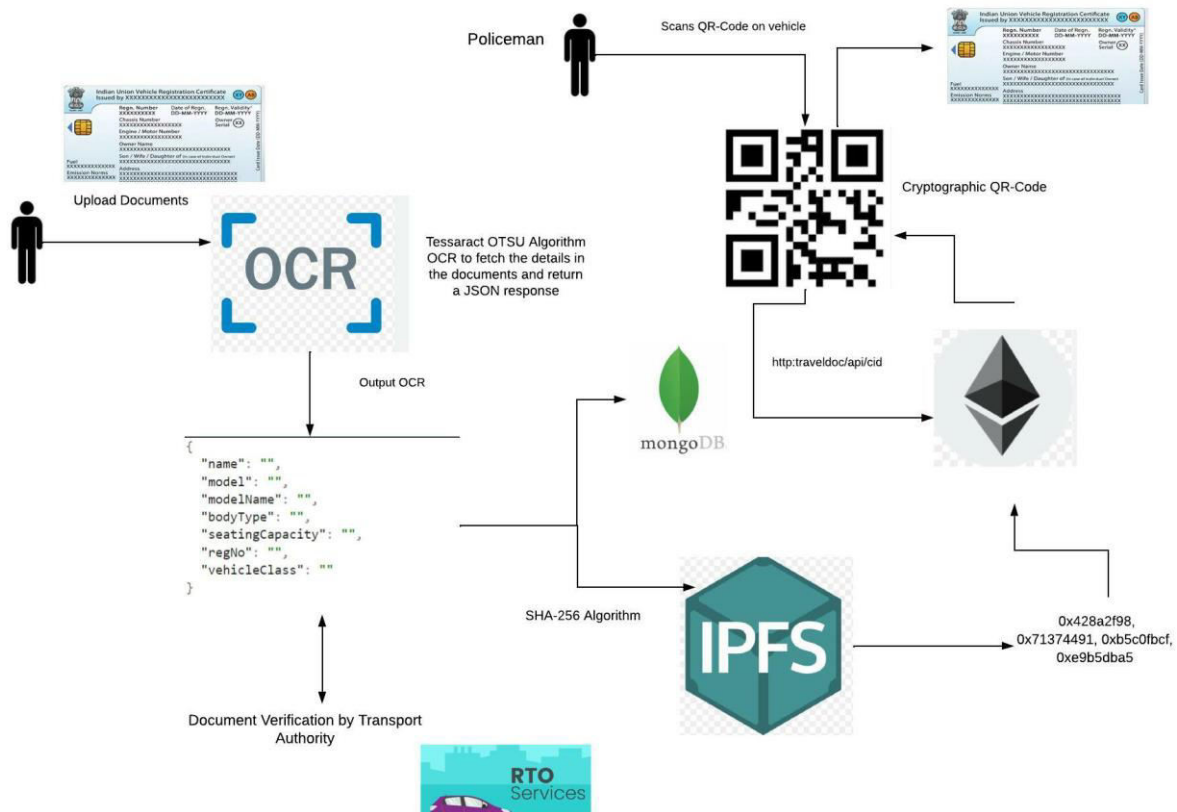

Fig 1: System Architecture

Before logging into the system, the user must complete the KYC Process, after the user has been validated, he or she is

permitted to log into the portal. Following that, the user can submit numerous vehicle-related paperwork. The papers will be uploaded to the IPFS network, which is a decentralized peer-to-peer network that generates a unique hash for each document. To ensure that no one tampers with the documents, the hash of those documents is recorded on the blockchain network. OCR is used to automatically fetch and verify all of the data.

The undersigned authorities will verify the documents after they have been posted. If all of the documents fulfill the requirements, the user will be given a QR code that contains all of the information about those papers as well as a unique stamp/digital signature assuring the user that the QR code is valid and ready to use anywhere. If the documents are missing information, the authorities will reject them, and the user will have to resubmit them, satisfying all of the requirements.

IV. RESULT AND ANALYSIS

Certain procedures may hinder the efficiency of the algorithm, without impacting its accuracy or precision. Other processes, however, may have an effect on both the efficiency and the predicted result. To conduct a thorough evaluation of our algorithm, we have organized the assessment based on the primary processes and analyzed the impact of each procedure on the algorithm's performance. Our evaluation was conducted on a machine equipped with an i5 processor running at 2.2 GHz and 8 GB of RAM.

The system we have used a decentralized database using blockchain where data can be stored efficiently while reducing down time and resolving other issues such as no more need of carrying physical documents or storing unverified documents while traveling which might cause traffic issues. These all were used to gain better results.
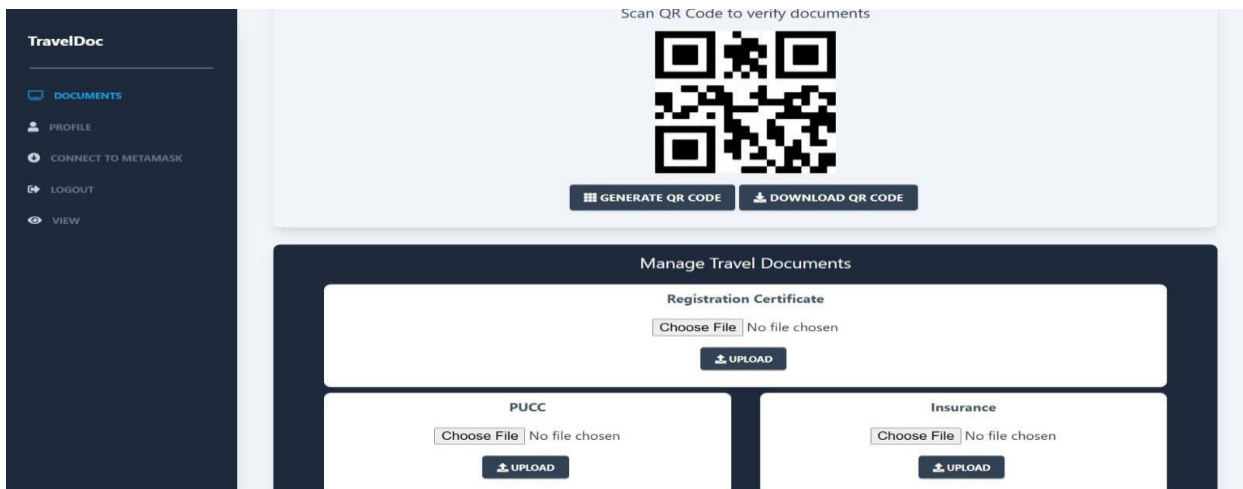

Fig 2: Dashboard

Figure 2 shows the dashboard of our project where the user has to upload all the travel related documents and after uploading them can download the qr code from which documents can be retrieved.
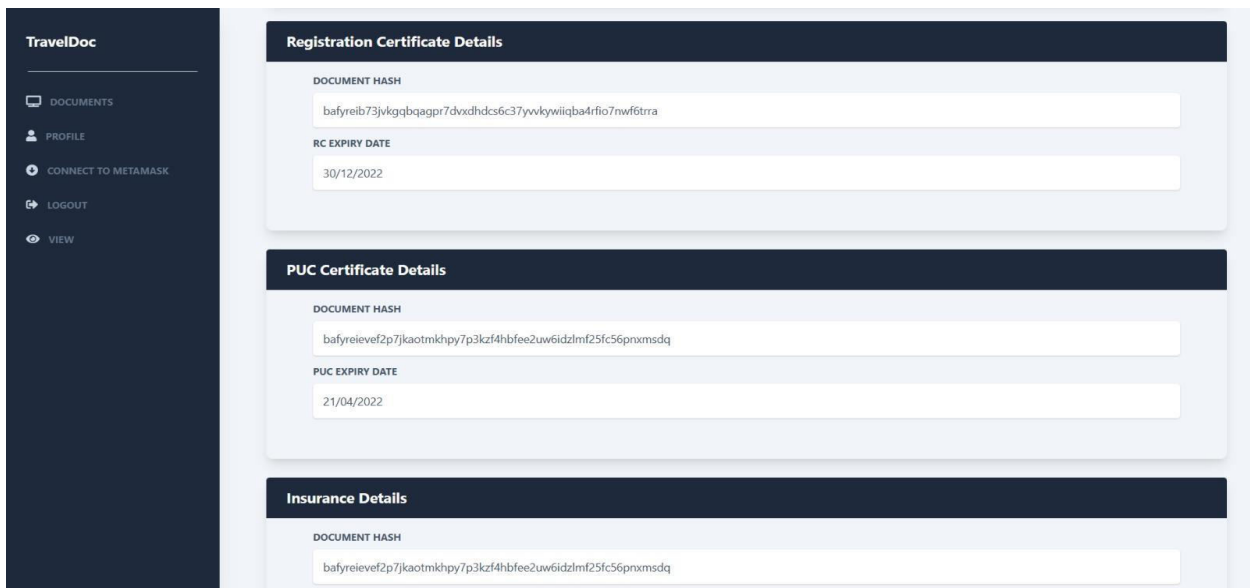
Fig 3: View Page

Figure 3 shows the view page of our project where users can verify all the documents stored in the system and their respective hash values which are stored on the blockchain.
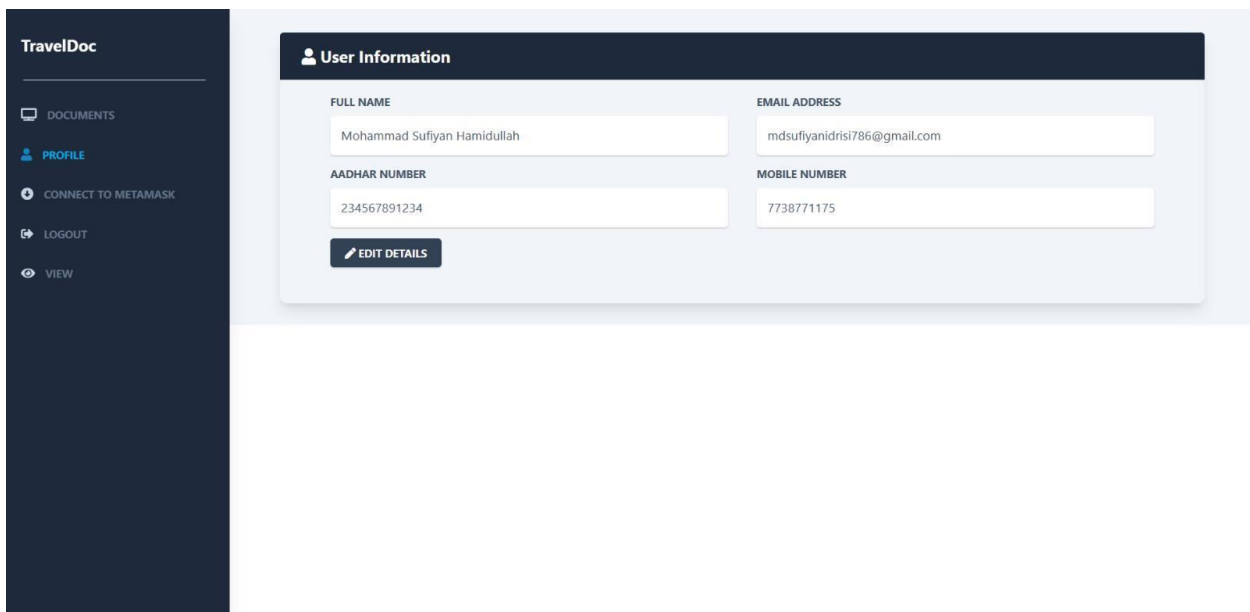

Fig 4: User Details Page

Figure 4 shows the User details page of the project where users can verify their KYC details which are uploaded in the system.

V. CONCLUSION

The management of information and documentation is crucial for the success of any project or business. Document Management is a necessary process that helps to organize and manage the information related to a project. However, in the construction sector, Document Management has not evolved much despite technological advancements. Document Management System (DMS) is an efficient, time-saving, and easy way to report, view,

and control the version of a file. Various types of DMS such as Electronic Document Management System (EDMS) are currently being used in different companies or groups of companies for the management of documents. EDMS tools enable employees of the same company or partners of a construction project to exchange data and communicate. In this report, we have proposed a blockchain-based system that reduces downtime to fetch data and resolves the issue of carrying verified documents while traveling. The proposed system uses QR codes to store and access data, which can be easily scanned by authorities like traffic police. The benefits and applications of the proposed system are discussed in detail.

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