

# Insurance Claim - using Blockchain Technology

Bonthala Saranya Thatri<sup>1</sup>, Degala Saranya<sup>2</sup>, Kalavakolanu Lakshmi Sarvani<sup>3</sup>, Syed Ishrat<sup>4</sup>

<sup>1</sup> Student, CSE(IoT,Cybersecurity inc. Blockchain Technology), VVIT, Andhra Pradesh, India

<sup>2</sup> Student, CSE(IoT,Cybersecurity inc. Blockchain Technology), VVIT, Andhra Pradesh, India

<sup>3</sup> Student, CSE(IoT,Cybersecurity inc. Blockchain Technology), VVIT, Andhra Pradesh, India

<sup>4</sup> Student, CSE(IoT,Cybersecurity inc. Blockchain Technology), VVIT, Andhra Pradesh, India

## ABSTRACT

*This paper addresses the persistent issue of delays in insurance claims settlements, particularly in cases involving death or bodily injury. These delays are primarily caused by the intricate involvement of various stakeholders and the manual submission of documents, necessitating a more streamlined approach. The overarching objective is to expedite claim settlements, thereby improving customer satisfaction, safeguarding broker reputation, and sustaining the company's Net Promoter Score (NPS). To achieve these goals, the project employs innovative blockchain technology and smart contracts. By leveraging blockchain and Distributed Ledger Technology (DLT), the aim is to establish a seamless, transparent, and tamper-proof claims settlement process. A pivotal aspect of this initiative involves the creation of an immutable, industry-wide claims record. This centralized record effectively combats fraud by eliminating data fragmentation and enhancing overall transparency. Furthermore, this approach grants customers greater control over their data. Through mechanisms such as managing access rights and ensuring privacy, customers can actively participate in the claims settlement process, fostering trust and confidence in the insurance ecosystem. Overall, the project endeavors to revolutionize the traditional insurance landscape by introducing a more efficient and secure mechanism for claims processing, thereby benefiting all stakeholders involved.*

**Keyword :** - Blockchain, Ethereum, Insurance Claim, and Ethers

## 1. INTRODUCTION

The insurance industry plays a pivotal role in safeguarding individuals and businesses against unforeseen risks, providing financial protection in times of need. However, despite its critical function, the industry grapples with persistent challenges, particularly in the realm of claims settlement. Delays in processing insurance claims, especially those involving death or bodily injury, have been a longstanding issue, stemming from complex stakeholder dynamics and cumbersome manual procedures. These delays not only strain customer satisfaction but also impact broker reputation and the overall Net Promoter Score (NPS) of insurance companies. In response to these challenges, there is a pressing need for innovative solutions that can expedite claims settlements while enhancing transparency and efficiency. Blockchain technology and smart contracts have emerged as promising tools to address these issues. By leveraging the inherent features of blockchain, such as immutability, transparency, and decentralized consensus, along with the automation capabilities of smart contracts, it is possible to revolutionize the insurance claims settlement process. This research project aims to explore and implement a novel approach to mitigate delays in insurance claims settlements through the integration of blockchain technology and smart contracts. The primary objective is to establish a seamless, transparent, and tamper-proof mechanism for processing claims. Central to this initiative is the creation of an immutable, industry-wide claims record, which serves as a single source of truth, eliminating data fragmentation and enhancing trust among stakeholders. Furthermore, by empowering customers with greater control over their data and privacy, this approach seeks to enhance overall transparency and accountability in the insurance ecosystem. Through a comprehensive examination of the benefits and challenges associated with implementing blockchain-based solutions in the insurance industry, this research endeavors to contribute to the ongoing discourse on the transformation of insurance claims processing.

## 1.1 EXISTED SYSTEM

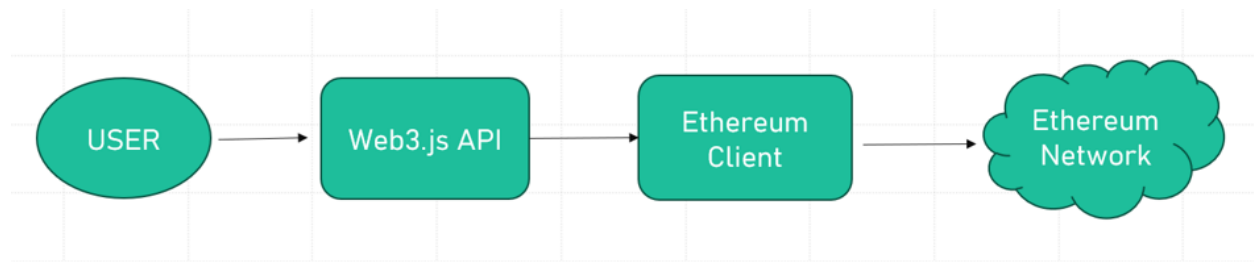
The existing process for insurance claiming involves a multi-faceted and often convoluted series of steps. When a claim arises, the policyholder typically initiates the process by notifying their insurance provider. This triggers a sequence of events that includes the submission of various documents and evidence to support the claim, such as police reports, medical records, and proof of ownership. These documents are often manually reviewed by insurance agents or adjusters, a process that can be time-consuming and prone to errors. Additionally, the involvement of multiple stakeholders, including brokers, underwriters, and legal teams, further complicates the process and may lead to delays in claim resolution. Once the documentation is assessed, negotiations may ensue between the policyholder and the insurance company regarding the settlement amount. This negotiation phase can prolong the process, particularly if there are disputes or discrepancies in the information provided. Following agreement on the settlement terms, the final step involves the disbursement of funds to the policyholder, which may require additional administrative tasks and processing time. Throughout this process, transparency and accountability can be lacking, as there is often limited visibility into the status of the claim and the decision-making process. Moreover, the potential for data fragmentation and security breaches poses risks to the integrity and confidentiality of sensitive information. In summary, the existing insurance claiming process is characterized by manual procedures, fragmented data systems, and a lack of transparency, all of which contribute to delays, inefficiencies, and customer dissatisfaction. There is a clear need for innovative solutions to streamline and enhance this process, thereby improving the overall experience for policyholders and insurers alike.

## 2. PROPOSED SYSTEM

In the quest to address the inefficiencies and complexities inherent in the insurance claims process, this research project introduces a pioneering approach leveraging blockchain technology, smart contracts, and automated surveillance systems. Central to this endeavor is the establishment of a unified platform where all stakeholders can seamlessly submit documents, thus streamlining decision-making processes and enhancing overall efficiency. The utilization of cryptographic techniques ensures heightened security, guarding against unauthorized alterations to submitted documents. Furthermore, the transparency inherent in blockchain technology facilitates traceable modifications, expediting decisions and accelerating claim settlements. This initiative extends its scope to encompass various insurance claim types, including those related to life insurance death/bodily injury and non-life claims. To bolster security measures, an automated surveillance system is integrated into the blockchain-based platform, effectively identifying and preventing instances of fraud while supporting rigorous enforcement of security policies. At its core, this project seeks to revolutionize the insurance sector by fostering transparency and trust through the strategic integration of blockchain, smart contracts, and surveillance technologies. Tailored smart contracts are employed to automate diverse claim types, thereby amplifying both security and efficiency throughout the claims process. The meticulous integration of these cutting-edge technologies holds significant potential to fundamentally reshape the landscape of insurance claims processing, promising tangible benefits for both insurers and policyholders alike.

### 2.1 OVERVIEW OF OUR PROPOSED SYSTEM

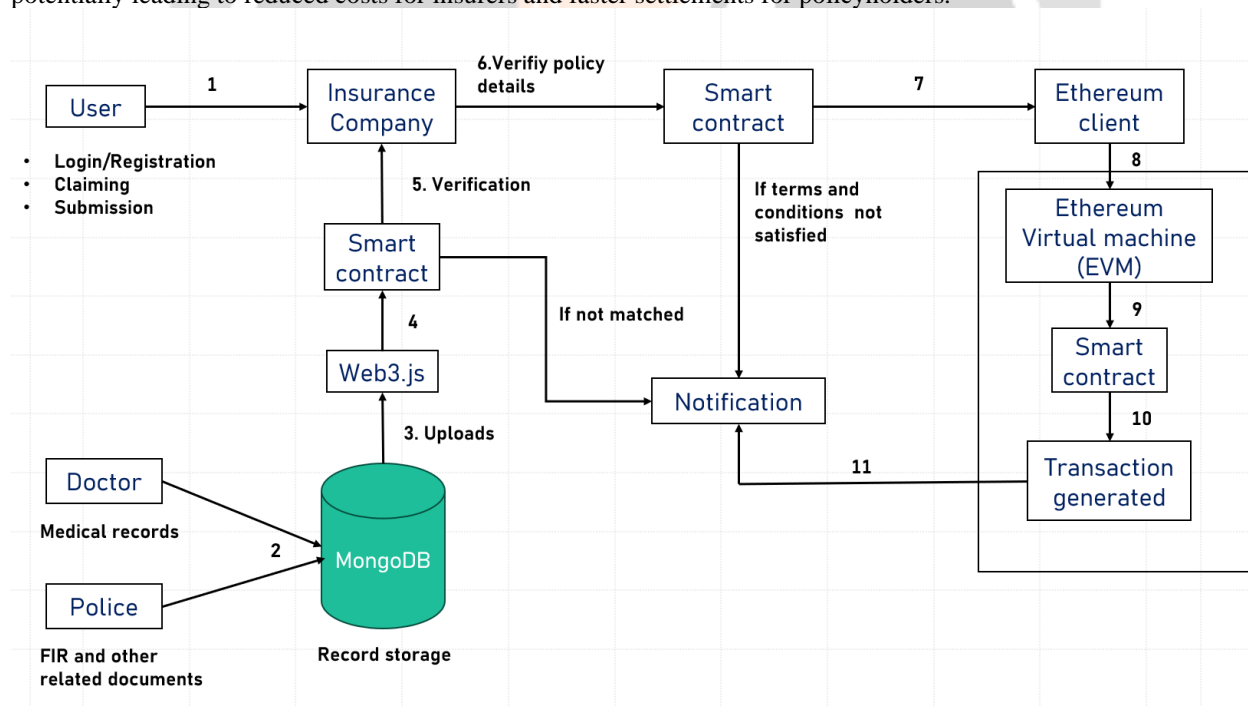
- User: This represents the application or user initiating a transaction on the Ethereum blockchain.
- Web3.js API: This represents a JavaScript library that provides a high-level interface for interacting with the Ethereum blockchain. Web3.js simplifies the process of deploying contracts, sending transactions, and working with Ethereum data.
- Ethereum Client: This refers to software that interacts directly with the Ethereum network. It connects to other blockchain nodes, processes transactions, and maintains the state of the network. There are different Ethereum clients available, some popular ones include Geth and OpenEthereum.
- Ethereum Network: This refers to the peer-to-peer network that underlies the Ethereum blockchain. It is a distributed network of computers that collectively maintain the Ethereum ledger.



**Fig -1 Overview of the Proposed System**

**2.2 ARCHITECTURE OF THE PROPOSED SYSTEM**

This blockchain-based insurance claim process involves several key players: policyholders, insurance companies, doctors, and law enforcement. The policyholder initiates a claim through a user interface, uploading supporting documents like medical records and police reports. A smart contract on the Ethereum blockchain network then verifies the authenticity of these documents and checks if the claim adheres to the policy terms. If everything is in order, the smart contract automatically facilitates a payout to the policyholder in cryptocurrency. This approach utilizes the Ethereum Virtual Machine (EVM) to execute the smart contract code securely and consistently. Additionally, the insurance company might leverage a database like MongoDB to store policyholder information for reference. Overall, this architecture streamlines the claim process by automating verification and payouts through smart contracts, potentially leading to reduced costs for insurers and faster settlements for policyholders.



**Fig -2 Architecture of the Proposed System**

### 3. CONTROL FLOW OF MODULES

The process begins with user authentication and registration. This step ensures that only authorized users can submit claims. Next, the system verifies the user’s policy to confirm eligibility. Once eligibility is confirmed, the claim submission process commences. The claimant enters details about the claim and uploads supporting documents. Following submission, the claim undergoes verification. This verification may involve reviewing the submitted documents and contacting relevant parties to confirm the claim’s validity. Once the claim is verified, a decision is made regarding authorization. If the claim is authorized, compensation is awarded. If the claim is denied, the claimant is notified of the decision. Finally, the claimant receives a notification regarding the outcome of the claim.

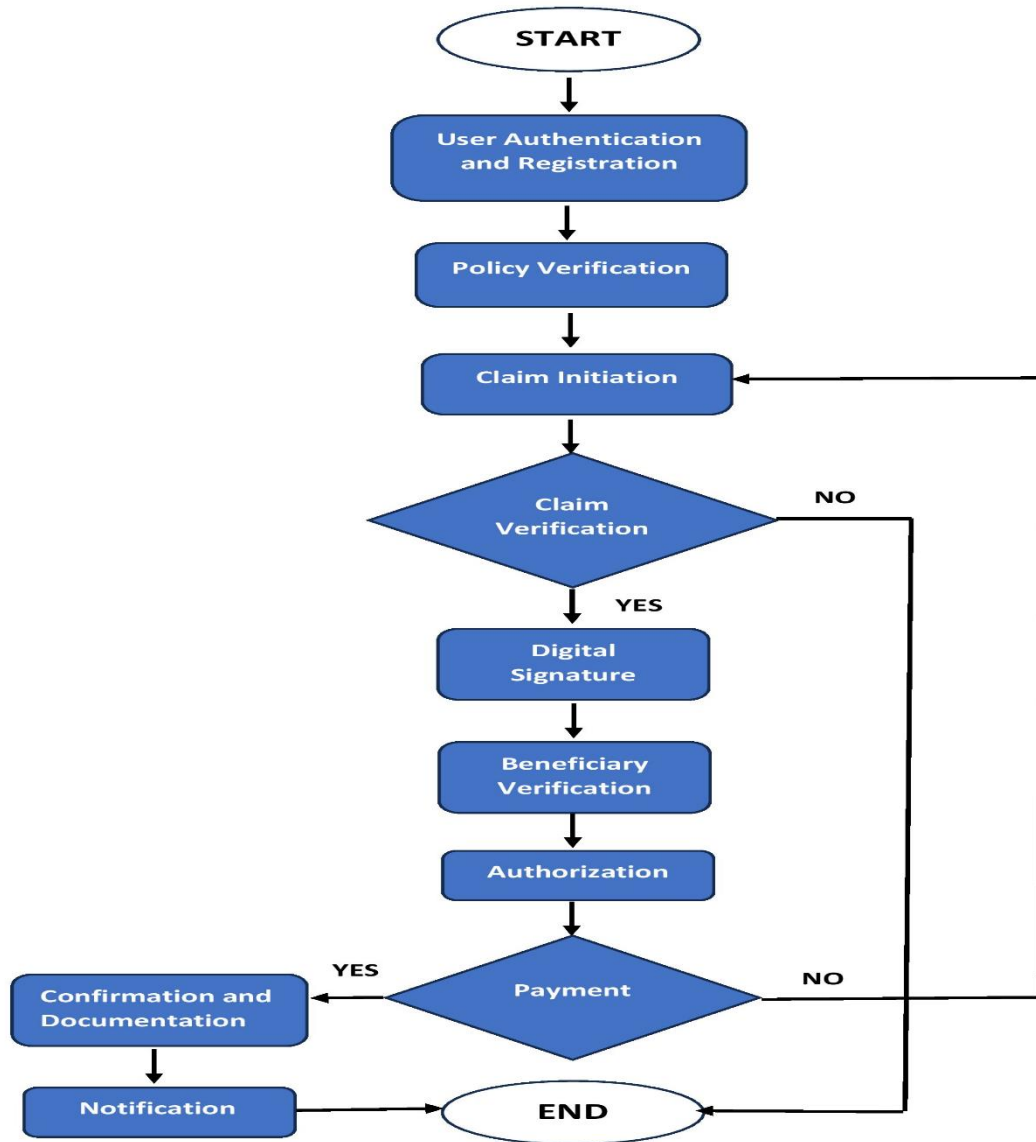


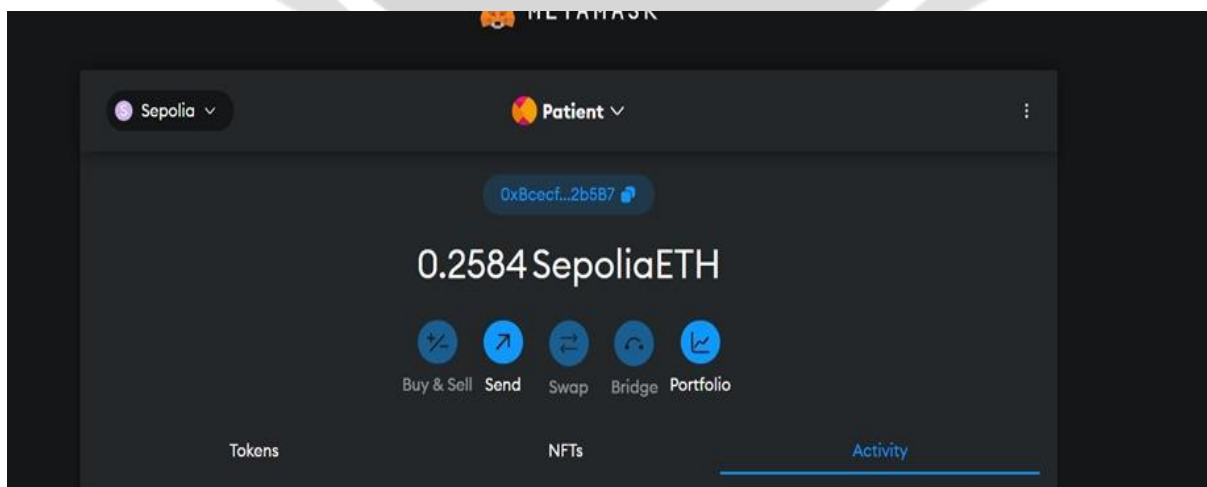
Fig -3 Control flow of the Existed System

### 3.1 ADVANTAGES OF OUR PROPOSED SYSTEM

1. **Transparency and Traceability:** Blockchain's immutable ledger ensures transparency by providing a comprehensive, auditable record of all transactions and interactions within the claims process. This transparency instills trust among stakeholders, as they can verify the integrity of data and track the progress of claims in real-time.
2. **Enhanced Security:** Blockchain's cryptographic principles and decentralized architecture significantly bolster security by safeguarding sensitive data and preventing unauthorized access or tampering. Each transaction is encrypted and linked to previous transactions, making it virtually impossible for malicious actors to alter or manipulate information without detection.
3. **Efficiency and Streamlined Processes:** The elimination of manual, paper-based documentation and the automation of processes through smart contracts streamline claim processing, reducing administrative overhead and minimizing the risk of human error. This efficiency leads to faster claim settlements, improving overall customer satisfaction and retention.
4. **Cost Reduction:** By reducing the need for intermediaries and administrative tasks, blockchain technology helps insurers lower operational costs associated with claims processing. Additionally, the automation of certain tasks and the prevention of fraudulent activities contribute to further cost savings for insurance companies.
5. **Fraud Prevention and Detection:** The transparent and immutable nature of blockchain records, coupled with the integration of automated surveillance systems, enables proactive fraud detection and prevention. Suspicious activities can be flagged in real-time, allowing insurers to investigate and mitigate risks promptly, thus reducing fraudulent claims and associated financial losses.
6. **Improved Customer Experience:** Blockchain technology empowers policyholders by providing greater control over their data and enabling self-service options for claims submission and tracking. The transparency, security, and efficiency offered by blockchain enhance trust and satisfaction among customers, ultimately strengthening the insurer-policyholder relationship.

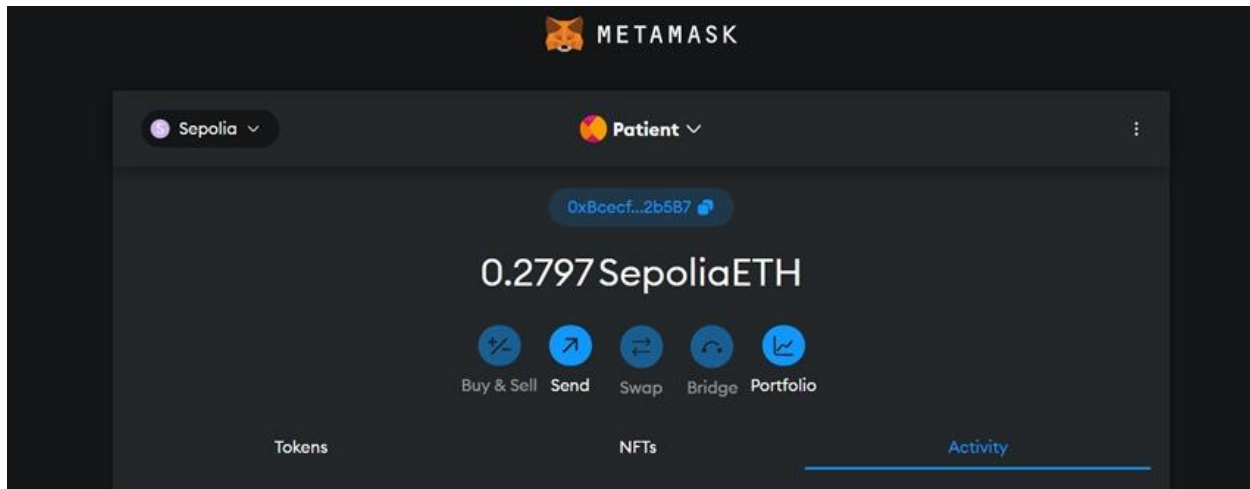
### 3.2 RESULT ANALYSIS

- i) At first, if the user/Patient needs to claim the insurance they need to provide the required documents.
- ii) Now the submitted documents are forwarded to the Hospital admin, Lab admin and Insurance Claim Accounts in Blockchain.
- iii) Verification of documents is done by the lab admins and Hospital admin using Smart Contracts.
- iv) At last the insurance team checks the legitimacy of the user and documents that are been approved by the concern team.
- v) If everything goes well, the insurance amount is sent to the user/patient account.



**Fig -4 User Account before Transacting the money**





**Fig -5 User Account After Transacting the money**

#### 4. CONCLUSIONS

In conclusion, the integration of blockchain technology into insurance claiming processes represents a significant advancement with transformative implications for the industry. Through its inherent features such as transparency, security, efficiency, and fraud prevention, blockchain technology offers a myriad of benefits that address longstanding challenges and inefficiencies in traditional insurance practices. The transparency provided by blockchain's immutable ledger fosters trust among stakeholders by ensuring the integrity and traceability of data throughout the claims process. This transparency, coupled with enhanced security measures, not only reduces the risk of fraud and unauthorized access but also accelerates decision-making and expedites claim settlements. Moreover, the automation facilitated by smart contracts streamlines administrative tasks, minimizes the potential for human error, and reduces operational costs for insurance companies. This increased efficiency translates into faster and more seamless experiences for policyholders, ultimately enhancing customer satisfaction and loyalty. Furthermore, the proactive fraud prevention capabilities enabled by blockchain technology, coupled with automated surveillance systems, empower insurers to detect and mitigate risks in real-time, thereby safeguarding their financial interests and preserving the integrity of the insurance ecosystem. Overall, the adoption of blockchain technology in insurance claiming processes holds immense promise for revolutionizing the industry, driving improvements in transparency, security, efficiency, and customer experience. As insurers continue to embrace and implement blockchain solutions, they stand to realize significant competitive advantages while better serving the needs of policyholders in an increasingly digital and interconnected world.

#### 5. REFERENCES

- [1]. Agarwal, A. (2008), "Repudiation the last resort", IRDA Journal, September, pp. 23-25.
- [2]. Ang, J.S. and Lai, T.-Y. (1987), "Insurance premium pricing and rate making in competitive insurance and capital asset markets", Journal of Risk and Insurance, Vol. 54, pp. 767-779.
- [3]. Krishnamurthy, S., Jhaveri, N., Bakhshi, S., Bhat, R., Dixit, M.R. and Maheshwari, S. (2005), "Insurance industry in India: structure, performance, and future challenges", Vikalpa: The Journal for Decision Makers, Vol. 30 No. 3, pp. 93-119.
- [4]. Tennyson, S. and Salsas-Forn, P. (2002), "Claims auditing in automobile insurance: fraud detection and deterrent objects", Journal of Risk and Insurance, Vol. 69 No. 3, pp. 289-308.
- [5]. Berryhill, J., Bourgerly, T., & Hanson, A. (2018). Blockchains Unchained. 28.