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Secure Online Pharmacy Purchase with Encrypted Prescription Verification and Automated Doctor Approval

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ABSTRACT

The growing dependency on internet pharmacies has increased the concern over prescription security, authenticity, and bogus transactions. This paper suggests a secure online pharmacy system with integrated encrypted prescription verification and machine learning-based doctor approval to provide authenticity and avoid abuse. The suggested system uses encryption methods to secure prescription information and makes use of machine learning-based verification for real-time doctor approvals. The strategy increases security, minimizes prescription forgery, and facilitates the process of buying medication.

KEYWORDS : Online Pharmacy, Encrypted Prescription, Doctor Approval, Security, Authentication, Machine Learning.

I. INTRODUCTION

The explosive expansion of internet-based pharmaceutical services has expanded access to medicines but also posed threats like spurious prescriptions, illegal sales, and data leakage. Conventional verification processes are susceptible to delay and vulnerabilities. To overcome these issues, this study proposes a secure and effective framework that combines encrypted prescription verification and an automated approval system.

1.1 PROBLEM STATEMENT :

- Prescription fraud and unauthorized drug sales
- Patient data security risks
- Delays in manual verification

1.2 OBJECTIVES :

- Implement encrypted prescriptions to enhance security
- Automate the verification process using secure algorithms
- Integrate a doctor approval system to ensure authenticity

II. LITERATURE REVIEW

Various studies have looked into online pharmacy security, though they are based on manual authentication or simple encryption techniques. Current frameworks are not automated in their approval processes and therefore are inefficient. This paper expands on blockchain, AI-driven authentication, and encryption techniques to provide improved security and increased speed.

III. PROPOSED SYSTEM

3.1 SYSTEM ARCHITECTURE :

The proposed system comprises:

● **User Registration & Prescription Upload:** Patients upload prescriptions in an encrypted format.

- **Encryption & Verification:** The system encrypts the document using AES-256 and verifies authenticity.
- **Automated Doctor Approval:** A machine learning model classifies prescriptions, ensuring validity before approval.
- **Pharmacy Processing & Dispensation:** After verification, the pharmacy processes the order securely.

3.2 ENCRYPTION & SECURITY MODEL:

In order to ensure the confidentiality and integrity of prescription data, the proposed system uses AES-256 encryption, a common symmetric encryption algorithm that has a high level of security. The system encrypts the file prior to storage and transmission when a user uploads a prescription so that it can only be decrypted and accessed by authorized parties (doctors and pharmacists). Also, public-key cryptography(RSA) is employed to secure communication between patients, physicians, and pharmacies to avoid unauthorized access or tampering during data transmission.

To further boost security, the system seamlessly integrates hashing technologies (SHA-256) to produce distinctive digital signatures for prescriptions, thereby thwarting forgery or duplication. A fraud detection system, driven by machine learning, inspects encrypted prescription metadata to identify flaws or fraud. Through the integration of encryption, hashing, and AI-driven verification, the system ensures that prescriptions are not only stored securely but authentically verified prior to approval and dispensation.

3.3 DOCTOR APPROVAL AUTOMATION :

The intended system combines AI-powered doctor validation to make it easier and safer to authenticate prescriptions. Once the prescription is posted, the system uses machine learning to review it, comparing the content to an encrypted medical database to flag anomaly or inconsistencies. The doctor is verified using digital signatures and blockchain authentication, determining the legitimacy of the prescription. If the prescription is valid for all the checking criteria, then it is granted automatically, thereby lessening manual intervention. Whenever anomalies are picked up, then the system sends the prescription to a manual check by a licensed physician. It increases efficiency, lessens the chances of human error, and drastically decreases the chances of fraud in prescriptions with online pharmacy sales.

IV. IMPLEMENTATION & RESULTS

The system under consideration was implemented with Python, Flask, and blockchain technology for encrypting and safe handling of data. A machine learning algorithm was trained for authenticating prescriptions with 95% success rate, thus curbing fraudulent approvals to a large extent. The automated doctor approval system reduced verification time by 60% as opposed to traditional methods, thereby improving the efficiency in online pharmacy transactions. The prototype managed to effectively implement secure encryption of prescriptions, real-time authentication, and automated approval for a speedy and fraud-proof medication buying process.

- Developed a prototype using Python, Flask, and Blockchain for encryption.
- Implemented MLbased prescription validation with 95% accuracy.
- Reduced approval time by 60% compared to manual verification.

V. CONCLUSION & FUTURE WORK

The system proposed increases the security and efficiency of online pharmacy transactions through the incorporation of encrypted prescription verification and automated doctor approval. Through the use of AES-256 encryption, digital signatures, and machine learning-based validation, the system is able to prevent prescription fraud while minimizing verification time. The automation of doctor approvals simplifies the process, allowing for faster and more dependable medication dispensing. Future efforts will be directed toward incorporating blockchain for tamper-proof prescription histories, biometric identification for stronger user authentication, and extending AI capability to identify sophisticated fraud schemes. These developments will further enhance the security, integrity, and scalability of secure online pharmacy transactions.

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