

Department of Information Technology

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A Project Report on

Healthchain:

An Electronic Health Profile Storage Using Blockchain

Submitted in fulfillment of the degree of
Bachelor of Engineering(Sem-8)

in

INFORMATION TECHNOLOGY

By

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1. Project Conception and Initiation

1.1 Abstract

- With an ever-increasing population, the number of diseases is also increasing in today's world. Every year, approximately 60% of the population is diagnosed with a variety of health problems.
 - As a result, the number of health records is growing, some of which are stored digitally and others physically.
 - Maintaining a personal health record for an individual can also be time-consuming, as it runs the risk of being misplaced or damaged.
 - Our project focuses on making the entire process more convenient for patients and healthcare providers by digitising it.
 - It focuses on converting all health records into Electronic Health Records (EHR) and storing them on blockchain because it saves money and improves performance.
 - Healthchain is a platform that digitalizes the entire patient experience, from health records to medical bill payments, all in one place.
 - Healthchain also provides doctors with information about the patient's medical history.
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1.2 Introduction

- Blockchain technology has the potential to transform health care by placing the patient at the center of the health system and increasing the security, privacy, and interoperability of health data.
- This technology could provide a new model for health information exchange (HIE) by making electronic health records (EHRs) more efficient and secure.
- EHRs contain critical and highly sensitive private information for diagnosis and treatment in healthcare.
- These data are a valuable source of healthcare intelligence.
- The sharing of healthcare data is an essential step toward making the healthcare system smarter and improving the quality of healthcare service.
- The five basic principles underlying the technology.
- Distributed Database, Peer-to-Peer Transmission, Transparency with Pseudonymity, Irreversibility of Records, Logic Computation.

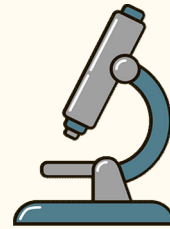
1.2 Introduction



Doctor



Hospital



Lab



Pharmacy



Insurer



1.4 Objectives

- Collaboration Among Healthcare Organizations: It is made possible by providing the healthcare industry with a single, standardised, and consistent database of real-time patients secured with blockchain.
- Safe Data Exchanges: Blockchain protects data while also providing comprehensive data sharing options, allowing patients to unlock only the data required by their healthcare providers while keeping the rest private and secure.
- Valuable Insights for Better Care: Every day, a massive amount of health data is created; it can be a tedious task for patients to keep this data physically, as well as for doctors to go through this vast data every time, which can lead to missing important data in the process.
- Complete healthcare services, including appointment scheduling, video calling, and electronic health record storage.

1.3.1 Existing System

- EHR is a record of the care you receive from your doctors or medical facilities.
- It is created and maintained by health care providers and contains information about health issues, medications, and treatments. If you visit a lot of doctors, you might have a lot of EHR.
- The patient's data is stored in the cloud or on the local databases of various organisations by EHR systems.
- Its goal is to convert paper-based medical records into electronic medical records.
- The data could be stored in an encrypted format or not.
- Some of this information is available to the patient, whereas others may be restricted to the organisation and cannot be shared.

1.3.2 Existing System

- Practo
- An app that can be used to get health checks done right away at the nearest pathology, connect with doctors in your area, and book an online appointment.
- Practo is an online tool designed to assist doctors, labs, and hospitals in managing patient data.
- It also assists patients by sending them digital reminders about doctor's appointments.
- It offers two portals: [practo ray](#) and [practo.com](#).
- The former is a doctor management software for doctors that requires a monthly subscription, while the latter is a consumer portal that is free for both patients and doctors.

1.4 Problem Definition

- Hospitals keep patient data in their database; similarly, lab reports are kept in the laboratories database, and medical bills are kept in the pharmacies database.
- All of this dispersed data makes it difficult for the patient to maintain, store, and verify insurance claims.
- Furthermore, hospitals are sometimes hesitant to share data with patients or other doctors from other hospitals; there is a lack of transparency in the traditional system, and there is a need for centralization and communication among the various entities.
- Patient data is redundant on various organisations' individual databases, and the security of this data is jeopardised if the database experiences errors.
- The flow of communication between patients and doctors is an essential component of medical treatment.
- We all felt the need for digitalization during the covid situation, from online appointment booking to video call scheduling.

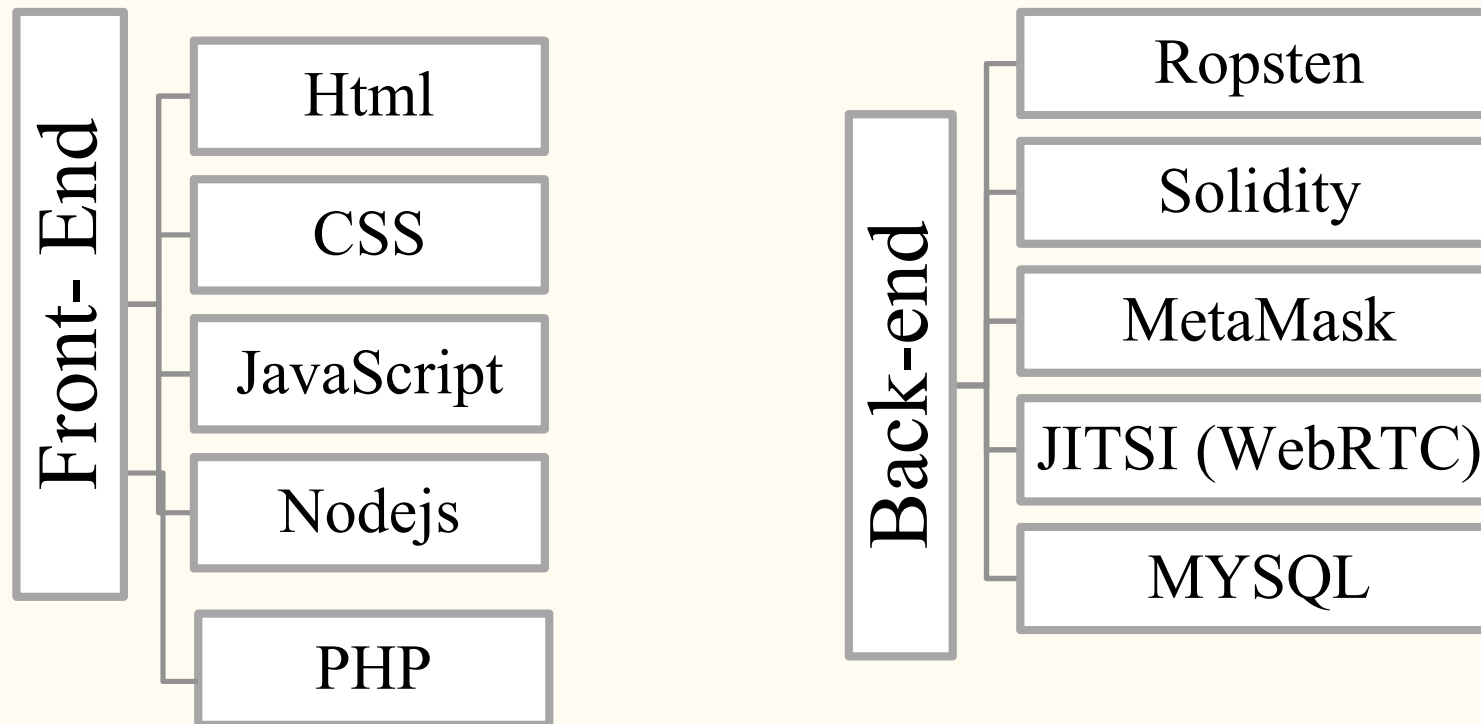
1.5 Scope

- Healthchain in the form of a web application will provide ease to the healthcare providers and patients since it will be a one-stop location for all the records and meeting, scheduling.
- Healthchain also makes it easy for the healthcare providers to collaborate, example Doctor A can easily read Doctor B's prescription from the patients' medical history record and can proceed with diagnosis much quickly.
- Data being present at Healthchain also helps Insurance companies to verify the bills and records easily.
- Data losses and redundancy will be minimized, as it is a centralized system that can be used at hospitals, clinics, and labs.

1.5 Scope

- Security Issue and data tampering with the medical records is minimized since the granular access to the data lies with the patients and only with the access from the patient the healthcare providers can add the data on the blockchain in an encrypted format.
- Data analysis on the patients' medical records which are of utmost importance to understand a patient's medical history, will help the healthcare providers with better insights which in turn will help for better diagnosis.

1.6 Technology stack



1.7 Benefits for environment & Society

- Because it is entirely online, it can be accessed at any time and from any location.
- Medical data is stored on the blockchain, which reduces the use of paper, which is susceptible to damage over time. In addition, digital storage makes it easier to access, search, and append data.
- Blockchain has the advantage of not being controlled or owned by any entity, and because it is a decentralised system, transparency is maintained.
- Patients can concentrate on their recovery rather than the hassle of managing, transporting, and storing medical data.
- During appointments, patients may forget to convey a medical history that could have assisted the doctor in making a better diagnosis; this is overcome by using healthchain, which provides valuable insights to the patients' medical history.

1.7 Benefits for environment & Society

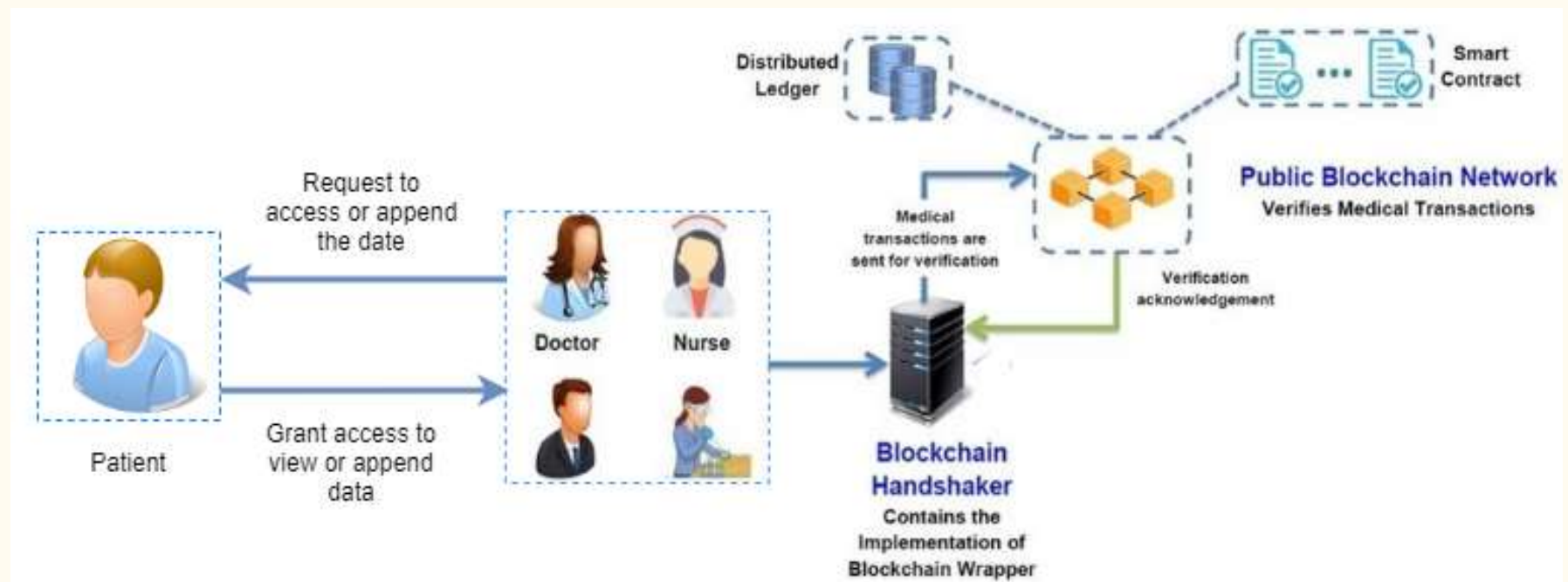
- The challenges of result shifting and data snooping are addressed by blockchain technology. The system allows for the transfer of time-stamped permanent records of clinical trials and research outcomes, reducing the occurrences of fraud and error in clinical test records.
- The medical record is the most comprehensive record of a person's identification and must be handled with care. Blockchain technology has proven to be extremely effective in ensuring the integrity and security of medical records. Because blockchain-encrypted data cannot be changed or deleted.



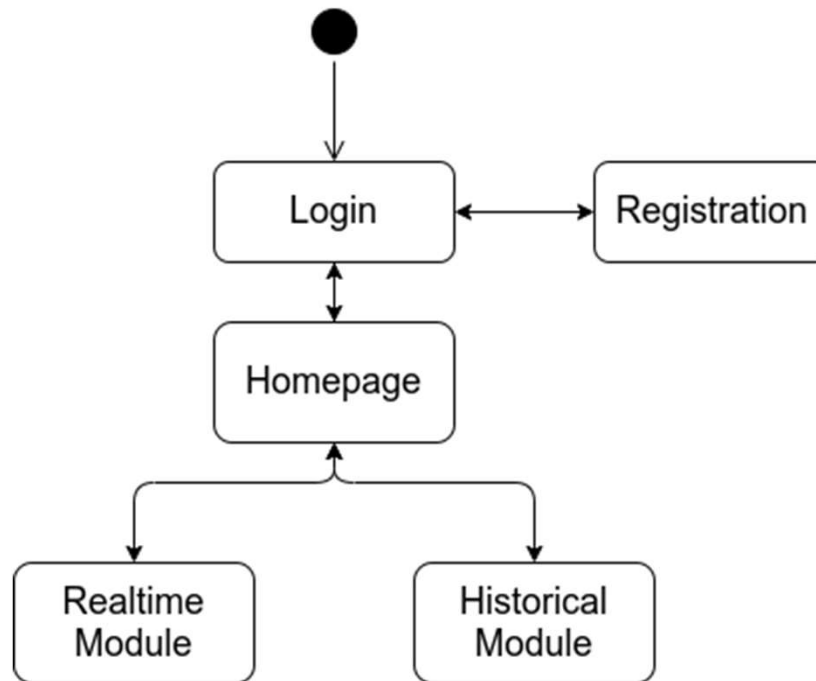
2. Project Design



2.1 Proposed System

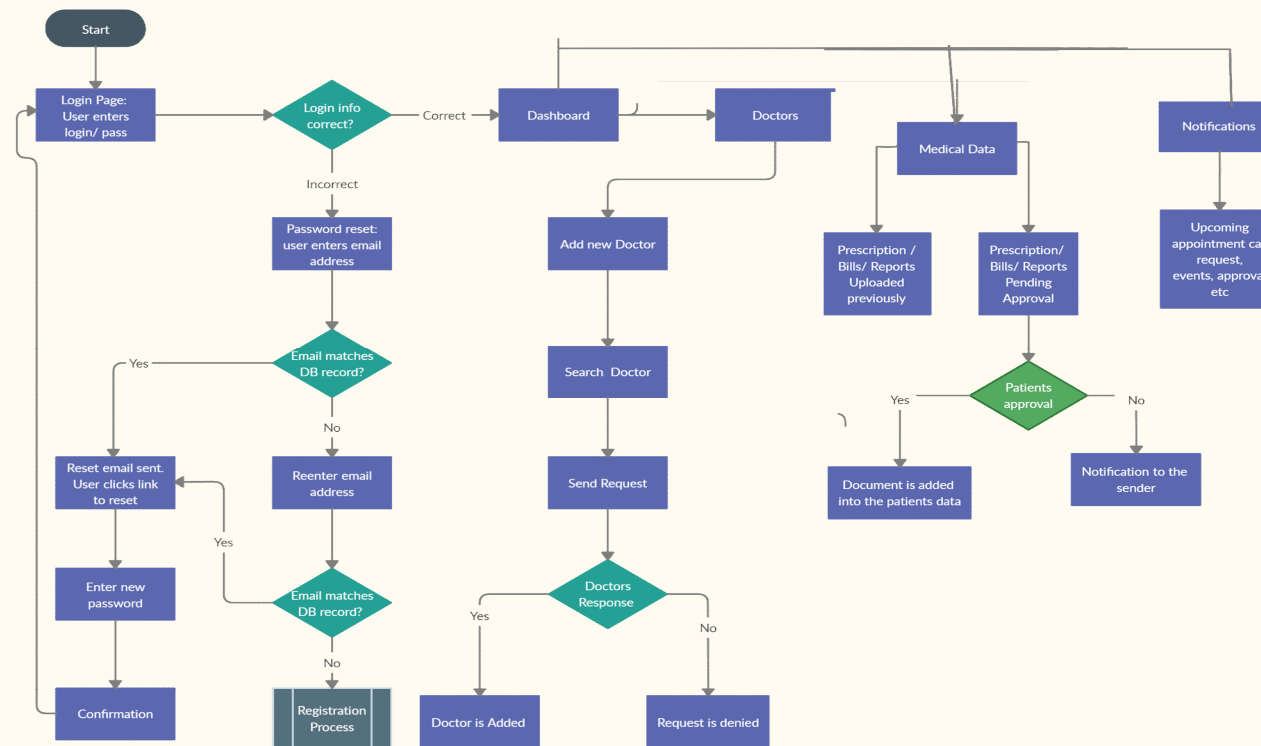


2.2 Design(Flow Of Modules)



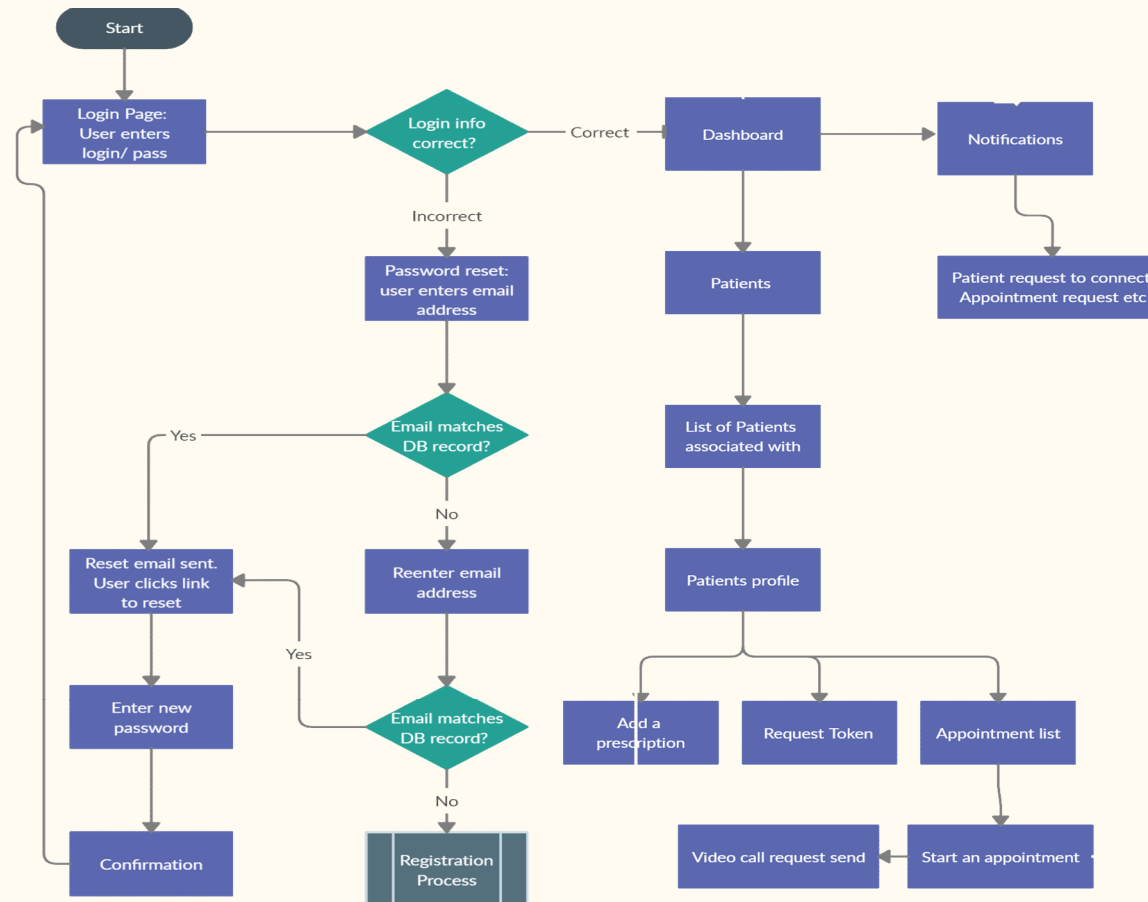
2.2 Design(Flow Of Modules)

➤ Patient



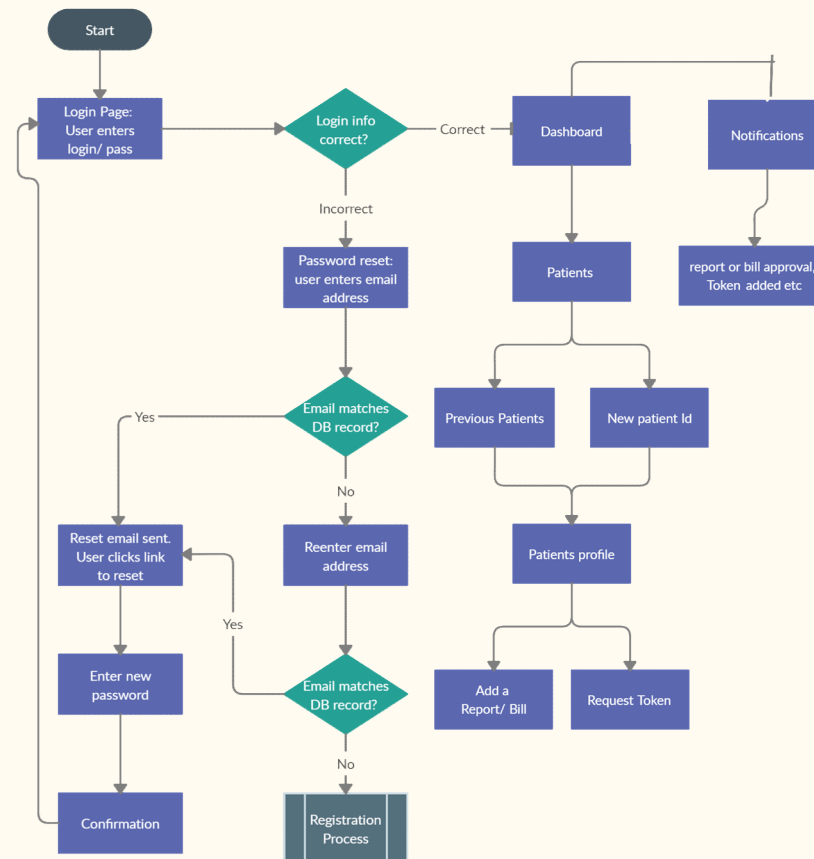
2.2 Design(Flow Of Modules)

➤ Doctor



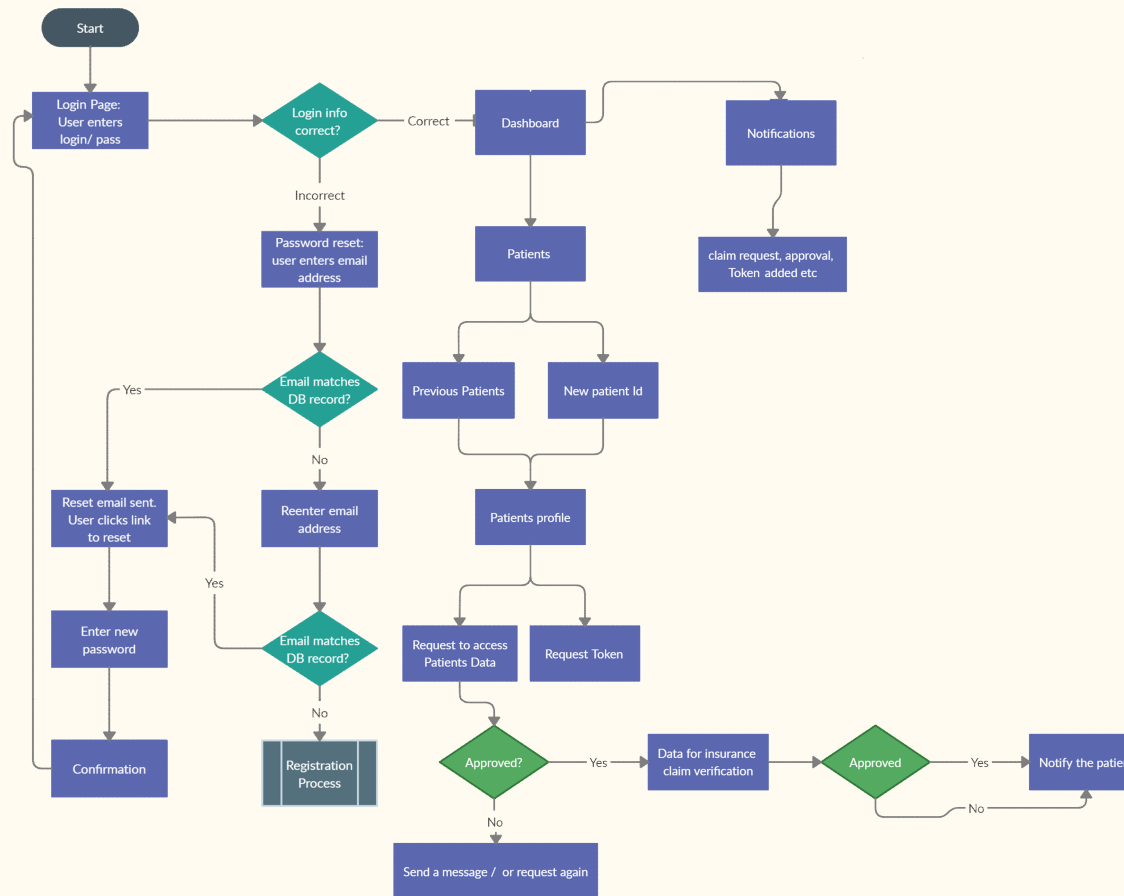
2.2 Design(Flow Of Modules)

➤ Labs



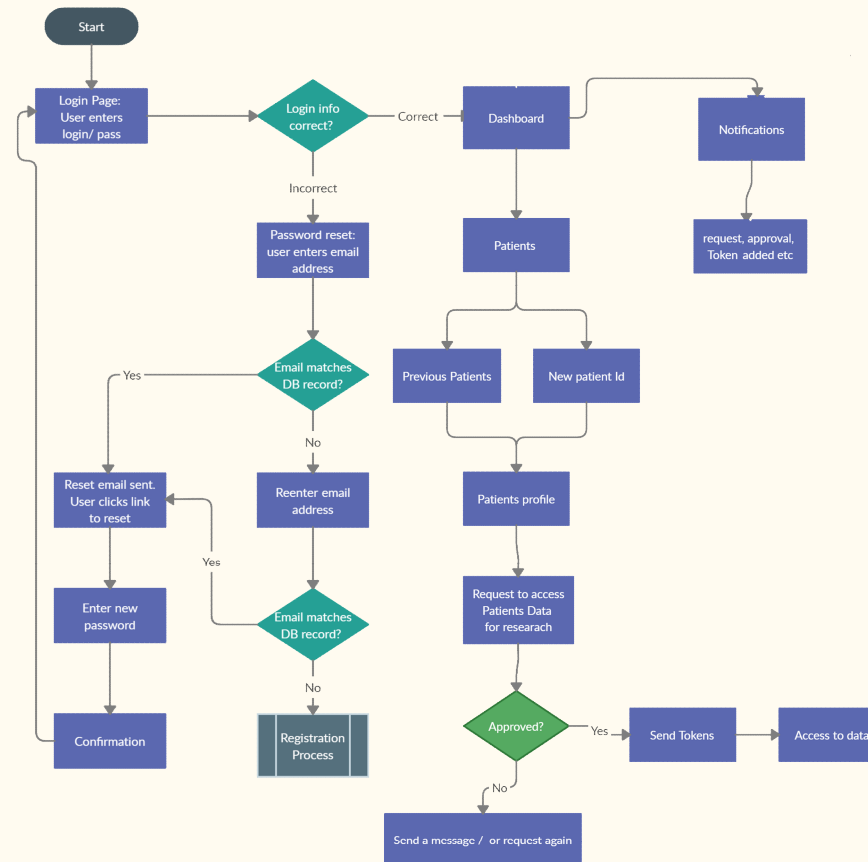
2.2 Design(Flow Of Modules)

➤ Insurer

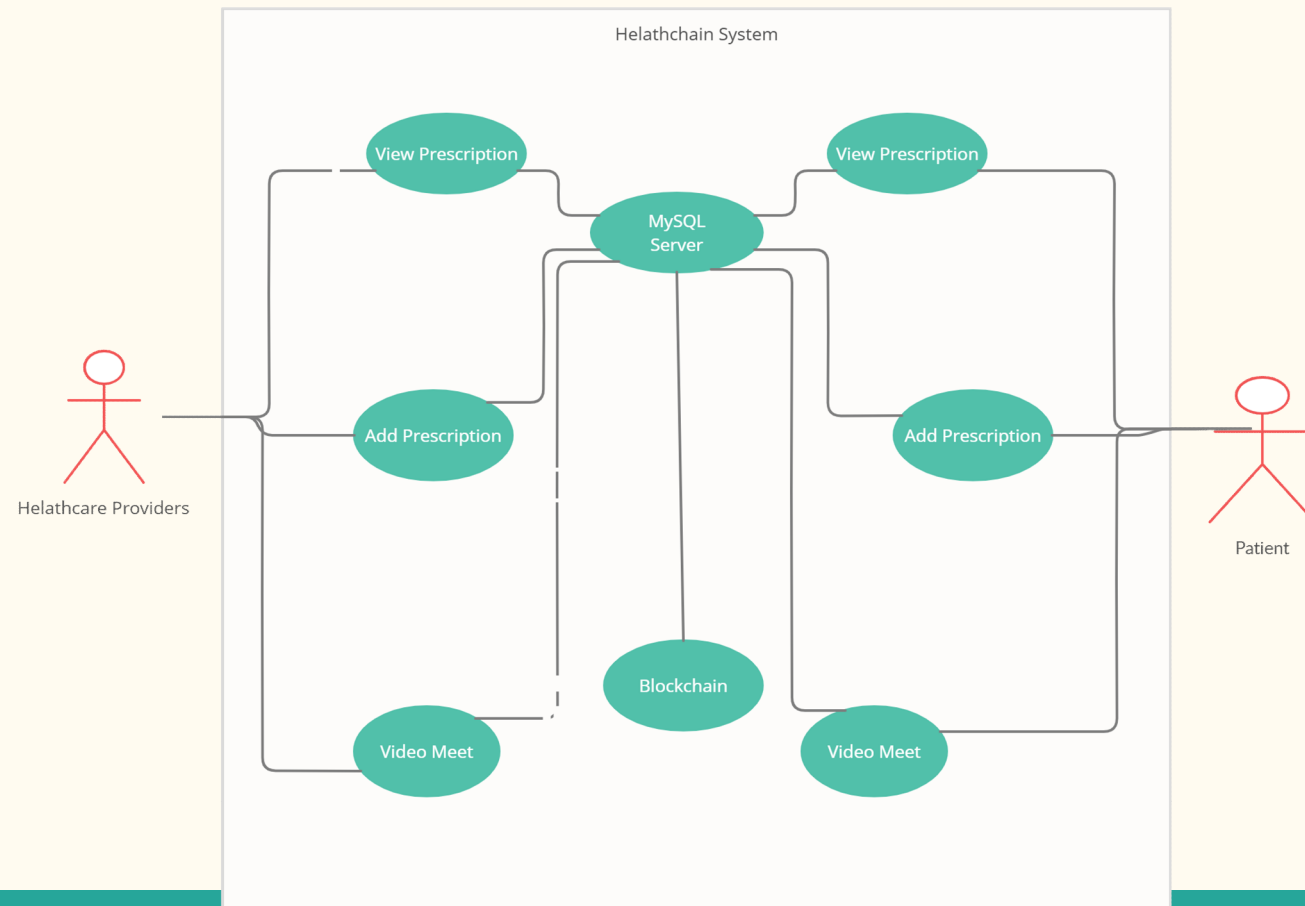


2.2 Design(Flow Of Modules)

➤ Pharmaceutical



2.3 Description Of Use Case



3. Conclusion and Future Scope

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3.1 Conclusion

- In this project, Healthchain is proposed as an online healthcare framework that provides a complete solution for electronic health records and service management.
- The blockchain framework for EHR management is intended to give patients ownership and control over their EHRs.
- Patients can securely control access to documents and track how records are used, as well as allow secure record transfer and reduce the ability of unauthorised actors.
- It aims to solve the current digital problems in the healthcare sector by providing centralization, security, and features such as video calls, making Healthchain the one-stop application for all your health documents and services.

3.2 Future Scope

- In the future, we intend to learn more about a better payment system; currently, tokens are used, but a better module for the same item can be developed.
- Machine learning and automation can be applied to medical data to predict patients' health problems in real time. It will assist healthcare providers in providing more efficient and immediate healthcare services.
- Healthchain is a simple blockchain-based application for EHRs that meets some basic requirements. More functionalities and roles, as well as more extensive testing, are required for it to be used by a hospital network.
- Before large-scale production deployments, more research will be needed to determine the scalability, security, and cost-effectiveness of blockchain technology.

2.7 References

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Thank You

