CS4092 Final Year Project

Project Title

Applying Federated Learning With Smart Contracts In Health Care

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Project Progress Report

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1 INTRODUCTION

We are designing a medical health care system that will give patients a comprehensive, immutable log and easy access to their medical information across providers and treatment sites.

Leveraging unique block chain properties, our system manages authentication, confidentiality, accountability, and data sharing—crucial considerations when handling sensitive information. A modular design integrates with providers' existing, local data storage solutions, facilitating interoperability and making our system convenient and adaptable.

The block content represents data ownership and viewership permissions shared by members of a private, peer-to-peer network. Blockchain technology supports the use of "smart contracts," which allow us to automate and track certain state transitions (such as a change in viewership rights or the birth of a new record in the system). Via smart contracts on the Ethereum blockchain, we log patient-provider relationships that associate a medical record with viewing permissions and data retrieval instructions (essentially data pointers) for execution on external databases. To ensure integrity, we include on the blockchain a cryptographic hash of the record to ensure against tampering, thus guaranteeing data integrity.

We use AI models that are being transferred via smart contracts to our targeted devices which trained the model Providers can add a new record associated with a particular patient, and patients can authorize the sharing of records between providers. In both cases, the party receiving new information receives an automated notification and can verify the proposed record before accepting or rejecting the data. This keeps participants informed and engaged in the evolution of their records.

2 TIMELINES

Share the timeline here from project Part 1 final.

2.1 TIMELINE (till Mid 1)

- Federated Learning model done with data analysis data validation data preprocessing & built with dataset model

2.2 TIMELINE (Mid 1 till Mid 2)

- Fl model will be deployed & integrated with blockchain and our web application interface

2.3 TIMELINE (Mid 2 till Final)

- Fully operated system with full documentation tested with every possible scenario & blockchain will be tested on hardhat.

3PROGRESS

3.1 MILESTONE 1 PROGRESS

Federated learning models milestone could include the following elements:

Data collection and preparation: This includes collecting and cleaning data from participating devices, which can be a time-consuming process.

Model development: Model typically is designed for Liver disease. It predicts on the basis of data with various dataset columns

Federated Learning Model: Federated Models typically involve developing a centralized model that is transported to various multiple devices and can be trained on data from multiple devices without actually collecting that data.

Testing and validation: Once the federated learning model has been developed, the model will be tested and validated to ensure that it performs well on new data

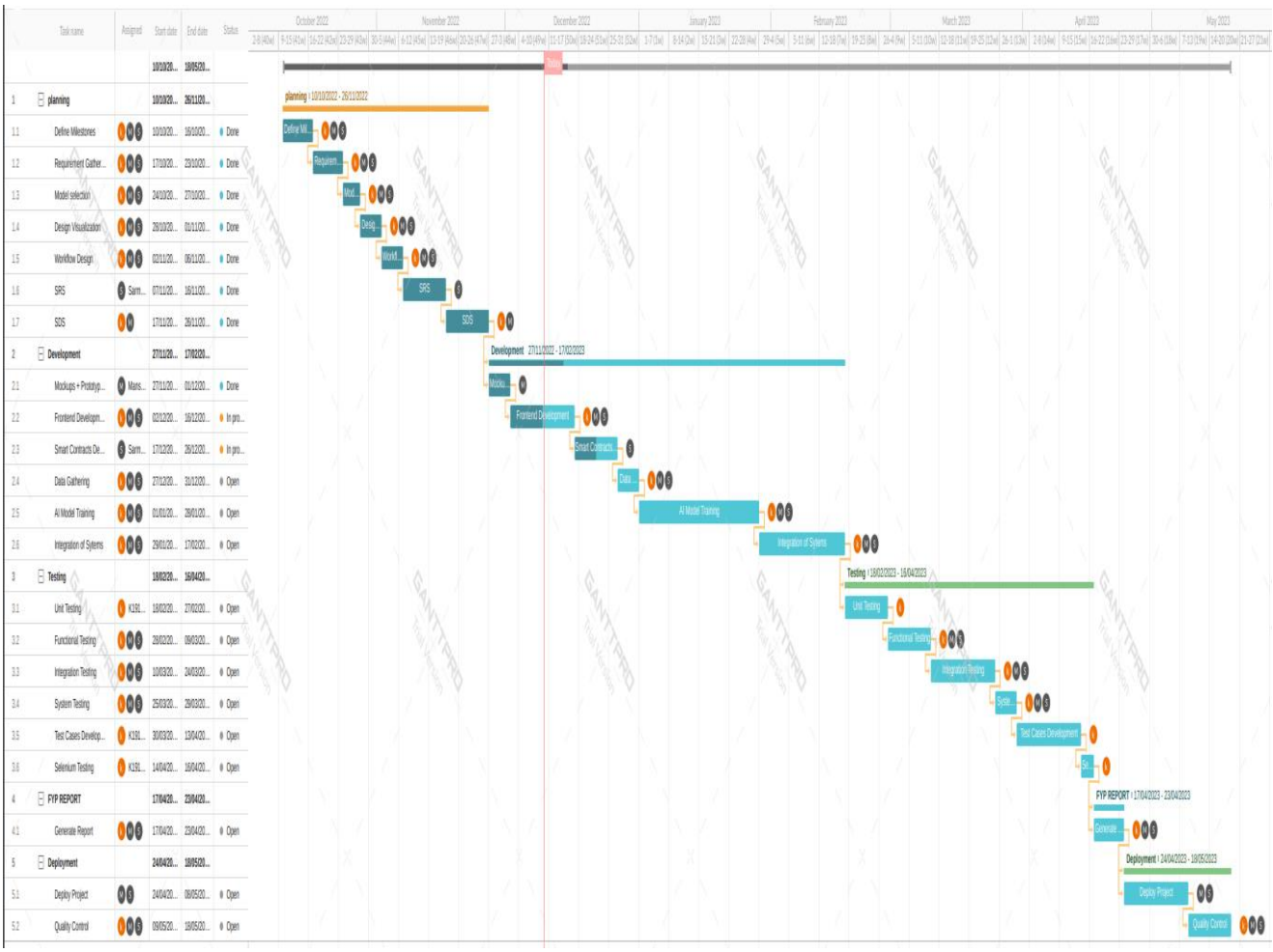
3.2 MILESTONE 2 PROGRESS

Deployment and monitoring: Finally, a federated learning model must be deployed Globally and model will be integrated with the Web Application interface and blockchain

3.3 MILESTONE 3 PROGRESS

We will provide you a full documented system with complete functionalities testing every possible scenario of the program & all the code of the blockchain will be tested on hardhat

4UPDATED TIMELINE



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REFERENCES