PIP2001 Capstone Project

Review-0

AgroTrack

Batch Number: CIT-G33

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Problem Statement Number: **PSCS59**

Organization: **Mahindra&Mahindra(FarmEq)**

Category (Hardware / Software / Both) : **Software**

Problem Description:

“How can a farmer gain access to all the elements of his farming cycle? one stop shop where he has access to information from different aggregators, for retailing , leasing & finally taking his produce to the nearest mandi. Application to provide a means of easy transaction for all his farming activities and his personal expenses. Agri credit should help him buy/lease Farm Machinery & have access to all the local vendors for his plantation needs including expert advice from the local university.”

Difficulty Level: **Complex**

Analysis of Problem Statement

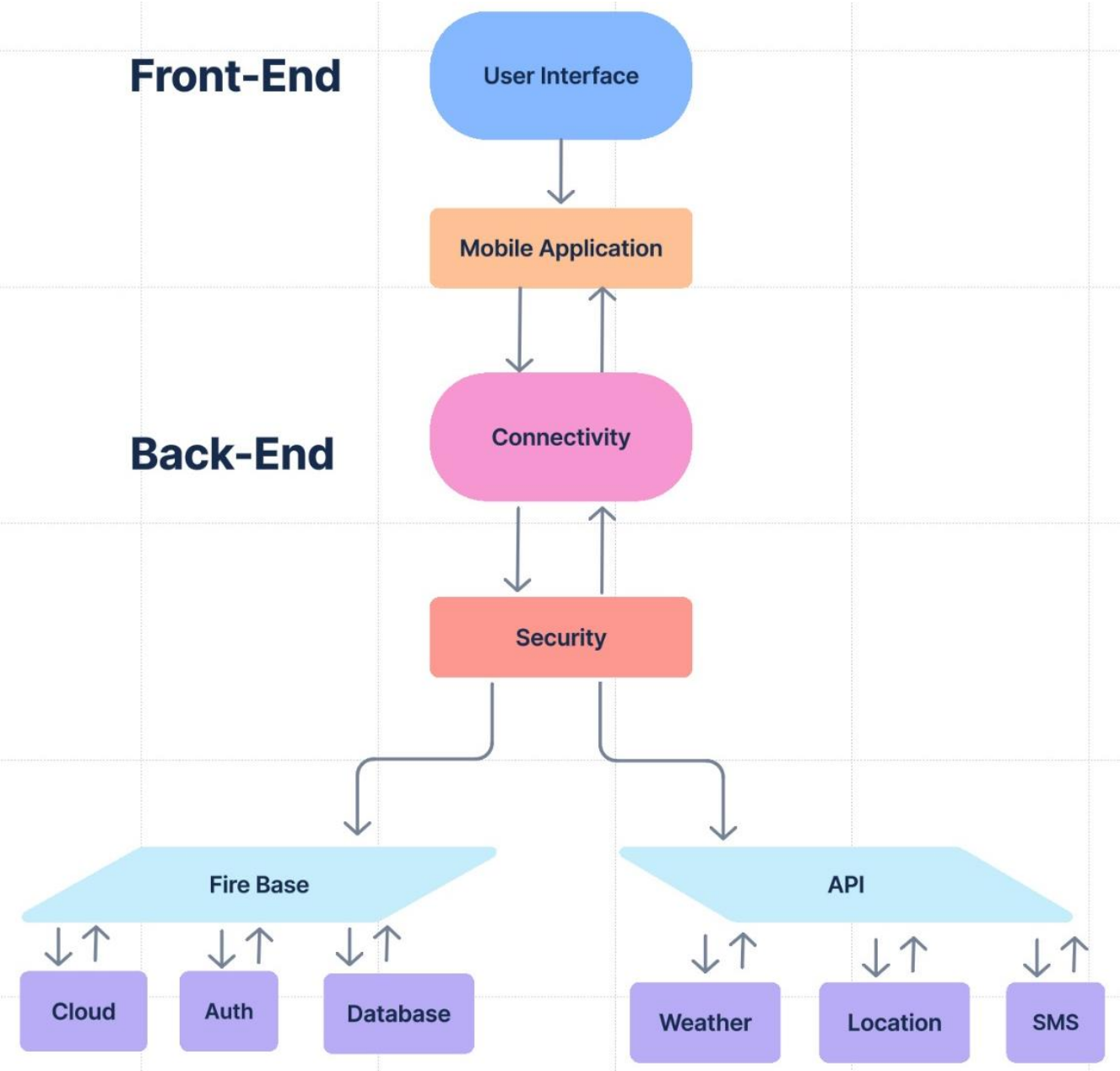
Technology Stack Components:

Front-End:

- User Interface
- Mobile Application

Back-End:

- Connectivity Layer
- Security Layer
- Firebase
- API’s



Software Requirements:

1. Development Platform:

IDE: Android Studio (used for building and testing the app).

Programming Language: Java (primary language for Android app development).

Gradle: For project build automation and dependency management.

2. API Integration:

RESTful APIs: To integrate external services like weather updates, market prices, etc.

Google Maps API: For geolocation features to locate the nearest mandi (marketplace) or other relevant locations.

Agricultural APIs: APIs that provide real-time crop recommendations based on weather, soil conditions, and location.

3. Authentication and Security:

Firebase Authentication: For secure user login and registration, including options like Google Sign-in, OTP-based authentication, or email verification.

SSL Encryption: For securing all communications and transactions between the app and the server, ensuring data privacy and protection.

4. Database:

Firebase Firestore: A cloud-based NoSQL database to store user data, market listings, transactions, and related information in real-time.

MySQL (optional): For local or offline data storage when required, ensuring seamless app usage in regions with limited internet connectivity.

5. Backend Services:

Firebase Cloud Functions: Serverless functions to handle backend logic such as notifications, user request processing, or generating estimates for Agri Credit.

Firebase Cloud Messaging (FCM): For sending real-time push notifications about market prices, updates, new deals from vendors, etc.

6. Analytics and Monitoring:

Firebase Analytics: To monitor user engagement, app performance, and behavior, providing insights for improving app functionality.

Firebase Crashlytics: For tracking app crashes in real-time, identifying bugs, and ensuring stability.

Hardware Requirements:

None: This project is entirely software-based and does not require any specific hardware for its functionality.

Basic Laptop: For developing and testing the app using Android Studio.

Android Phone: For testing the application on a real device to ensure proper functionality and user experience.

Key Features of the App:

1. Crop Recommendations Based on Weather:

The app suggests the best crops to grow at any given time, considering the current temperature and weather conditions of the farmer's location.

2. Access to Local and International Markets:

The app connects farmers with both local and wholesale markets, within India and internationally, enabling them to sell their produce directly without relying on brokers.

3. Market-based Price Suggestions:

The app suggests prices for grown crops by considering real-time market data, enabling farmers to understand the actual value of their produce.

4. Farming Tips with Advanced Technology:

The app provides tips and guidance on using new technologies to increase farm efficiency and yield, helping farmers adopt modern farming methods for better results.

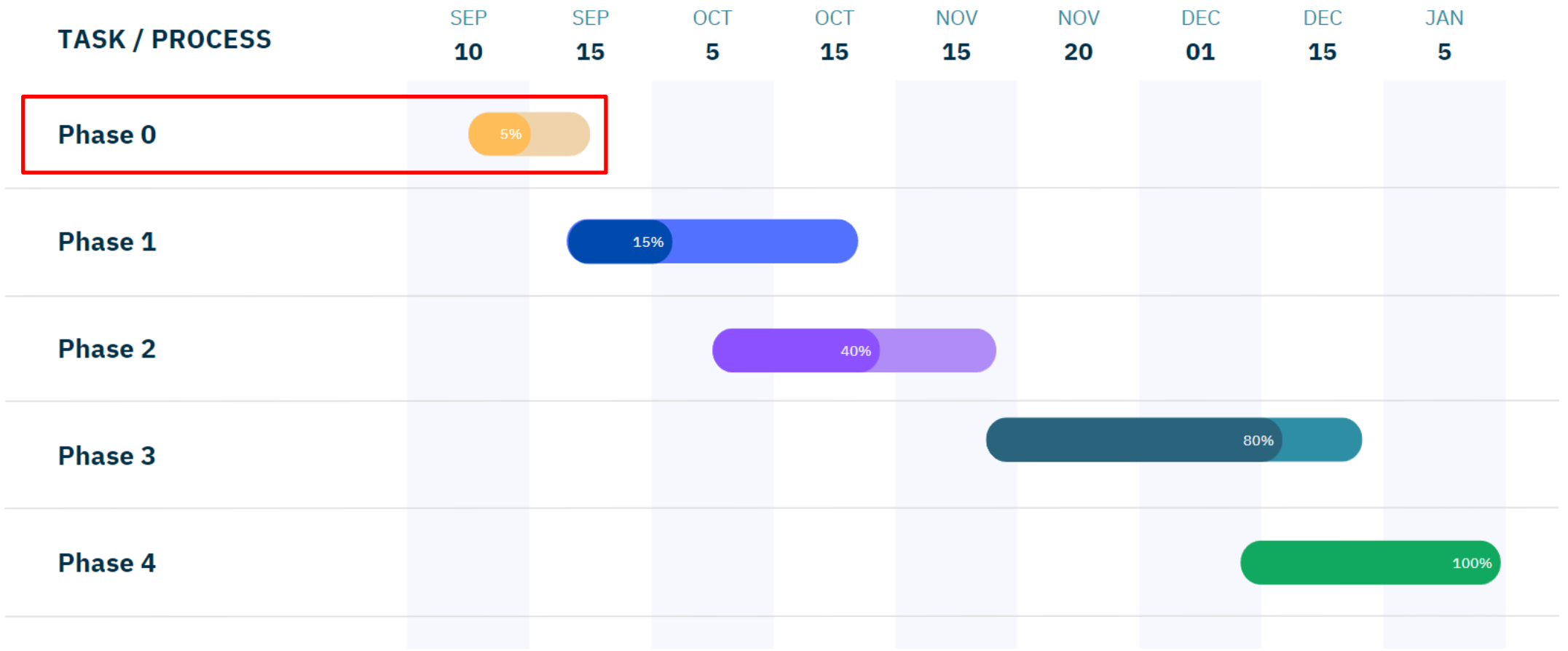
5. Secure Authentication:

The app ensures secure access through proper authentication by verifying government-issued farmer IDs and address proof, preventing fake users from accessing the platform.

6. Agri Credit and Loan Support:

By assessing the farmer's needs for new technology and machinery, the app creates a detailed estimate and sends it to the farmer's home branch. This enables farmers to apply for government-backed loans, helping them adopt advanced farming equipment and techniques.

Project Timeline (Gantt Chart)



Phase 0: Understanding the Problem Statement

Phase 1: Project Proposal and Design

Phase 2: Mid-Term Implementation and Functional Prototype

Phase 3: Final Development, Testing, and System Validation

Phase 4: Final Viva-Voce and Submission

References (IEEE Paper)

• **Magno, L. P., & Moraes, M. L. (2020). Internet-of-Things (IoT)-based smart agriculture: Toward making the fields talk. *IEEE Access*.** Summary: This paper explores IoT applications in agriculture, enhancing decision-making via real-time data from sensors, aligning with your app's weather data and crop recommendations.

• **Silva, J. L., & De Souza, M. C. (2019). A farmer's mobile market: Agricultural e-commerce. *IEEE Transactions on E-Commerce*.** Summary: This paper focuses on e-commerce solutions for agricultural products, aligning with your app's market connection features for farmers globally.

• **Sharma, A. N., & Verma, K. (2021). Smart agricultural data management system. *IEEE Systems Journal*.** Summary: This paper discusses data management systems for agriculture, similar to your app's market listings, crop prices, and vendor details.

• **Patel, P. S., & Jain, R. K. (2018). Mobile applications for farmer market and crop forecasting. *IEEE Mobile Computing*.** Summary: This paper covers mobile apps for connecting farmers to markets and crop forecasting, aligning with your app's functionalities for market and crop sale.

• **Singh, D. A., & Kumar, A. (2022). Machine learning and data analytics in precision agriculture. *IEEE Transactions on AI*.** Summary: This paper focuses on the use of machine learning for crop yield predictions, relevant to your app's feature for technology-enhanced farming practices.


Thank
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