Team Details

a. **Team name: Supacode**

b. **Team leader name: Krishna Goswami**

c. **Problem Statement: Leveraging Earth Observation Data for Informed Agricultural Decision-Making**

BRIEF ABOUT THE IDEA

Implementation of a Web-based application for farmers to empower them with insights on water availability, soil moisture, crop health and other farming insights.

- Using **Prophet** for **prediction of water requirement and scenarios such as droughts or floods** in future.
- This platform integrates satellite datasets, machine learning models for predictions and visualization tools to make data actionable.
- Apart from this, the **friendly UI** of the application would make it easy for farmers to navigate through their needs and gain information from the WebApp.
- Utilizes **Convolution Neural Networks (CNN) for crop disease prediction** in order to provide support to farmers against bad crop.

OPPORTUNITIES

UNIQUE SELLING PROPOSITION :

- Based on current weather, soil moisture, and evapotranspiration data, the tool can provide **intelligent irrigation scheduling** hence optimise water use.
- Using **NASA's GRACE** data to monitor **groundwater levels and predict drought or flood** risk in the farmer's region.
- A User friendly **AI bot** to efficiently assist farmers and to resolve agriculture related queries.
- **Pesticide Suggestion** and **Crop disease Prediction** for effective analysis of Crop.
- **Historical yield analysis and tracking** for better output.

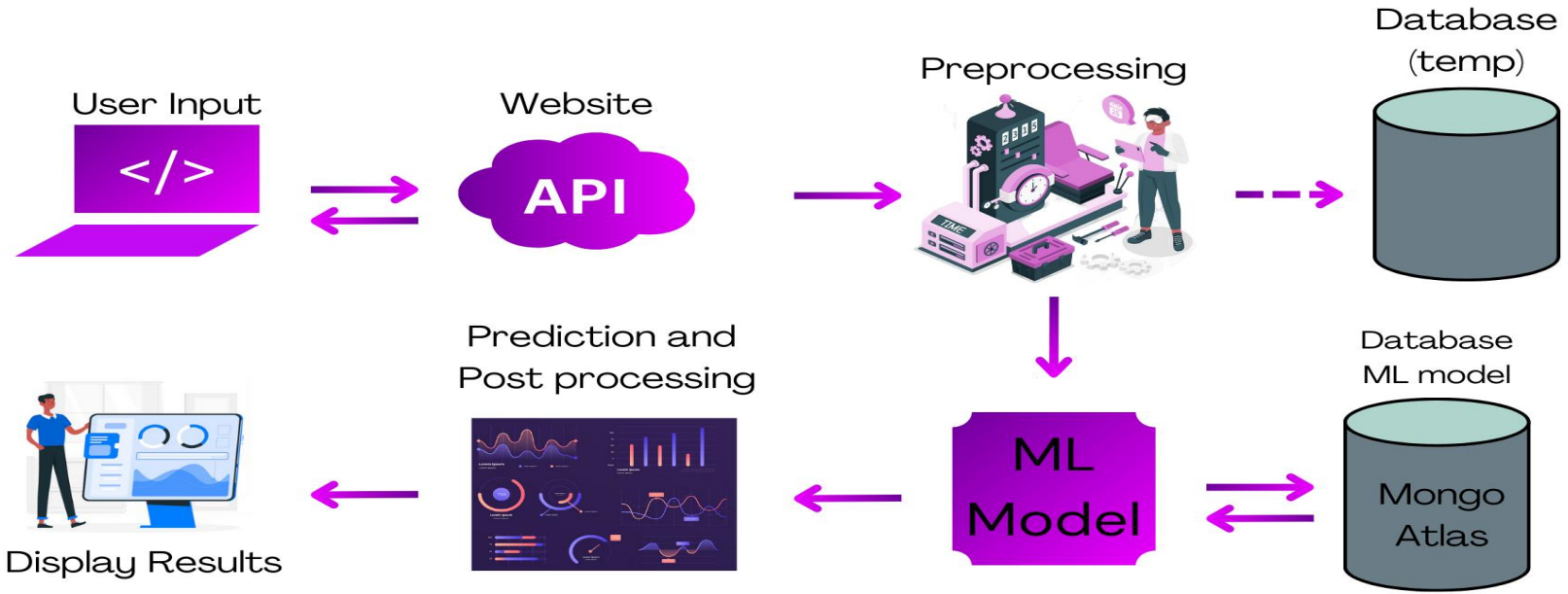
IDEA RESOLUTION :

- Helps farmers to know about **current water storage** and **future water availability** to plan their crops cultivation and harvesting accordingly.
- Takes into account **extreme scenarios such as droughts and floods** and issues **early alerts** to farmers.
- Early prediction of crop diseases can help prevent crop losses ensuring **stable food production**.
- Through advanced data analysis of **crop growth patterns** farmers can maximise their yield for the season and **promote sustainable water usage**.
- **Instant news** and **Schemes** for farmers available in one click.

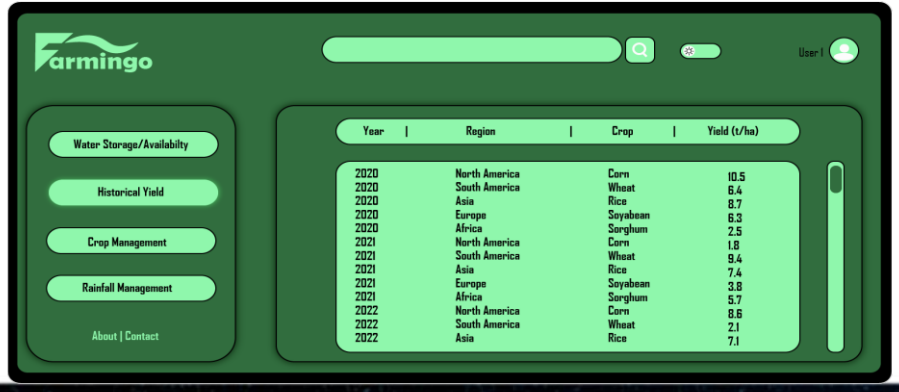
LIST OF FEATURES OFFERED BY THE SOLUTION

- **Crop water demand analysis** using plant factor index and Prophet model.
- Helps in **prediction of future water availability** in the area owing to factors such as groundwater, weather changes, area of agriculture land and population.
- Considering **extreme scenarios** and **plant factor index** for mitigating conditions such as droughts or floods in the area.
- **Monitoring crop health** and **issue alerts** and notifications to farmers in case of any discrepancy related to soil moisture, pests or diseases.
- **Historical yield analysis and tracking** to improve overall output and profits of farmers.
- **AI chatbot** for daily or uncommon agriculture related queries.
- Effective **Pesticide Suggestions** according to the crop for minimum crop damage

PROCESS FLOW DIAGRAM OR USE-CASE DIAGRAM

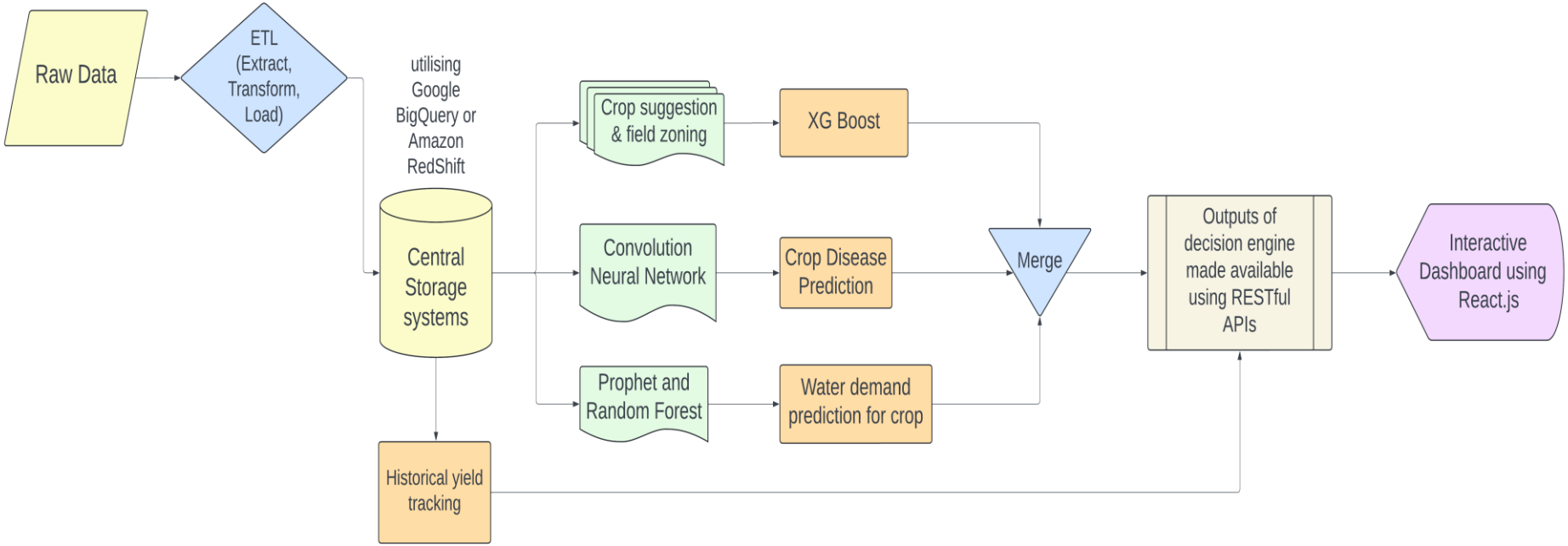


WIREFRAMES/MOCK DIAGRAMS OF THE PROPOSED SOLUTION

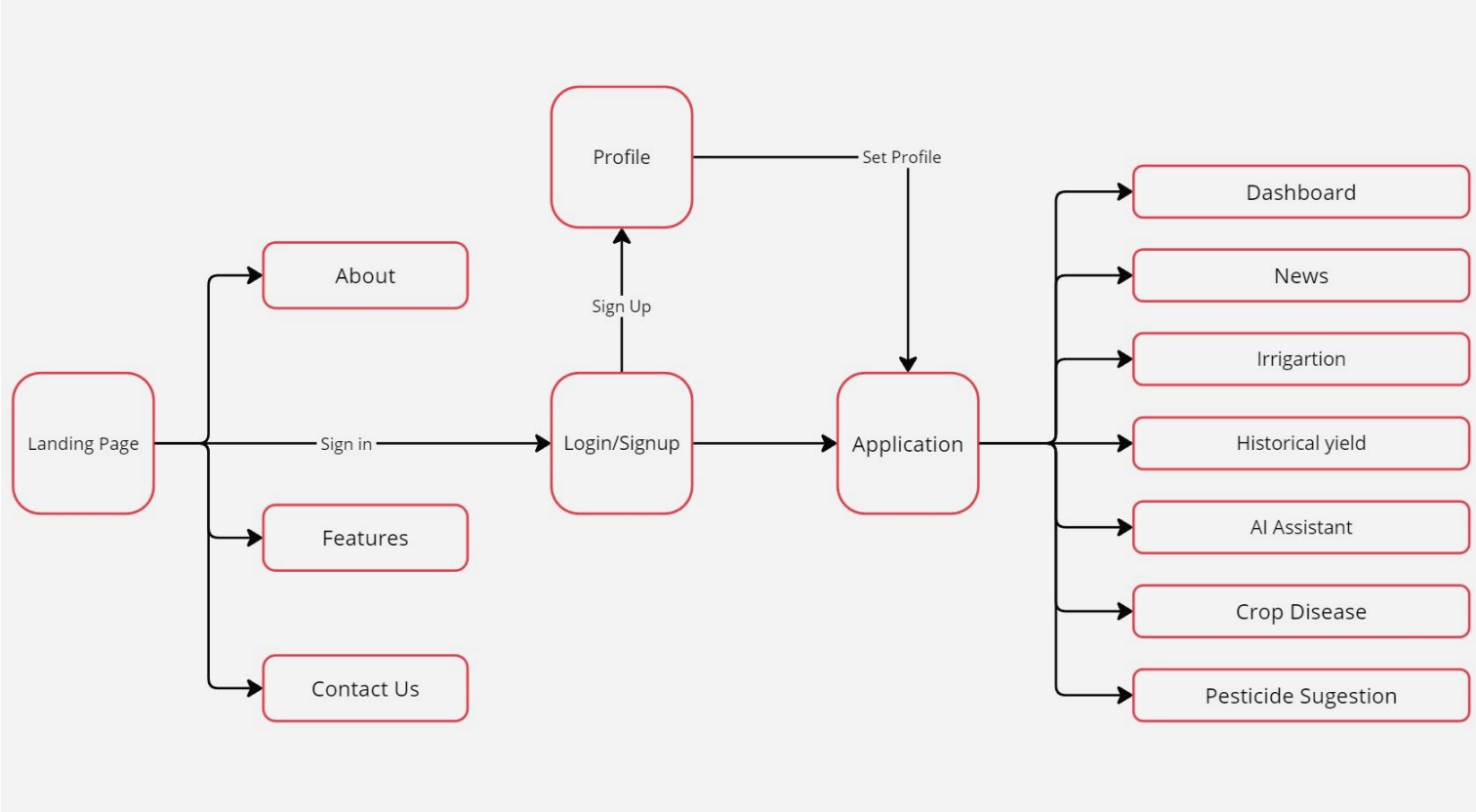


Link to Wireframes:
https://shorturl.at/eRwdJ

ARCHITECTURE DIAGRAM OF THE PROPOSED SOLUTION



UI Flow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Dashboard
About
Sign Up
News
Irrigartion
Landing Page
Sign in
Login/Signup
Application
Historical yield
Features
AI Assistant
Crop Disease
Contact Us
Pesticide Sugestion

TECHNOLOGIES TO BE USED IN THE SOLUTION

FUNCTIONALITY	TECHNOLOGY USED
Machine Learning Model	Crop Disease Prediction: Convolution Neural Networks Water Demand Prediction: Prophet, Random Forest
Database Management & Querying	MongoAtlas, FireStore, Google Big Query, Google Cloud
Front End Web Application	React.JS, TailWind CSS, Leaflet, GSAP – Provide an interactive interface.
Back End Web Application	NodeJS, Express, Django, Fast API, Celery

ADDITIONAL DETAILS/FUTURE DEVELOPMENT (IF ANY)

- **Real-time water usage tracking** and suggestions for irrigation schedules based on weather forecasts, soil moisture, and evapotranspiration data.
- **Profitability projections** that allow farmers to understand the financial impact of their seeding, irrigation, and crop management decisions.
- **Integration with farm machinery**: Track equipment performance and suggest maintenance schedules to reduce downtime and improve efficiency.
- **Field Zoning** and **Seed Suggestion** according to various factors such as moisture, landscape and weather

1. **GITHUB PUBLIC REPOSITORY :**

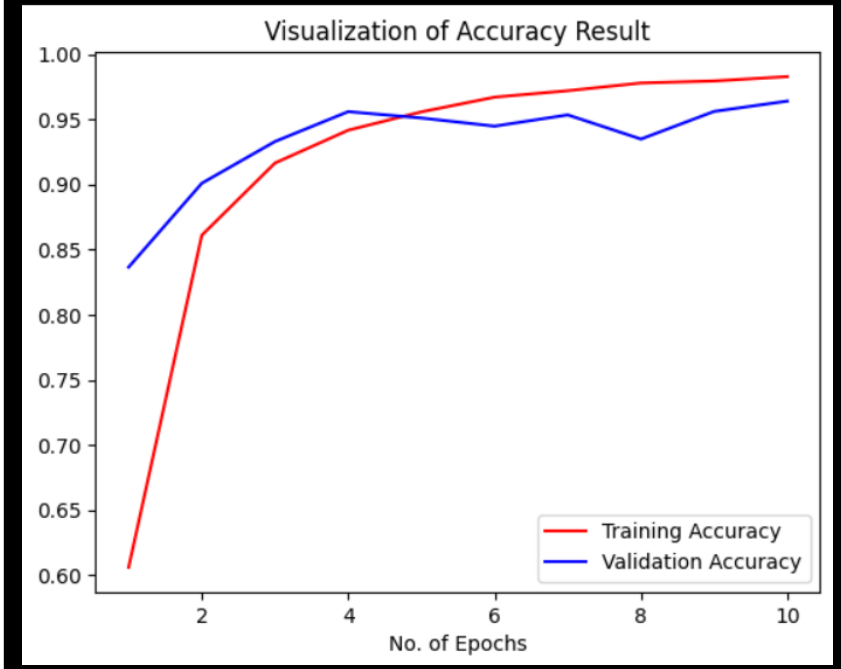
https://github.com/Senpai-489/Farmingo

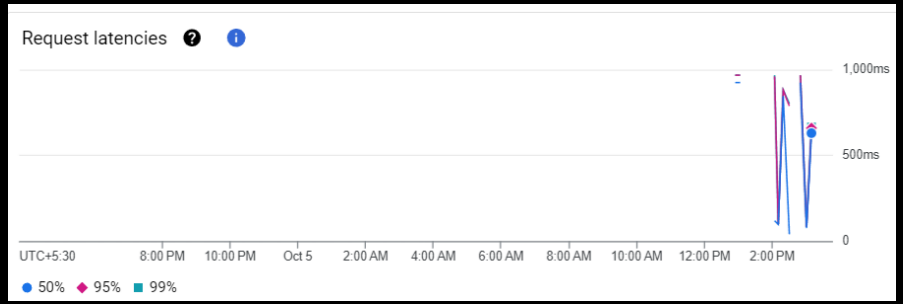
https://github.com/krishnaGauss/Crop-Disease-MLModelAPI.git

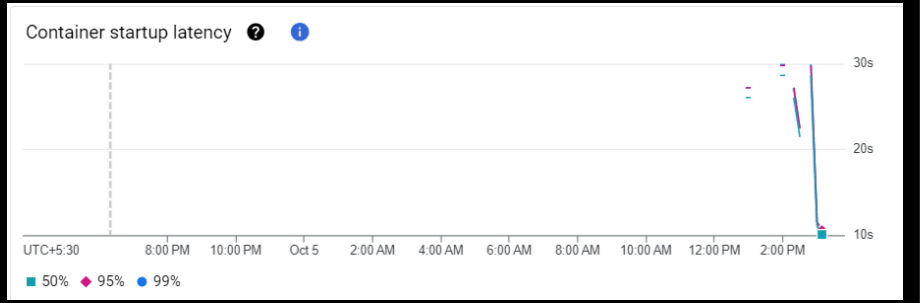
2. **YOUTUBE VIDEO LINK:**

https://youtu.be/2_bHwmZ7ui8

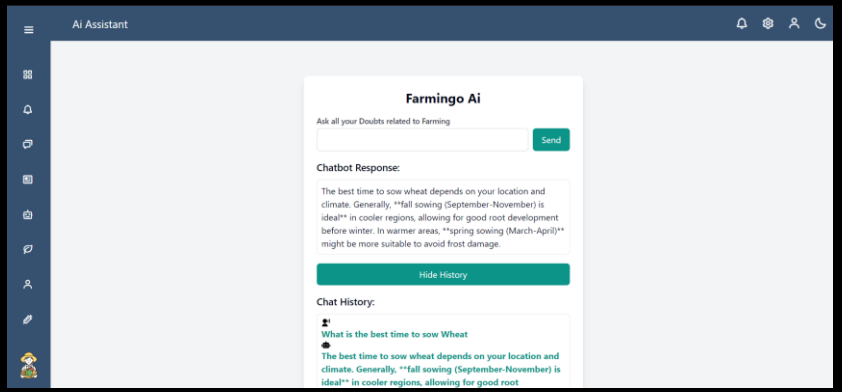
Benchmarks and Performance

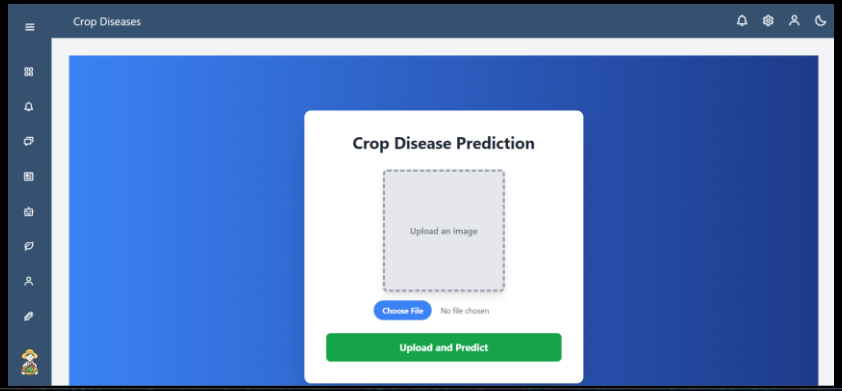


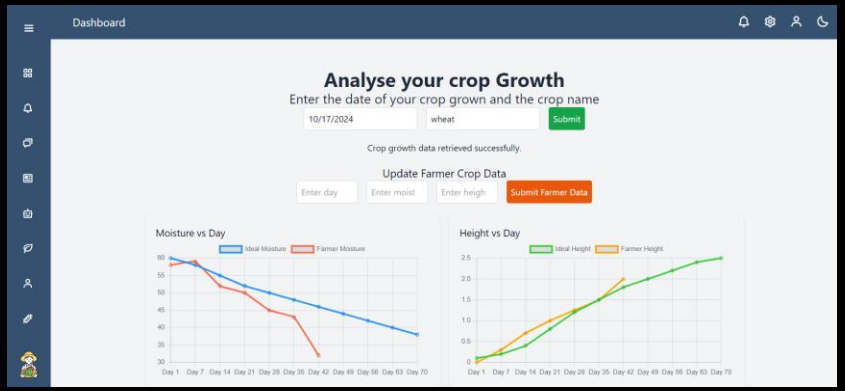




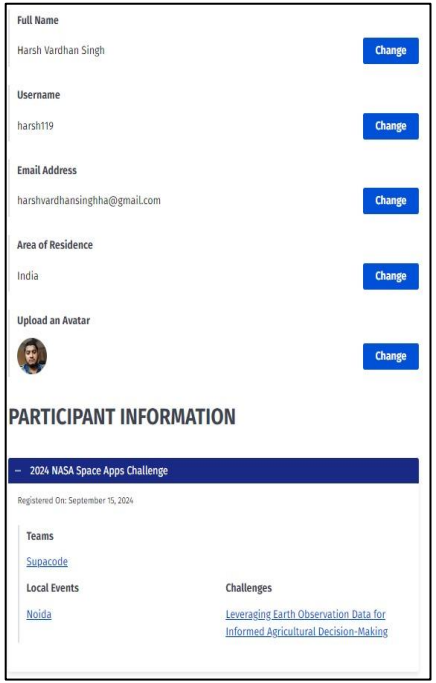
Prototype Sneak Peek







Proof of Registration on https://www.spaceappschallenge.org/nasa-space-apps-2024/2024-local-events/noida



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Challenges
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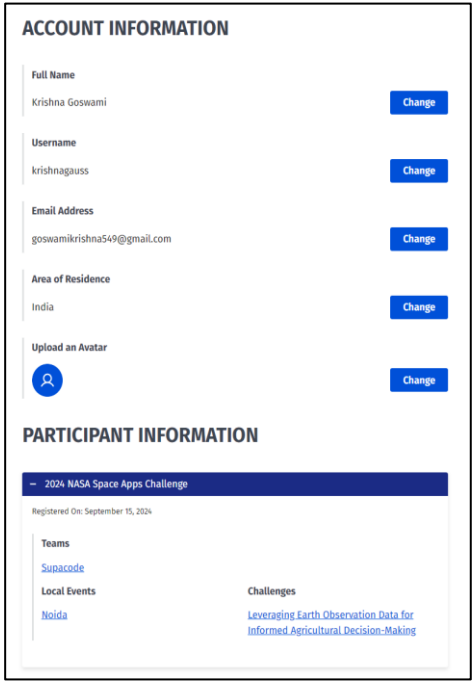

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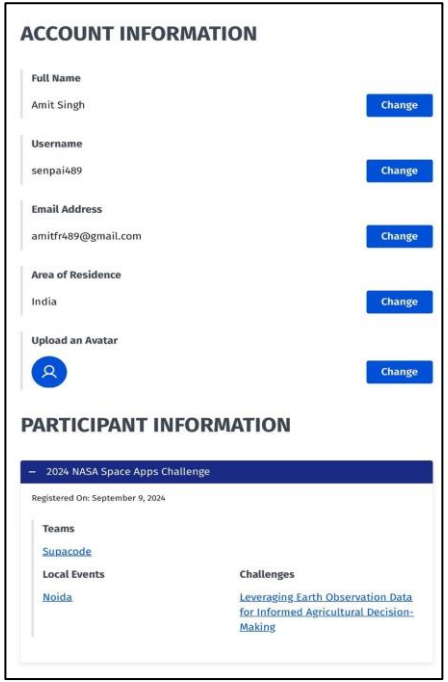

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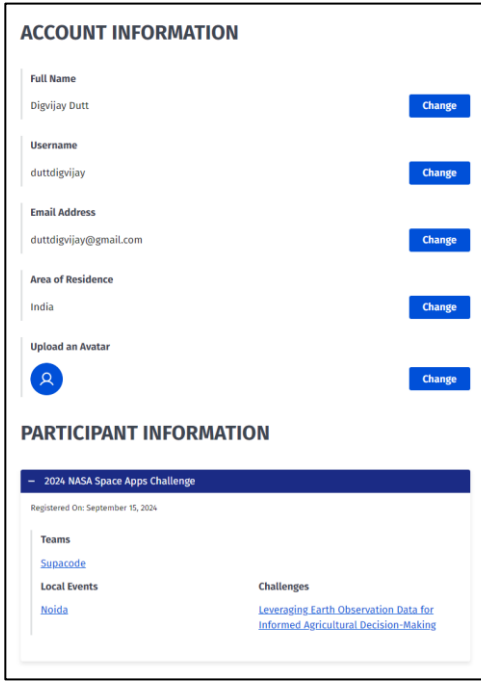

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