SUGGESTED BY SIR

- a platform that connects small farmers who have small yield

- Connects ppl who need fresh, genuine, from the field but less in quantity

- one place(micro mandi) in village to collect vegi

- they can keep it in places or even at home

- the application will work like an aggregator

- collection point where ppl will come and take

- capture info from farmers, giving you service to supply chain ppl and helping vendors purchase things from you

- try to reduce food mile

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2 farmlands
greenhouse and open
Land is prepared.
Land preparation -> iot
To tell which crop can be grown here for high-yield
Showed a couple and you started seeding
Microgreens -> drones for seeding
It is not about the area it's about how we doing it
Water management by iot, how much moisture, water, and nutrition needed
If needed minimum organic elements need to be sprayed then dthe rone
All these are controlled by iot-> remotely
All this info available on the web and app
Where am I getting it from? -> blockchain
Online payment-> security needed
In the long run, how much microgreens are needed by certain companies can be predicted by ML

- Iot
- Mobile dev
- Web dev
- Security
- Ml
- DevOps MLops

Literature survey-> compile what others have done all across the globe.

Micro Mandi Platform for Small Farmers and Local Consumers

1. Introduction

The Micro Mandi platform aims to bridge the gap between small-scale farmers with limited yields and consumers who need fresh, genuine, and small quantities of farm produce. The platform will act as an aggregator, creating a centralized collection point (micro mandi) in villages where farmers can deposit their produce. Consumers and vendors can then purchase directly from these collection points, reducing food miles and ensuring fresh produce reaches the end user.

2. Objectives

- Connect small farmers with consumers and vendors.
- Provide a centralized collection point (micro mandi) for farmers to deposit their produce.
- Enable consumers to access fresh, locally sourced produce in small quantities.
- Reduce food miles by optimizing the supply chain.
- Capture and manage farmer, vendor, and consumer data to streamline operations.

3. Scope

The platform will:

- Allow farmers to register and provide details about their produce.
- Enable consumers and vendors to browse and purchase produce from the micro mandi.
- Provide a logistics framework for collection and distribution.
- Track and reduce food miles by optimizing supply chain routes.
- Offer a user-friendly mobile and web application for all stakeholders.

4. Functional Requirements

4.1 User Roles

1. Farmers:

- Register and log in to the platform.
- Add details about their produce (type, quantity, location, etc.).
- Deposit produce at the micro mandi.
- Receive payment for their produce.

2. Consumers:

- Register and log in to the platform.
- Browse available produce at the micro mandi.
- Place orders for small quantities of produce.
- Pick up produce from the micro mandi or request delivery.

3. Vendors:

- Register and log in to the platform.
- Browse and purchase bulk quantities of produce from the micro mandi.
- Arrange for logistics and transportation.

4. Admin:
- Manage user accounts (farmers, consumers, vendors).
- Monitor and optimize supply chain operations.
- Generate reports on produce availability, sales, and food miles.

4.2 Core Features
1. Farmer Onboarding:
- Capture farmer details (name, location, contact info, produce type, yield).
- Provide a dashboard for farmers to track their sales and payments.

2. Produce Listing:
- Farmers can list their produce with details (type, quantity, price, location).
- Consumers and vendors can filter and search for specific produce.

3. Micro Mandi Management:
- Centralized collection point for farmers to deposit produce.
- Inventory management system to track available produce.

4. Order Management:
- Consumers and vendors can place orders through the platform.
- Payment integration for seamless transactions.

5. Logistics and Delivery:
- Optimize routes for collection and distribution to reduce food miles.
- Provide tracking for deliveries (if applicable).

6. Reporting and Analytics:
- Track food miles and carbon footprint reduction.
- Generate sales and inventory reports for farmers and vendors.

5. Non-Functional Requirements
1. Scalability: The platform should handle an increasing number of users and transactions.
2. Performance: The system should respond within 2 seconds for most operations.
3. Security: Secure user data and transactions using encryption and authentication.
4. Usability: The platform should be user-friendly, with intuitive interfaces for farmers, consumers, and vendors.
5. Availability: The platform should have 99.9% uptime.

6. Challenges

1. Farmer Adoption: Convincing small farmers to adopt the platform and use technology.
2. Logistics: Managing the collection and distribution of produce in rural areas.
3. Food Miles Optimization: Calculating and optimizing routes to minimise food miles.
4. Inventory Management: Ensuring accurate tracking of produce at the micro mandi.
5. Payment Integration: Providing secure and accessible payment options for all users.
6. Data Accuracy: Ensuring accurate and up-to-date information from farmers and vendors.

7. Algorithms and Methods

7.1 Algorithms

1. Route Optimization Algorithm:
- Use algorithms like Dijkstra's or A* to optimize logistics routes and reduce food miles.
- Incorporate real-time traffic and road conditions for dynamic routing.

2. Matching Algorithm:
- Match farmers' produce with consumer and vendor demand using a recommendation system.
- Use collaborative filtering or content-based filtering for personalized recommendations.

3. Inventory Management Algorithm:
- Use FIFO (First In, First Out) or LIFO (Last In, First Out) methods to manage produce at the micro mandi.

4. Pricing Algorithm:
- Dynamic pricing based on demand, supply, and seasonality.

7.2 Methods/Processes

1. Farmer Onboarding Process:
- Conduct workshops and training sessions to onboard farmers.
- Provide multilingual support for ease of use.

2. Data Collection and Management:
- Use mobile apps and IoT devices to capture real-time data from farmers.
- Store data in a centralized database for easy access and analysis.

3. Logistics Management:
- Partner with local logistics providers for efficient collection and distribution.
- Use GPS tracking for real-time monitoring of deliveries.

4. Food Mile Tracking:
- Calculate food miles using GPS data and optimize routes to minimize them.
- Provide reports on carbon footprint reduction.

8. System Architecture

1. Frontend:
- Mobile and web applications for farmers, consumers, and vendors.
- Built using React Native (mobile) and React.js (web).

2. Backend:
- API for handling user requests and data processing.

3. Database:
- Used for relational data (user info, produce details, orders) and unstructured data (logs, analytics). (need suggestion which to use)(mongo,prostgre or any other)

4. Cloud Infrastructure:
- Host the platform on AWS or Google Cloud for scalability and reliability.

9. Future Enhancements

1. AI-Powered Demand Forecasting: Predict demand for specific produce to help farmers plan their yields.
2. Blockchain for Transparency: Use blockchain to track the supply chain and ensure transparency.
3. IoT Integration: Use IoT sensors to monitor produce quality and storage conditions.
4. Expansion to Other Regions: Scale the platform to other villages and regions.