PROJECT REPORT ON

" AgroEasy"

Submitted

in part of Design thinking and Idea Lab

B. Tech in

Artificial intelligence and Data Science

By

Team No. : 06

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**SANJIVANI**
UNIVERSITY

# Content

# 1. Introduction

## 1.1 Why I Chose This Project

As I grew up in a rural community, I witnessed firsthand the struggles farmers faced in ensuring a healthy harvest. My grandfather, a seasoned farmer, would often share stories of crop failures due to disease outbreaks and inefficient farming practices. His experiences sparked my interest in finding innovative solutions to these challenges.

Background

Agriculture is the backbone of many economies, providing livelihoods for millions.

However, farmers face numerous challenges:

1. Crop diseases.

2.Rentals

3. Climate change and weather variability

Theory of Design Thinking

Design thinking is a human-centered approach to problem-solving (Brown, 2009).

It empathizes with users, defines problems, ideate solutions, prototypes, and tests.

Key principles:

1. Empathy: Understand users' needs and pain points.
2. Co-creation: Collaborate with stakeholders.
3. Experimentation: Test and refine solutions.
4. Holistic thinking: Consider entire systems.

These solutions inspired my project, focusing on:

1. Integrated disease detection and management ,weather ,Rentals ,buying selling process.
2. Personalized farming recommendations.
3. Accessible, user-friendly interface.

By combining design thinking principles with insights from literature, I aim to create an agricultural application that addresses the complex needs of small-scale farmer

## 2. Problem Statement :

Now a days farmers are dealing with buying and selling products , rentals ,crop disease detection.

### 2.1   Objective:

Develop an integrated agricultural platform that utilizes disease detection, enables seamless renting and buying/selling processes, and enhances farmers' decision making capabilities.

**2.2   Goals:**  Disease Detection Module:

1. Identify and classify crop diseases using image recognition and machine learning algorithms.
   1. Provide accurate disease diagnosis with >90% accuracy

Offer personalized recommendations for disease management and treatment.

Renting and Buying/Selling Module:

1. Create a user-friendly platform for farmers to rent equipment, tools, and services.
2. Facilitate buying and selling of agricultural products, seeds, and inputs.
3. Ensure secure transactions and payment processing.

## 3. Secondary Research

Research  suggests that apps providing information on pesticide use can help farmers apply the right products at the right time, reducing waste and environmental impact. App that track pesticide usage and suggest eco-friendly alternatives are gaining traction in sustainable agriculture.

Research indicates that app integrated with drip irrigation systems can monitor water usage and soil moisture levels, leading to water conservation and improved irrigation efficiency. Real-time data helps farmers optimize irrigation schedules, reducing water wastage. Research highlights the growing trend of agricultural equipment rental platforms, which offer farmers access to machinery like tractors, plows, and harvesters without the high upfront cost. Apps that facilitate rental services improve access to essential equipment, especially for small-scale farmers. While these features offer great potential, research emphasizes the need for simple, user-friendly interfaces and multilingual support, especially for farmers in rural areas. Overcoming barriers like digital literacy and internet connectivity is crucial for widespread adoption.

## 4. Primary Research

Conduct surveys with farmers to understand their needs, pain points, and current practices. By conducting primary research using these methods, you can gather valuable insights and data to inform the development of your agricultural application.
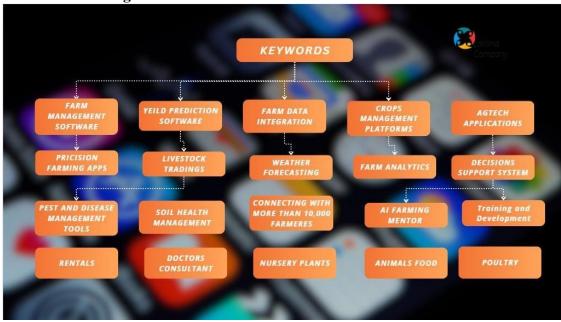
## 5. Analysis

Need for User-Friendly Applications: Both primary and secondary research highlighted the need for user-friendly and specialized mobile applications for agriculture.
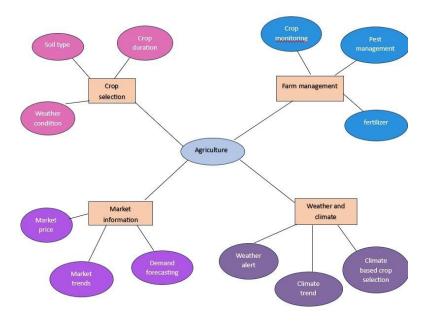
## 6. Redifining Problem

Farmers, especially in rural areas, need an easy-to-use app that brings together essential services like pesticide management, plant tracking, irrigation control, poultry care, and equipment rentals.
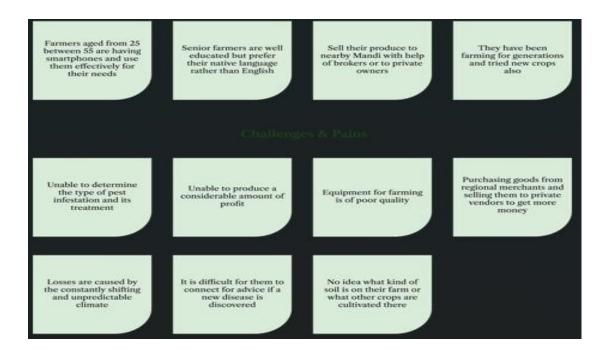
## 7. Idealization
### 7.1    Brainstorming



### 7.2    Mind Mapping:

## 7.3    Affinity Mapping:



## 7.4    5W-1H Activity

| Aspect | Questions | Details |
|---|---|---|
| Who | Who are the stakeholders? | 1.Farmers |
| | | 2.Group Members |
| | | |
| | | |
| What | What is the problem? | How Farmer can deal with climate , soil erosion , biodiversity loss , consumer expectations , and rising demand for higher quality food |
| | | |
| | | |
| | What is the solution? | For better future for farmer , to reduce farm stress and promote successful farming with optimal income, the bold vision team has developed the farmer's helping hand application. These app can detect crop disease , measure soil pH, provide weather forecasting and more |
| | What are the key features? | 1. Automated Monitoring and Diagnosis |
| | | 2. smart irrigation system |
| | | 3.costomised recommendation |
| | | 4. Automated disease and pest Detection |
| | | 5. detecting crop disease |
| Where | Where will the system be used? | An agricultural application with AI features can be used in various contexts within the agricultural industry |
| | Where will the solution be developed and tested? | SANJIVANI UNIVERSIITY |
| When | When is the device needed? | This application wil be needed at the various stages and situations at farming including planting seasons, growing period of crop, resource management, weather changes, , etc. |
| | When should the project be completed? | Thid feature can bring numerous benefits and address critical challenges in modern farming, like early problem detection , adaptation to climate change, etc. |
| Why | Why is this project important? | This project is important for several reasons like addressing food security, economic benefits, resource management, etc. |
| | Why will the users adopt this solution? | For enhanced productivity, cost efficiency, early problem detection and it's solution, ease to use, competitive advantage and many more |
| How | How will the system work? | This involves usings GPS, sensors and data analytics to monitor and manage field variability in crops. Sensors collect data on soil moisture , nutrient levels , and crop |

## 7.5 **Scam**per Tool

| scamper element | Question to consider | students response |
|---|---|---|
| Substitute | How can we substitute? | • use application instead of manual PH testing<br>• use images recognition for diseases identification<br>• Use blockchain technology for secure transactions |
| Combine | Can we combine different elements,features or functions? | • Integrate diseases detection with precision irrigation system<br>• Integrate weather forecasting with crop monitoring system<br>• Integrate E commorce platform with farm management software |
| Adapt | Can we adapt of tweak an existing idea for this product or problem? | • Modify existing PH testing mthod for specific crop<br>• Modify existing weather forecasting models for locals microclimate |
| Modify | How can we modify size,shape or functionality? can we make it bigger,smaller or more efficient? | • Develop application for diseases monitoring<br>• Developed mobile app for personalized weather forecaste<br>• Develop mobile app for farmers market transactions |
| Put to another use | Can this product or part of process be used for something else? | • utilized diseases detection algorithms for pest management<br>• Utilize weather forecasting for irrigation optimization<br>• Utilize online plateforms for agricultural education |
| Eliminate | What can we remove or simplify to improve the product? | • Remove manual diseases inpection errors<br>• remove intermediares in agricultural suply chain<br>• Remove weather related crop damage |
| reverse | can we reverse or change the order of process materials, functions? | • Implement protective diseases prevention measures<br>• Implement climate resilient agricultural practices<br>• Implement customer centric agricultural marketing |

## 7.6 **Three Laws of Design Thinking**

1. Empathy

Empathy is about understanding the needs, emotions, and motivations of the users.
This involves observing, engaging, and immersing oneself in the users' experiences

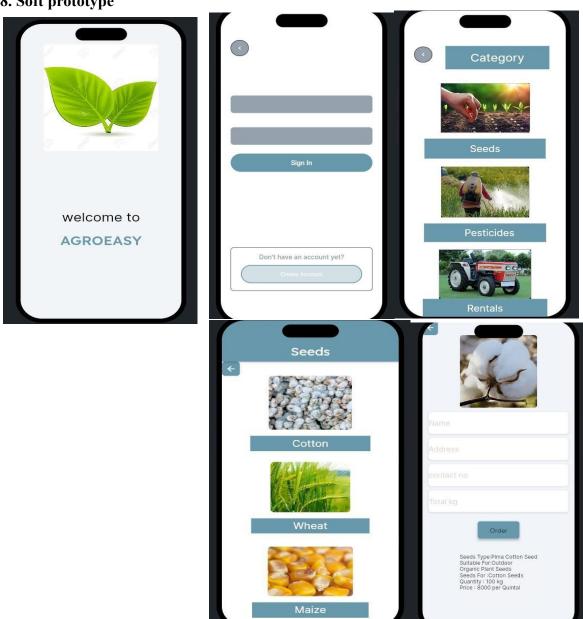to gain a deep understanding of their problems and needs.

2.Ideation

Generate a wide range of ideas and solutions to the problem or opportunity statement. This involves brainstorming, mind mapping, and other creative techniques to generate as many ideas as possible**.**
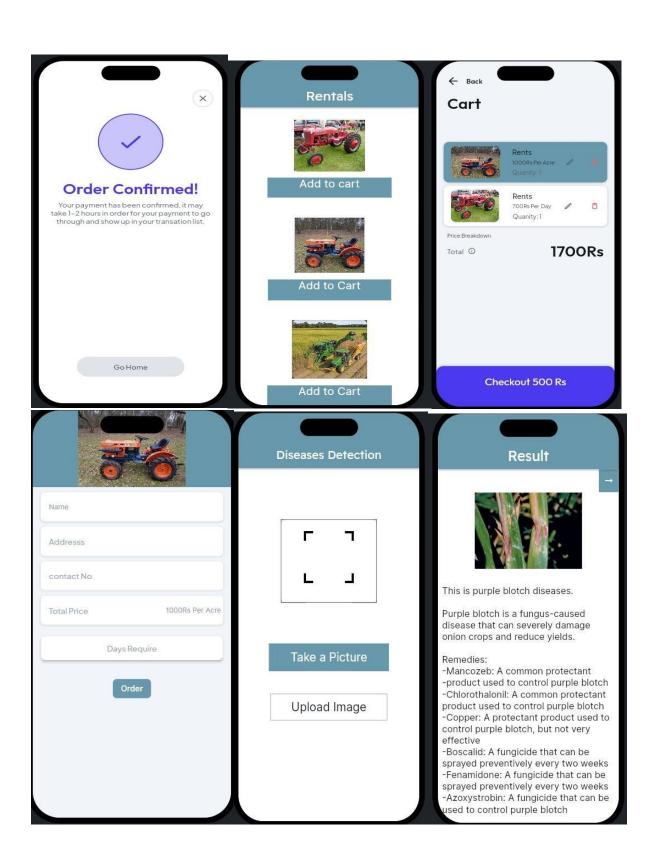
3.Prototyping and Testing
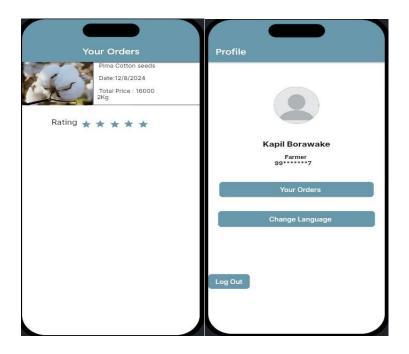
This stage involves creating simple, scaled-down versions of the product or solution (prototypes) and testing them with users. Prototyping allows for the exploration of ideas, and testing provides feedback that can be used to refine and improve the solution. This stage is iterative, meaning it often cycles back to earlier stages as new insights and ideas emerge.

These principles form the backbone of the design thinking process, fostering a usercentered approach to problem-solving.

## 8. Soft prototype



welcome to
**AGROEASY**



Sign In

Don't have an account yet?
Create Account



**Category**

Seeds

Pesticides

Rentals



**Seeds**

Cotton

Wheat

Maize



Name
Address
contact no
Total kg

Order

Seeds Type:Pima Cotton Seed
Suitable For:Outdoor
Organic Plant Seeds
Seeds For :Cotton Seeds
Quantity : 100 kg
Price : 8000 per Quintal

**Order Confirmed!**

Your payment has been confirmed, it may take 1–2 hours in order for your payment to go through and show up in your transation list.

Go Home

## Rentals

Add to cart

Add to Cart

Add to Cart

## Cart

Back

Rents
1000Rs Per Acre
Quanity: 1

Rents
700Rs Per Day
Quanity: 1

Price Breakdown

Total ⓘ                    **1700Rs**

Checkout 500 Rs

---

Name

Addresss

contact No

Total Price            1000Rs Per Acre

Days Require

Order

## Diseases Detection

Take a Picture

Upload Image

## Result

→

This is purple blotch diseases.

Purple blotch is a fungus-caused disease that can severely damage onion crops and reduce yields.

Remedies:
-Mancozeb: A common protectant
-product used to control purple blotch
-Chlorothalonil: A common protectant product used to control purple blotch
-Copper: A protectant product used to control purple blotch, but not very effective
-Boscalid: A fungicide that can be sprayed preventively every two weeks
-Fenamidone: A fungicide that can be sprayed preventively every two weeks
-Azoxystrobin: A fungicide that can be used to control purple blotch
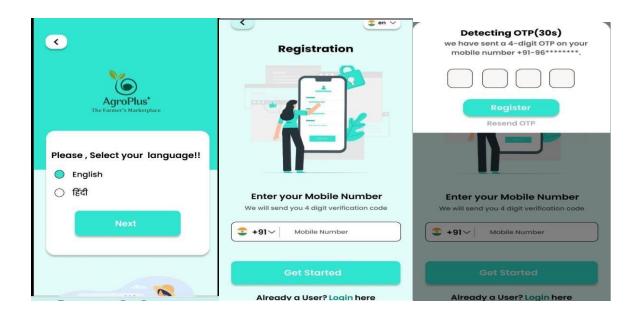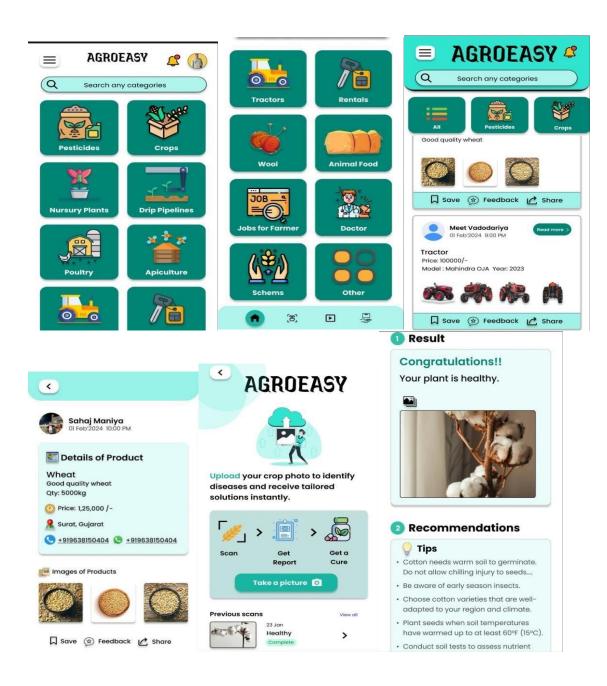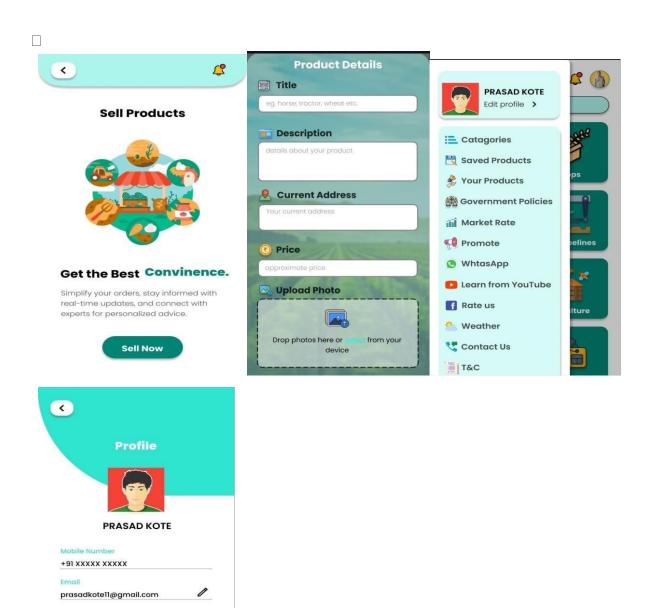
## 8.1 Final Prototype

This is hard copy of our application . our application is same as this prototype

☐
## 9. Usability Studies

1.      User Interviews: Conduct in-depth interviews with farmers, agricultural experts, and other stakeholders to understand their needs, pain points, and expectations from the application.

2.      Heuristic Evaluation: Conduct a heuristic evaluation of the application to identify usability issues and areas for improvement.

3.      User Testing: Conduct user testing with farmers and agricultural experts to observe how they interact with the application, identify usability issues, and gather feedback.

## 10. Final Design Concept

User-Friendly Interface
  Simple and easy-to-navigate interface to cater to farmers with varying levels of digital literacy.
  Multilingual Support: Provide language options to support diverse user bases, especially in rural areas.
 Core Features

Pesticide Use Management:  Provide information on the correct pesticide
                usage.
        o       Suggest eco-friendly alternatives.
Irrigation System Integration:   Monitor water usage and soil
                moisture levels.
        o       Offer real-time data to optimize irrigation schedules.
Equipment Rental Platform:Facilitate access to machinery like tractors, plows, and
                harvesters.  o Include a booking system to improve access and availability
                for small-
                scale farmers.

## 11. Future Goals
Precision Farming:
  -     Increase crop yield through data-driven decisions.
  -     Implement AI and IoT for real-time monitoring of soil health, weather, and crop growth.

2. Automation & Robotics

- Develop drones for crop monitoring, pest detection, and field mapping.

3.. Collaborate with research institutions for disease detection advancements  4.
Develop tools for water conservation.

□
## 12. References

- • • A report from **Grand View Research** titled "Agricultural Equipment Rental Market Size, Share & Trends Analysis Report by Type (Tractors, Harvesters, Others), by Application (Farmland, Greenhouse, Others), and Segment Forecasts, 2023-2030" provides insights into this market.

- • • **Agricultural Business Studies** (e.g., research papers published in journals like *Agricultural Systems* or *Field Crops Research*) often explore the financial and operational feasibility of rental systems.

## 13. Acknowledge

I sincerely thank Kiran Wakchaure sir and Tanay Ghosh sir for their guidance and support throughtout this project . I also appreciate the assistance provided by Sanjivani University and the Encouragement from team mates. Your contributions were invaluable to the success of this work

Images and Visuals

For your report, add images and visuals in the following sections:

- **Prototyping (Soft and Hard Prototypes):** Insert wireframes and screenshots of the app.
- **Usability Studies/User Feedback:** Include charts or graphs summarizing user feedback.
- **Ideation and SCAMPER:** Include a mind map or flowchart showing the ideation process.

You can use tools like **Figma** or **Canva** to create these visuals and then insert them into your report. Ensure that each image has a caption explaining what it represents.