

**AGRIMAN: AGRICULTURAL MANAGEMENT SYSTEM
APPLICATION**

BY

**Sabid Ahmed Sunve
ID: 201-15-14075**

AND

**Partha Pratim Mallick
ID: 201-15-14086**

FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

Md. Abbas Ali Khan
Assistant Professor
Department of Computer Science and Engineering
Daffodil International University

Co-Supervised By

Ms. Sharmin Akter
Lecturer (Sr. Scale)
Department of Computer Science and Engineering
Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY
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APPROVAL

This Project titled “AgriMan: Agricultural Management System Application”, submitted by **Sabid Ahmed Sunve, ID: 201-15-14075** and **Partha Pratim Mallick, ID: 201-15- 14086** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **15-07-2024**.

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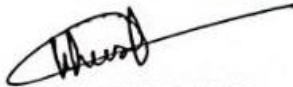
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Daffodil International University

Board Chairman



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Sr. Lecturer
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner 1



Ms. Sharun Akter Khushbu (SAK)
Sr. Lecturer
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner 2



Dr. Ahmed Wasif Reza (DWR)
Professor
Department of CSE
East West University

External Examiner

DECLARATION

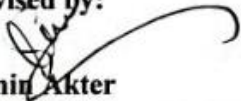
We hereby declare that this project has been done by us under the supervision of **Md. Abbas Ali Khan**, Assistant Professor, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

Supervised by:



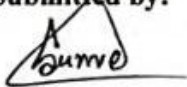
Md. Abbas Ali Khan
Assistant Professor
Department of CSE
Daffodil International University

Co-Supervised by:

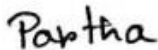


Ms. Sharmin Akter
Lecturer (Sr. Scale)
Department of CSE
Daffodil International University

Submitted by:



Sabid Ahmed Sunve
ID: -201-15-14075
Department of CSE
Daffodil International University



Partha Pratim Mallick
ID: -201-15-14086
Department of CSE
Daffodil International University

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ABSTRACT

The advent of technology has revolutionized various industries, and agriculture is no exception. In the realm of agricultural innovation, our Android application, named 'AgriMan,' stands as a pioneering Agricultural Management System designed to empower and assist farmers in their day-to-day activities. With a commitment to enhancing agricultural practices through technology, AgriMan boasts a user-friendly interface, ensuring accessibility and ease of understanding for farmers of diverse backgrounds. The core objective of AgriMan is to provide a comprehensive suite of features aimed at addressing the multifaceted challenges faced by farmers. One of its key functionalities is the integration of real-time weather forecasts, allowing farmers to make informed decisions regarding their crops based on current and upcoming weather conditions. This feature acts as a vital tool for effective crop planning and risk mitigation. Moreover, AgriMan facilitates access to the ongoing market prices of various crops, empowering farmers with up-to-date information crucial for making informed selling and purchasing decisions. The platform also serves as a dynamic marketplace, bridging the gap between buyers and sellers within the agricultural community. This not only streamlines the selling process for farmers but also ensures fair market practices. A unique aspect of AgriMan is its inclusive community feature, providing a virtual space for individuals to share thoughts, insights, and experiences related to agriculture. This communal platform fosters knowledge exchange and collaboration, allowing farmers to learn from one another, discuss best practices, and collectively contribute to the advancement of agricultural techniques. AgriMan represents a holistic approach to agricultural management, leveraging technology to empower farmers with critical information and fostering a sense of community within the agricultural sector. By amalgamating weather forecasts, market insights, and a collaborative community, AgriMan strives to propel agriculture into a new era of efficiency and sustainability. This project aligns with the vision of harnessing technology for the betterment of agriculture and, consequently, the livelihoods of those who drive this vital industry.

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LIST OF ACRONYMS

API	Application Programming Interface
XML	Extensible Markup Language
MVP	Model View Presenter

CHAPTER 1

INTRODUCTION

1.1 Overview

In the realm of modern agriculture, the Agricultural Management System 'AgriMan' emerges as a technological cornerstone, revolutionizing the way farmers engage with and manage their agricultural practices. Developed as an Android application, AgriMan is strategically designed to be a farmer-centric solution, placing technology at the forefront of agricultural management. The overarching goal of AgriMan is to bridge the gap between traditional farming methods and contemporary technological advancements, offering a user-friendly interface that empowers farmers with intuitive tools and features. This commitment to accessibility ensures that farmers with varying technological expertise can effortlessly navigate the application. AgriMan empowers decision-making through real-time weather forecasts and market analysis, aiding farmers in making informed choices about crop management and transactions. The application not only facilitates buying and selling but also fosters a community where diverse voices contribute to a shared pool of agricultural knowledge. In essence, AgriMan envisions a future where farmers, equipped with accessible technology, navigate farming complexities with efficiency and communal support, marking a progressive leap in the agricultural landscape.

1.2 Background and Present State

Agriculture has been the backbone of human civilization, serving as the primary source of food, fiber, and fuel for centuries. Traditionally, farming practices relied heavily on manual labor, experiential knowledge, and rudimentary tools. However, with the advent of the Industrial Revolution and subsequent technological advancements, agriculture has gradually evolved. Mechanization, chemical fertilizers, and improved irrigation techniques have significantly enhanced productivity and efficiency. Despite these advances, many farmers still rely on traditional methods, which can be labor-intensive and less efficient in the face of modern agricultural challenges.

Today, the agricultural sector is at the cusp of a digital transformation, driven by innovations in information technology, data analytics, and mobile applications. The integration of technology in agriculture, often referred to as "smart farming" or "precision agriculture," is reshaping the landscape by introducing tools that offer unprecedented insights and automation capabilities. However, the adoption of these technologies is not uniform across the globe. In many regions, especially in developing countries, farmers face challenges such as limited access to modern equipment, lack of technological literacy, and inadequate infrastructure. This digital divide hampers the potential benefits that technology can bring to agricultural practices. In this context, the Agricultural Management System 'AgriMan' emerges as a crucial initiative aimed at bridging this gap. Developed as an Android application, AgriMan is designed to be an accessible and user-friendly solution tailored to meet the needs of farmers. By leveraging the widespread availability and familiarity of smartphones, AgriMan seeks to democratize access to advanced agricultural tools and resources. AgriMan offers a comprehensive suite of features, including real-time weather forecasts, market analysis, and a platform for buying and selling agricultural products. These tools empower farmers to make informed decisions, optimize their crop management practices, and engage more effectively in market transactions. Additionally, AgriMan fosters a sense of community among farmers, facilitating the exchange of knowledge and experiences that can drive collective growth and innovation. AgriMan represents a significant step towards modernizing agricultural practices by making advanced technology accessible to farmers of all technological backgrounds. It addresses the current challenges faced by the agricultural sector and paves the way for a more efficient, informed, and connected farming community.

1.3 Problem Statement

Despite the significant advancements in agricultural technology, a considerable number of farmers, especially in developing regions, continue to rely on traditional farming methods. These methods, while time-tested, often lack the efficiency, precision, and adaptability required to address modern agricultural challenges. The primary issues faced by these farmers include:

- ❖ **Limited Access to Technology:** Many farmers do not have access to modern agricultural tools and technologies due to high costs, inadequate infrastructure, and lack of awareness. This technological gap restricts their ability to improve productivity and sustainability.
- ❖ **Inadequate Information and Resources:** Farmers frequently operate without real-time data on weather conditions, soil health, and market trends. This lack of information can lead to suboptimal decision-making, resulting in poor crop yields and financial losses.
- ❖ **Market Inefficiencies:** The agricultural market is often fragmented, with farmers facing difficulties in accessing fair and timely market prices for their produce. This can lead to exploitation by middlemen and reduced profit margins.
- ❖ **Isolation and Knowledge Gaps:** Farmers often work in isolation, lacking platforms for knowledge sharing and community support. This isolation can prevent them from adopting best practices and innovative techniques that could enhance their productivity.
- ❖ **Varying Levels of Technological Literacy:** Even when technology is available, varying levels of technological literacy among farmers can hinder its effective use. User-friendly interfaces and intuitive design are crucial to ensure that technological solutions are accessible to all farmers, regardless of their expertise.

The Agricultural Management System 'AgriMan' aims to address these problems by providing a comprehensive, user-friendly mobile application designed specifically for farmers.

1.4 Objectives

The main goals of this project are:

- ❖ Develop an intuitive and user-friendly agricultural management system application that provides real-time weather forecasts to help farmers plan and protect their crops.
- ❖ Deliver pest control recommendations to minimize crop damage and loss.
- ❖ Implement stringent security measures to safeguard user data, ensuring system integrity and protecting against cyber threats.
- ❖ Promote sustainable farming practices with guidance on soil and water conservation.
- ❖ Equip system administrators with comprehensive tools to manage user accounts, system configurations, and updates efficiently.
- ❖ Empower farmers with knowledge through educational resources and expert advice.
- ❖ Create a community platform for farmers to share experiences and advice.
- ❖ Facilitate access to real-time market prices and trends, helping farmers to make informed selling decisions.
- ❖ Deliver localized, real-time weather updates and alerts to help farmers prepare for adverse weather conditions.

All of these goals work together to provide a solid, user-friendly agricultural management system application platform that meets the demands of consumers, organizers, and system administrators while transforming the effectiveness and ease of trip administration.

1.5 Scope and Limitations

Scope

The Agricultural Management System 'AgriMan' is designed to be a comprehensive, farmer-centric mobile application that addresses various facets of agricultural management. The scope of AgriMan includes:

- ❖ **Real-Time Weather Forecasts:** Providing farmers with accurate and timely weather information to help them make informed decisions regarding planting, irrigation, and harvesting.
- ❖ **Market Analysis:** Offering real-time data on market prices, trends, and demand for various crops, enabling farmers to plan their production and sales strategies effectively.
- ❖ **Buying and Selling Platform:** Creating a digital marketplace where farmers can buy essential inputs like seeds, fertilizers, and equipment, and sell their produce directly to buyers, minimizing reliance on middlemen and improving profit margins.
- ❖ **Community and Knowledge Sharing:** Facilitating a platform for farmers to connect, share experiences, and exchange knowledge about best practices, innovative techniques, and successful farming strategies.
- ❖ **User-Friendly Interface:** Ensuring that the application is easy to navigate and use, catering to farmers with varying levels of technological literacy.

Limitations

While AgriMan aims to provide a robust solution for modern agricultural management, it is essential to acknowledge certain limitations:

- ❖ **Technological Infrastructure:** The effectiveness of AgriMan is contingent on the availability of reliable internet connectivity and smartphone penetration, which may be limited in certain rural areas.

- ❖ **Data Accuracy and Reliability:** The accuracy of weather forecasts, market data, and crop health indicators depends on the quality and timeliness of the data sources. Inaccurate or outdated information could lead to suboptimal decision-making.
- ❖ **Adoption and Training:** The success of AgriMan relies on the willingness of farmers to adopt new technology. Providing adequate training and support to farmers with limited technological experience is crucial but can be resource-intensive.
- ❖ **Regional and Cultural Differences:** Agricultural practices and market dynamics vary widely across different regions and cultures. Customizing the application to suit diverse local needs and preferences may present challenges.
- ❖ **Financial Constraints:** While AgriMan aims to be affordable, some farmers may still face financial barriers in accessing smartphones and internet services required to use the application effectively.
- ❖ **Security and Privacy Concerns:** Protecting the data privacy and security of users is paramount. Any breaches or misuse of data could undermine user trust and the overall credibility of the application.

By recognizing these limitations, the development and implementation of AgriMan can be better tailored to address potential challenges, ensuring that the application remains a valuable tool for farmers worldwide.

1.6 Report Organization

Developing a thorough report layout for "AgriMan: Agricultural Management System Application" entails organizing several parts to highlight the specifics of the project, its stages of development, its features, and its results. An outline for the report layout may be seen below:

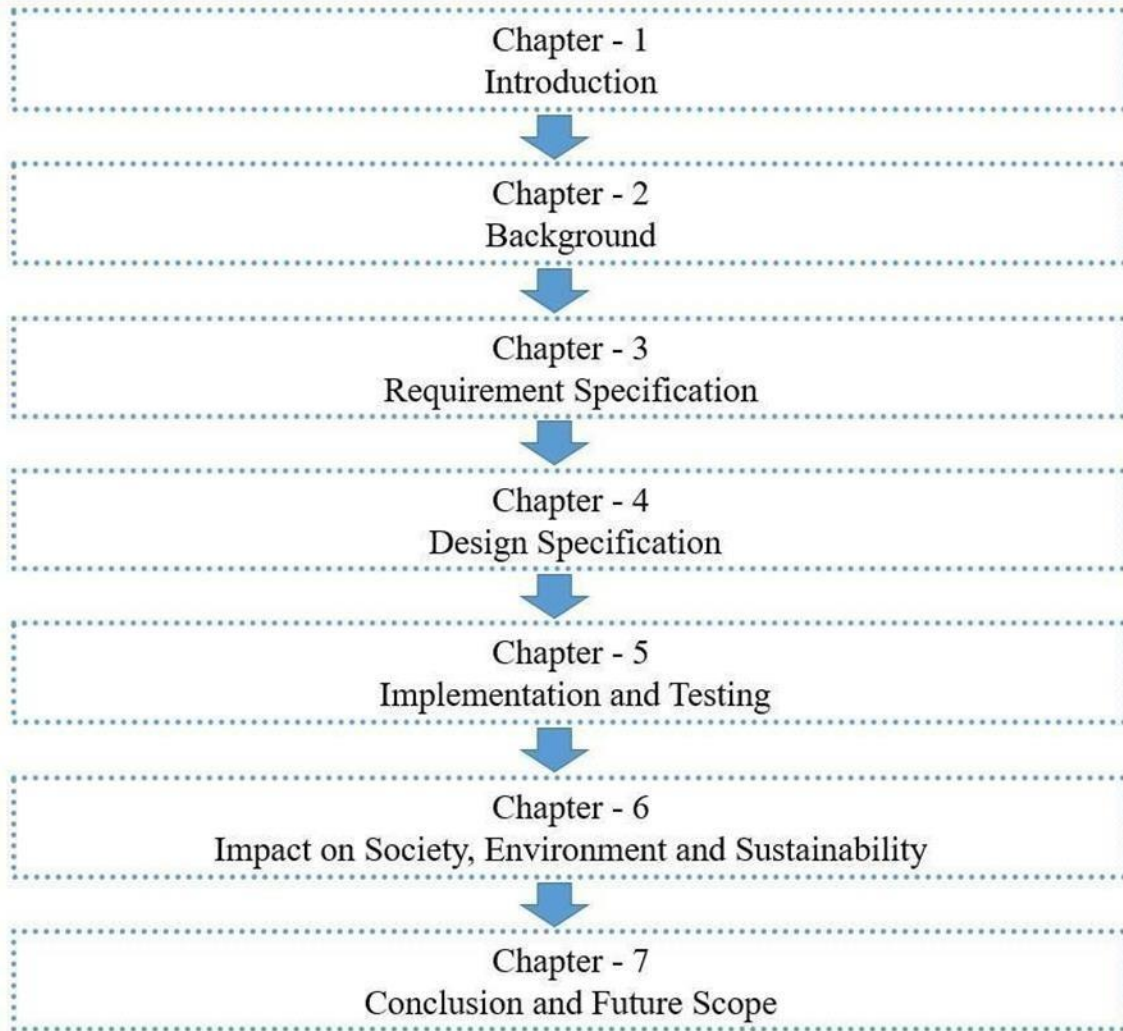


Figure 1.6.1: Report Layout of this Project.

1.7 Summary

In the rapidly evolving landscape of modern agriculture, the Agricultural Management System 'AgriMan' stands out as a pivotal technological innovation designed to revolutionize farming practices. This introduction outlines the significance and purpose of AgriMan, an Android application developed with the farmer at its core. AgriMan aims to bridge the gap between traditional farming methods and contemporary technological advancements by providing an intuitive and user-friendly platform. The application empowers farmers with essential tools such as real-time weather forecasts, market analysis,

crop management resources, and a marketplace for buying and selling agricultural products. The background section highlights the historical reliance on traditional farming methods and the gradual shift towards mechanization and advanced agricultural technologies. The problem statement identifies these key issues and underscores the need for a solution that is both accessible and comprehensive. AgriMan addresses these challenges by providing a platform that democratizes access to modern agricultural tools, fosters a community of knowledge exchange, and ensures usability for farmers with varying levels of technological literacy. The scope of AgriMan encompasses a wide range of functionalities aimed at enhancing agricultural productivity and sustainability. The introduction chapter sets the stage for understanding the transformative potential of AgriMan in modern agriculture. By equipping farmers with accessible technology and fostering a supportive community, AgriMan envisions a future where farming is more efficient, informed, and connected, ultimately contributing to a more resilient and prosperous agricultural sector.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This chapter provides a comprehensive examination of existing research and developments relevant to the Agricultural Management System 'AgriMan'. This overview sets the context for understanding the foundation upon which AgriMan is built and highlights the key areas of innovation and research that inform its design and functionality.

2.2 Related Work

Several agricultural management applications exist, offering features like weather forecasts and market prices. However, few prioritize user-friendliness and a broad community focus. Examining these existing apps will help identify strengths and weaknesses to inform AgriMan's development, ensuring it effectively addresses user needs and fosters a vibrant agricultural community.

KrishiBari: [7]KrishiBari, agricultural app, empowers farmers with data-driven insights. Leveraging satellite technology, it offers crop area analysis, health monitoring, pest/disease risk assessment, and weather forecasts. Additionally, farmers can access market prices, connect with experts, and engage in a community forum for knowledge exchange. This comprehensive platform aims to optimize decision-making and improve agricultural outcomes.

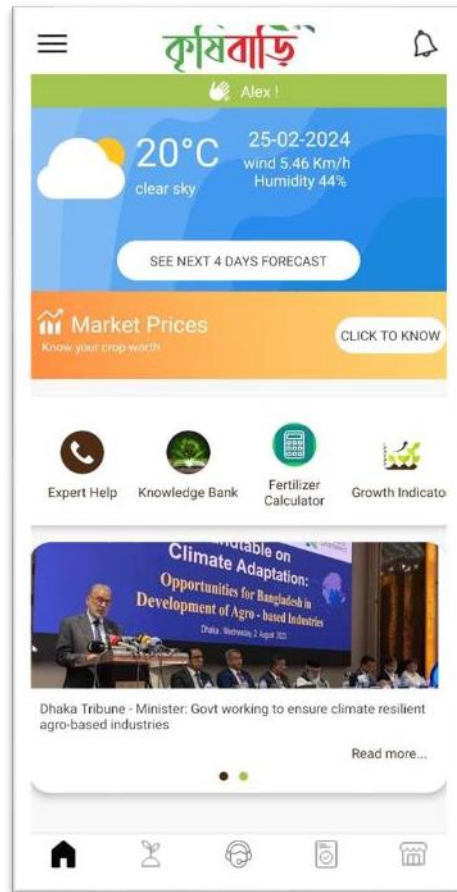


Figure 2.2.1: KrishiBari Home Page

খামারি: [6]"খামারি," a Bangladeshi app geared towards farmers, provides localized guidance for crop selection and management. Based on soil fertility and seasonality, it recommends suitable crops, fertilizer needs, and seed quantities. It also features information on crop varieties, yields, and lifespans. Additionally, farmers can access data on recommended cropping patterns, suitable areas based on location, and crop production technologies. This app empowers farmers with region-specific knowledge to optimize their agricultural practices.



Figure 2.2.2: খামারি Home Page

কৃষকের অ্যাপ: [8]"কৃষকের অ্যাপ" ("Krishoker App"), launched by the Bangladesh government, focuses on streamlining grain procurement and empowering farmers. Farmers can directly register and sell their produce to the government, eliminating middlemen and ensuring fair prices. It features current paddy specification guidelines, application submission for grain sale, and options to report any harassment. Additionally, farmers receive updates on procurement status, allocation orders, and payments through SMS and the app. This app aims to increase transparency, reduce farmer grievances, and improve the efficiency of the grain procurement system.



Figure 2.2.3: কৃষকের অ্যাপ Home Page

হাতের মুঠোই কৃষি: [5]"হাতের মুঠোই কৃষি" an Android app, offers a comprehensive suite of agricultural resources. It provides localized information on crop cultivation, pest management, fertilizer and irrigation techniques, and weather forecasts. Farmers can access a database of agricultural products, compare prices, and make informed purchases. Additionally, the app features a forum for farmers to connect, share experiences, and seek advice from experts. This app empowers farmers with knowledge and tools to enhance their agricultural practices and improve yields.



Figure 2.2.4: হাতের মুঠোই কৃষি Home Page

বাংলার কৃষি - Banglar Krishi: The [4]'বাংলার কৃষি - Banglar Krishi' application is a comprehensive tool for farmers in Bangladesh. It provides vital agricultural information such as weather forecasts, crop prices, and cultivation techniques. The app facilitates buying and selling of crops, ensuring fair transactions. Additionally, it offers a platform for farmers to share their insights and experiences, fostering a sense of community and collective learning within the agricultural sector.



Figure 2.2.5: 'বাংলার কৃষি - Banglar Krishi' Home Page

ই কৃষি সেবা - E Krishi Service: The [9]ই কৃষি সেবা - E Krishi Service' application is a digital agricultural service platform in Bangladesh. It offers farmers real-time weather updates, crop prices, and expert advice on cultivation practices. The app facilitates seamless buying and selling of agricultural produce, ensuring fair market transactions. With an easy-to-use interface, 'ই কৃষি সেবা' empowers farmers with essential information, fostering technological advancement and efficiency in agricultural practices.



Figure 2.2.6: The ই কৃষি সেবা - E Krishi Service Home Page

AgriApp - Smart Farming App: The [3]"AgriApp - Smart Farming App" caters to Indian farmers with various functionalities. Its free "Crop Doctor" tool helps identify pests and diseases. Experts offer science-backed advice on crop protection and management. Farmers can access soil testing services and weather forecasts for informed decisions. They can also buy agricultural inputs, connect with retailers, and explore relevant blogs and news. A community forum fosters knowledge exchange among farmers.



Figure 2.2.7: AgriApp - Smart Farming App Home Page

2.3 Comparative Analysis

Analyzing existing agricultural management systems reveals a varied landscape of features and functionalities. While some applications like ‘KrishiBari’, ‘খামারি’, ‘কৃষকের অ্যাপ’, ‘হাতের মুঠোই কৃষি’, ‘বাংলার কৃষি - Banglar Krishi’, ‘ই কৃষি সেবা - E Krishi Service’, ‘AgriApp - Smart Farming App’ prioritize market insights, others emphasize weather forecasting. ‘AgriMan’ distinguishes itself through a holistic approach, combining user-friendly design, real-time weather updates, market dynamics, and a collaborative community. This comparative study highlights the unique value proposition of ‘AgriMan’ in addressing multifaceted needs within the agricultural sector.

Table 1: Comparative analysis with previous work

SL No.	Application Name	User-Friendly Design	Real-Time Weather Updates	Market Dynamics	Collaborative Community	Comment
1.	AgriMan (This Work)	Designed for Bangladeshi farmers, user-friendly interface	Provides real-time weather updates	Offers information on real – time market prices and trends	Has a community section for farmers to connect	Distinguishes itself with its user-friendly layout, robust market dynamics, real-time weather updates, and community participation features.
2.	KrishiBari	Easy to use, intuitive interface	Provides real-time weather updates	Offers information on market prices, trends, and analysis	Has a forum for farmers to connect and share knowledge	Provides basic weather updates.
3.	খামারি	Simple and straightforward interface	Provides real-time weather updates	Offers information on market prices and trends	Has a community section for farmers to connect	Offers real-time weather updates.
4.	কৃষকের অ্যাপ	Designed for government procurement, easy to use	Provides real-time weather updates	Offers information on government-set prices	Does not have a community section	Provides weather updates.

5.	হাতের মুঠোই কৃষি	User-friendly interface with clear navigation	Provides real-time weather updates	Offers information on market prices and trends	Has a forum for farmers to connect and ask questions	Offers real-time weather updates.
6.	বাংলার কৃষি - Banglar Krishi	Website and YouTube channel, user-friendly	Provides weather information, but not real-time	Offers information on market prices and trends	Has a community section for farmers to connect	Offers a user-friendly design with real-time weather updates and a collaborative community platform.
7.	ই কৃষি সেবা - E Krishi Service	Government-backed app, easy to use	Provides real-time weather updates	Offers information on market prices and trends	Has a forum for farmers to connect and ask questions	Provides a user-friendly interface, real-time weather updates, and a platform for community engagement.
8.	AgriApp - Smart Farming App	Designed for Indian farmers, user-friendly	Provides real-time weather updates	Offers information on market prices and trends	Has a community section for farmers to connect	Stands out with a user-friendly design, real-time weather updates, robust market dynamics, and community engagement features.

2.4 Open Issues

While existing agricultural management apps offer valuable tools like weather forecasts and market information, open issues remain in user-friendliness and community engagement.

- ❖ **User-friendliness:** While some apps are intuitive (e.g., KrishiBari, খামারি), others lack simplicity, potentially excluding less tech-savvy farmers. AgriMan's priority on user-friendliness can address this gap by offering a clear, accessible interface tailored to diverse user experiences.
- ❖ **Community engagement:** While some apps have community features (KrishiBari, হাতের মুঠোই কৃষি), they might not be as broad or dynamic as AgriMan's vision. A truly inclusive, diverse community forum fostering knowledge exchange and peer-to-peer support can empower farmers and address their specific needs.

By addressing these identified open issues, AgriMan can stand out as a comprehensive, user-friendly, and adaptable agricultural management system that empowers farmers.

2.5 Summary

In summary, the Literature Review chapter provides a thorough examination of the key areas of research and development that inform the design and implementation of AgriMan. By analyzing the evolution of agricultural technology, the rise of precision agriculture, the role of mobile applications, the challenges of technology adoption, the importance of community and knowledge sharing, and the impact of real-time data, this chapter lays a solid foundation for understanding the innovative contributions of AgriMan to modern agriculture.

CHAPTER 3

REQUIREMENT ANALYSIS & DESIGN SPECIFICATION

3.1 Overview

The Requirement Analysis & Design Specification chapter provides a detailed exploration of the foundational aspects of the Agricultural Management System 'AgriMan'. This chapter outlines the essential requirements that drive the development and functionality of AgriMan, as well as the design specifications that ensure its effectiveness and usability for farmers.

Requirement analysis focuses on identifying and defining the functional and non-functional requirements of AgriMan. It begins with a thorough analysis of user needs, stakeholder expectations, and the specific. And The Design Specification section translates the identified requirements into a detailed blueprint for the architecture, user interface, and operational workflow of AgriMan. By delineating the specific needs of users, detailing functional and non-functional requirements, and outlining the design specifications for system architecture, database management, user interface, security, and integration, this chapter lays the groundwork for a robust and user-centric agricultural management solution.

3.2 System Design

In the System design phase first comes, the business process model for 'AgriMan: Agricultural Management System Application' revolves around streamlining and optimizing agricultural practices for farmers through a digital platform. The process begins with user registration, where farmers create accounts and log into the system, gaining access to a comprehensive dashboard. This dashboard serves as the central hub from which farmers can navigate various modules designed to address key aspects of agricultural management.

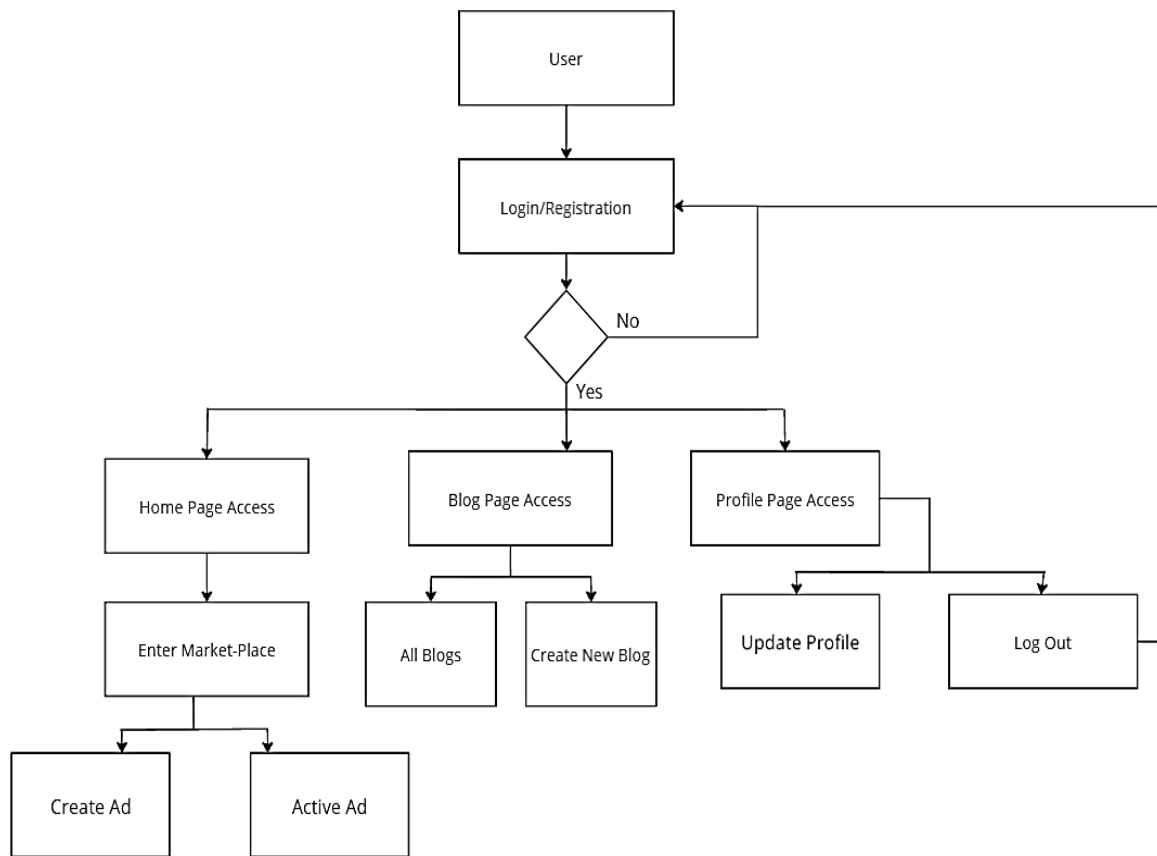


Figure 3.2.1: Business Process Modelling

In the AgriMan, Agricultural Management System Application, use case modeling involves identifying and describing various interactions between users (farmers) and the system. Use cases include tasks such as user login, weather forecasting, market price monitoring, accessing government schemes, participating in community forums, and create and view ad for buy and sell crops. Each use case is described in detail, outlining the actions performed by users and the system's responses to those actions. These use cases help in understanding the functionalities and benefits of the application for farmers, ensuring that it effectively addresses their needs and enhances agricultural management practices.



Figure 3.2.2: Use Case Diagram

AgriMan's data model centers around entities like farms, fields, crops, and livestock. Activities performed on fields and livestock are linked, while resources used on the farm connect to these activities. Sensor data collected from fields adds another layer of

information for informed decision-making.

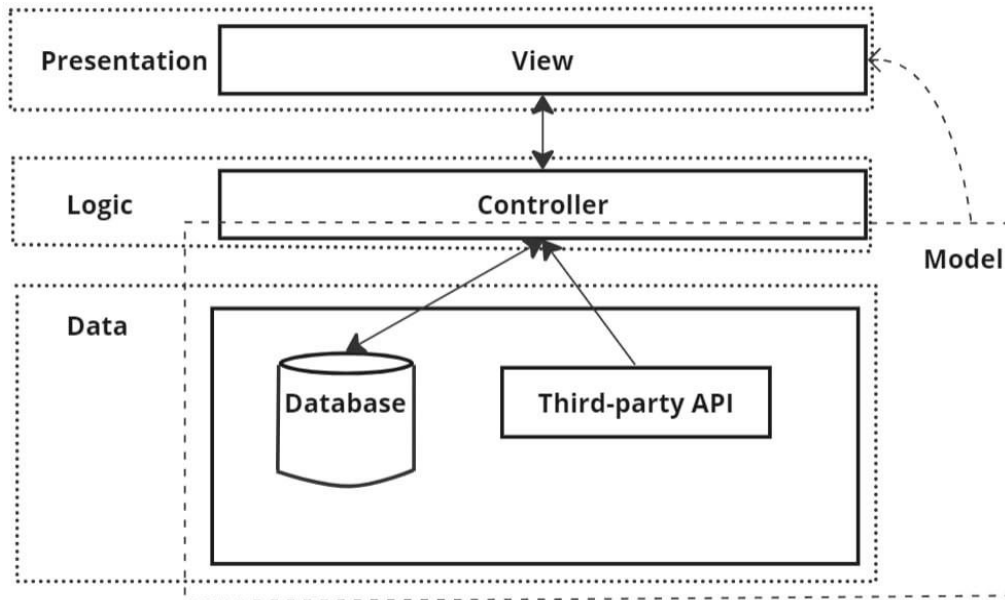


Figure 3.2.3: Logical Data Modeling.

The back-end design specification for the AgriMan: Agricultural Management System Application focuses on developing a robust and scalable infrastructure to handle data processing, storage, and management efficiently.

Additionally, the back-end design incorporates the Minimum Viable Product (MVP) architecture, which prioritizes the development of essential features and functionalities to deliver a basic, functional version of the application quickly. This MVP approach enables iterative development and incremental enhancements based on user feedback and evolving requirements, ensuring that the application remains adaptable and responsive to the needs of farmers and stakeholders over time.

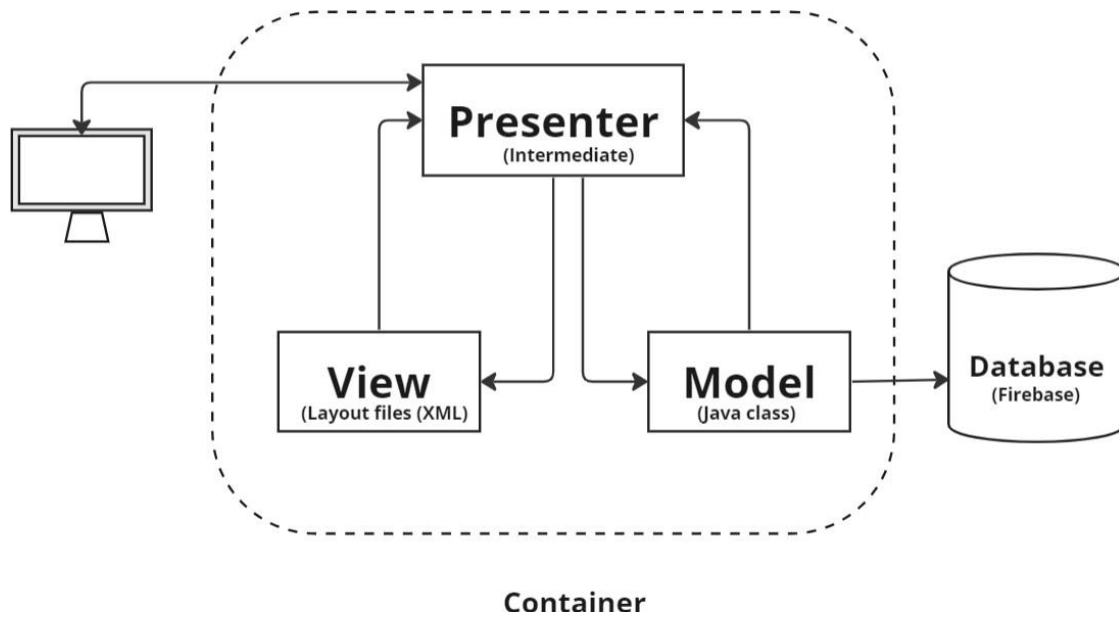


Figure 3.2.4: MVP Architecture.

3.3 Software Requirements

The Software Requirements phase for AgriMan: Agricultural Management System Application involves gathering detailed information from key stakeholders, including farmers, agricultural experts, and government agencies. This process begins with conducting surveys, interviews, and focus group discussions to understand the specific needs and challenges faced by farmers. Key requirements include features for crop management, real-time weather forecasting, pest control recommendations, market price updates, and access to government schemes. This phase also involves analyzing existing agricultural data and trends to ensure the system's recommendations are accurate and relevant. The collected requirements are then documented, prioritized, and validated with stakeholders to ensure the application effectively addresses the practical needs of its users, setting a solid foundation for the design and development phases.

- ❖ **User-Centric Approach:** The primary focus is on adopting a user-centric approach to identify the diverse requirements of farmers. Surveys, interviews, and feedback sessions are conducted to comprehend the technological proficiency, preferences, and

pain points of the end-users. This ensures that the application's features are tailored to meet the actual needs of farmers, enhancing its usability and relevance.

- ❖ **Functional Requirements:** Functional requirements are meticulously analyzed, encompassing the core features such as real-time weather forecasts, market price updates, and a user-friendly interface. The objective is to ascertain the specific functionalities that will streamline agricultural operations and contribute to the economic well-being of farmers.
- ❖ **Community Engagement Features:** The requirement analysis extends to the community aspect, investigating the preferences of farmers regarding collaborative platforms. Understanding the desired features for sharing thoughts, insights, and experiences within a community allows for the development of a vibrant and engaging space within the application.
- ❖ **Market Dynamics:** The ongoing market price feature undergoes detailed scrutiny to ensure accuracy and relevance. The requirement analysis involves studying the dynamics of agricultural markets, determining the key crops, and understanding the factors influencing market prices. This informs the design of a feature that provides valuable insights for farmers in making informed decisions regarding buying and selling of crops.
- ❖ **Usability and Accessibility:** Lastly, the requirement analysis emphasizes the usability and accessibility of the application. This involves assessing the technological literacy of the target audience and tailoring the interface to be intuitive and easily navigable. The goal is to eliminate barriers to entry, ensuring that 'AgriMan' is inclusive and beneficial to farmers across diverse backgrounds.

3.4 Project Management and Financial Analysis

Project Management:

- ❖ **Project Planning:** Define the project scope and objectives, develop a detailed timeline, allocate resources, and identify potential risks to ensure a structured and successful implementation of AgriMan.

- ❖ **Team Formation:** The team formation for AgriMan involves assembling a multidisciplinary team with roles such as project manager, developers, designers, QA testers, agricultural experts, and support staff, each bringing specialized skills to ensure the successful development and implementation of the agricultural management system.
- ❖ **Gathering Requirements:** To involves conducting stakeholder meetings, surveys, and interviews with farmers, agricultural experts, and government representatives to compile and prioritize a comprehensive list of functional and non-functional requirements for the AgriMan system.
- ❖ **Agile Development Methodology:** Use an agile methodology for iterative development through continuous cycles of planning, executing, testing, and refining features based on regular stakeholder feedback to ensure flexibility and responsiveness to changing requirements.
- ❖ **Design and Prototyping:** Develop initial wireframes and mockups for user interfaces, gather stakeholder feedback, refine designs based on input, and create interactive prototypes to demonstrate key functionalities.
- ❖ **Development and Testing:** To involves building the backend and frontend components, integrating external data sources, and conducting comprehensive testing to ensure the application is functional, user-friendly, and free of bugs.
- ❖ **Deployment and Launch:** Deploy the AgriMan application on cloud hosting services, submit mobile apps to Google Play Store, and officially launch the platform while monitoring initial user activity to ensure a smooth rollout.
- ❖ **Monitoring and Maintenance:** To involves continuously monitoring the application's performance, addressing bugs, releasing updates, and providing user support to ensure its smooth operation and ongoing improvement.

Financial Analysis:

The financial analysis for ArgiMan encompasses various aspects essential for project execution. Financial analysis assesses the economic viability and sustainability of the 'AgriMan' project. Below the table with estimated costs for different components including Domain and Hosting, visiting stakeholders, online Course or Training for learning new technology, documentation and report writing, miscellaneous and contingency of 'AgriMan'.

Table 2: Financial Analysis of AgriMan

SN	Components	Estimated Cost (BDT)
01.	Domain And Hosting	3000-3500
02.	Visiting Stakeholders	1500-2500
03.	Doing Online Course or Training for learning new technology	5500-6000
04.	Documentation and Report Writing	500-1000
05.	Miscellaneous (e.g., licenses, tools)	3000-4000
06.	Contingency (10% of total)	1350-1700
Total Estimated Cost		14,850-18,700

3.5 Summary

The Requirement Analysis & Design Specification chapter provides a comprehensive framework for the development of the Agricultural Management System 'AgriMan'. Through meticulous requirement analysis, it identifies the critical functional and non-functional needs of farmers, ensuring that AgriMan addresses key challenges such as accessing real-time weather forecasts, market analysis tools, and intuitive crop management features. The design specification section outlines a structured blueprint for AgriMan's architecture, database management, user interface, security protocols, and integration capabilities. Emphasizing user-centric design principles and scalability, the chapter lays the foundation for a robust, secure, and user-friendly application. By aligning technological capabilities with the practical needs of farmers, AgriMan aims to revolutionize agricultural management, fostering efficiency, informed decision-making, and community collaboration in farming practices.

CHAPTER 4

IMPLEMENTATION

4.1 Overview

The Implementation chapter details the practical realization of the Agricultural Management System 'AgriMan' based on the requirements and design specifications outlined in earlier chapters. This chapter focuses on the actual development process, integration of functionalities, testing procedures, and deployment strategies to ensure that AgriMan meets its intended objectives effectively. The development of AgriMan involves translating the design specifications into functional software components and features. AgriMan integrates various functionalities essential for agricultural management, including real-time weather forecasting, market analysis tools, crop management modules, and a secure marketplace for transactions. To ensure reliability and performance, rigorous testing procedures are employed throughout the implementation phase.

4.2 Prototype Design

The front-end design implementation of AgriMan: Agricultural Management System Application focuses on creating a visually appealing and intuitive user interface for farmers. This involves the development of clear navigation menus, interactive features, and responsive layouts to enhance usability and accessibility across different devices and screen sizes. Additionally, the front-end design prioritizes consistency in branding and design elements to ensure a cohesive and engaging user experience throughout the application.



Figure 4.2.1: Landing Page Design

This page is landing page of AgriMan: Agricultural Management System Application.

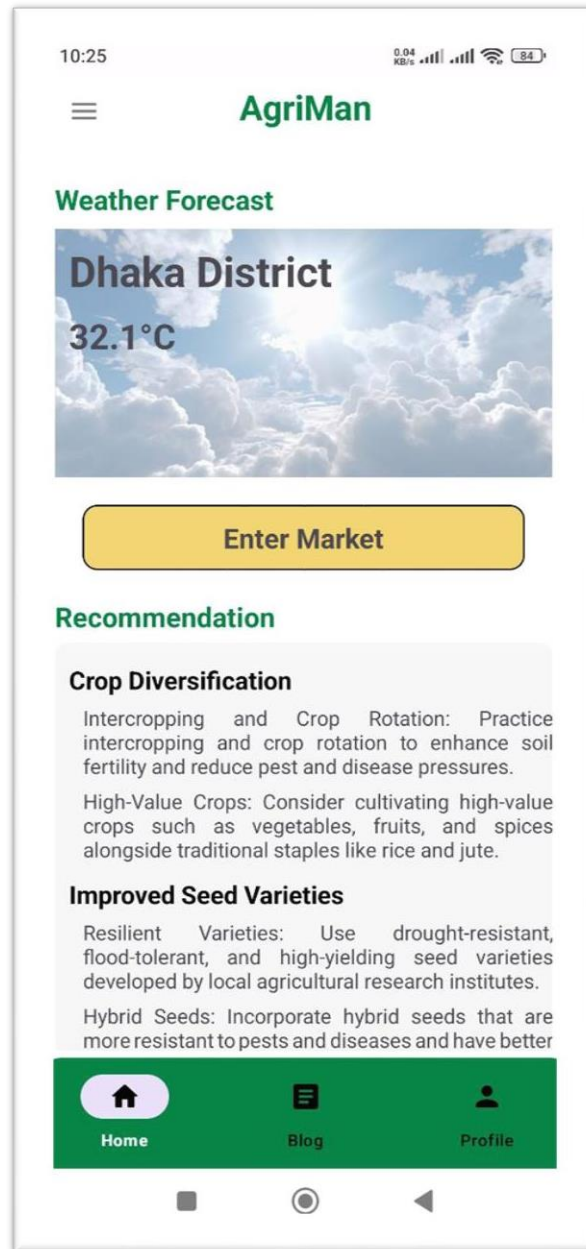


Figure 4.2.2: Home Page Design

This page is home page of AgriMan: Agricultural Management System Application. In addition, in this page user can see weather updates and can see some recommendation regarding agricultural management.

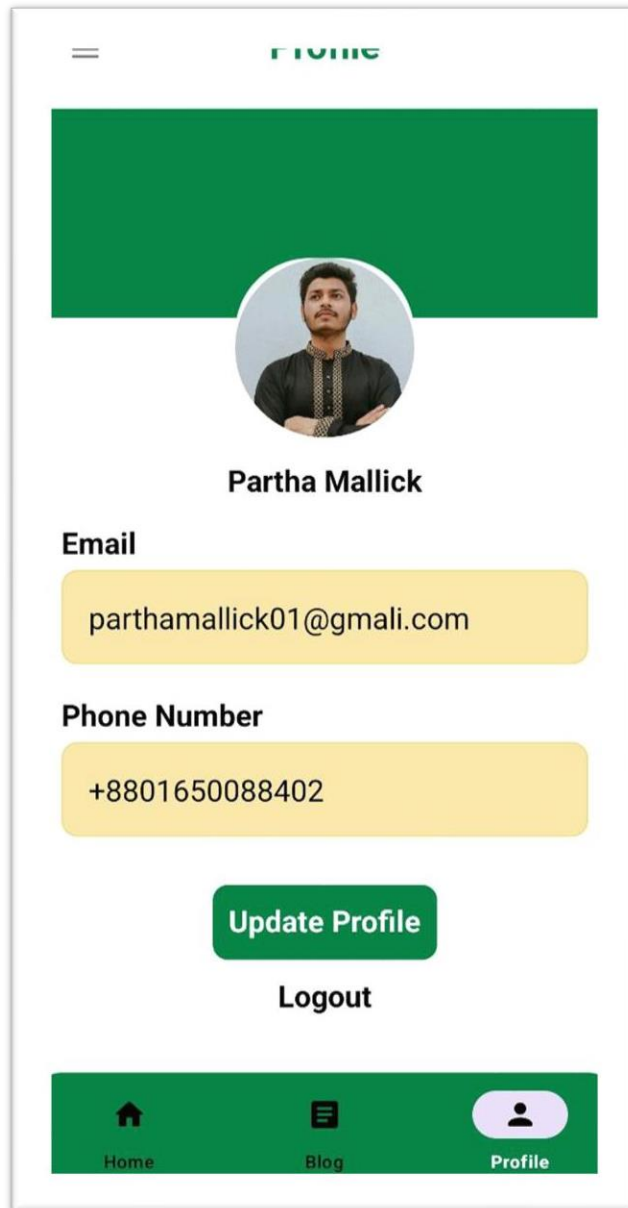


Figure 4.2.3: Profile Info page Design

This is the profile info page of AgriMan: Agricultural Management System Application. In addition, they can update their profile and log out from this application.

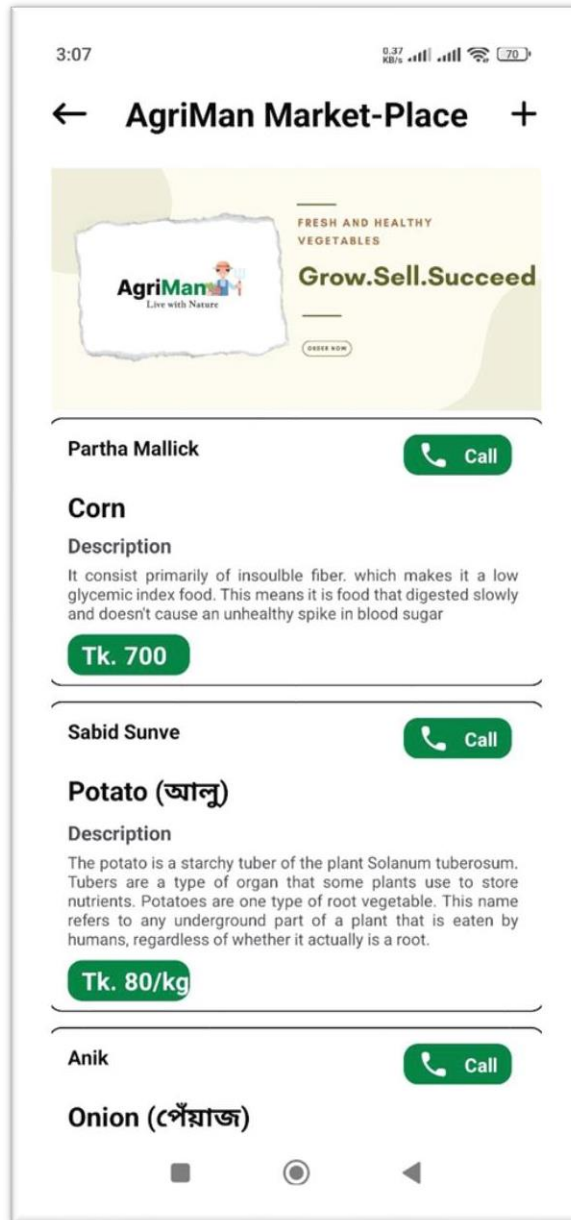


Figure 4.2.4: Market Place Page Design

This the market place page of AgriMan: Agricultural Management System Application. In this page user can see updated price of different product and can call the seller for more information about that particular product.

The image shows a mobile application screen titled "Create new Ad". At the top, there is a back arrow and the title. Below the title, there are five input fields: "Product Name", "Phone Number", "Product Price", "Product Description", and "Seller Name". Each field is represented by a light gray rounded rectangle. At the bottom of the form is a green button labeled "Create Ad". The screen is framed by a white border, and at the very bottom, there are three small navigation icons: a square, a circle, and a triangle.

3:07

← **Create new Ad**

Product Name

Phone Number

Product Price

Product Description

Seller Name

Create Ad

Figure 4.2.5: Advertisement Page Design

This is the advertisement page of AgriMan: Agricultural Management System Application. In this page, the user can post their product information for sale.

Implementation of Database

The implementation of the database for AgriMan: Agricultural Management System Application utilizes Firebase, a cloud-based platform provided by Google, offering real-time database capabilities. Firebase's NoSQL database structure allows for flexible and scalable data storage, accommodating the dynamic nature of agricultural data. Through Firebase's authentication services, users can securely access and manage their data within AgriMan. Real-time synchronization features enable seamless data updates across multiple devices and users, ensuring that farmers have access to the most up-to-date information. Additionally, Firebase's built-in analytics and monitoring tools provide insights into user behavior and system performance, facilitating continuous improvement of the AgriMan application.

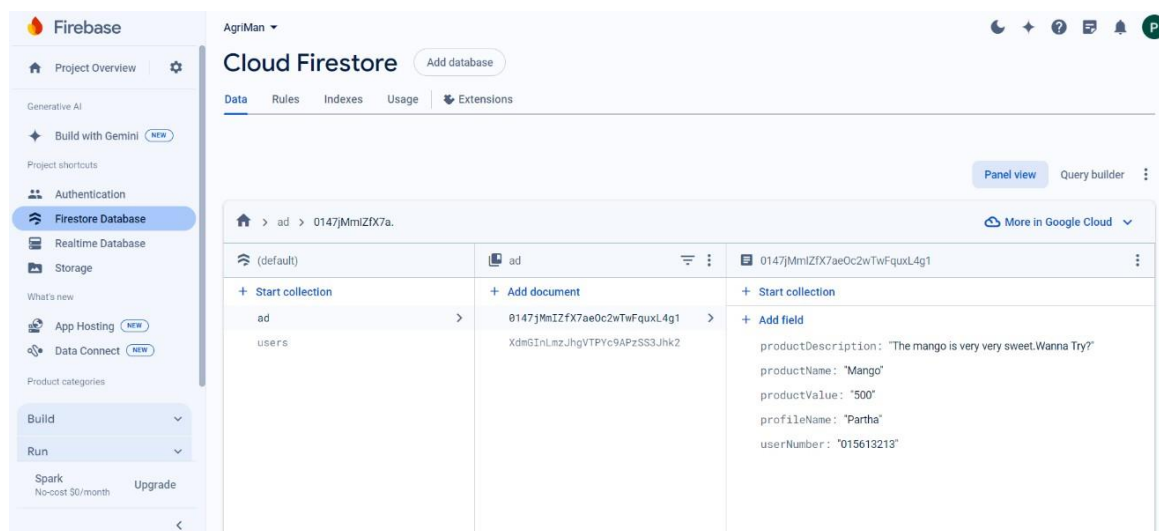


Figure 4.2.6: Database Architecture

Implementation Requirements:

The following technical, operational, and developmental elements are included in the implementation requirements for "AgriMan: Agricultural Management System Application":

❖ Front End Technologies

- XML

❖ Back End Technologies

- JAVA
- Firebase
- NoSQL

❖ Tools

- Android Studio (*IDE*)
- Postman Client
- Figma
- Android Emulator (Virtual device)
- Android Device (Physical device)

4.3 System Testing

An organized strategy is used in the testing implementation for "AgriMan: Agricultural Management System Application" to guarantee the platform's performance, security, usability, and usefulness. This is a summary of the testing protocols:

Testing Types:

- ❖ **Unit testing:** Checked that individual parts, features, and modules of ‘AgriMan’ operate as intended.
- ❖ **System Testing:** Verified that the behavior and general functionality of the ‘AgriMan’ are by the specified criteria.

- ❖ **User Acceptance Testing (UAT):** Involve stakeholders in scenario-based testing based on real-world scenarios to make sure the platform fulfills user demands.
- ❖ **Security testing:** To find weaknesses and make sure there is a strong defense against attacks, conducted security assessments with the Firebase Authentication.
- ❖ **Performance testing:** Checked the responsiveness and stability of the system by measuring its performance under varied loads with multiple device.

Testing Procedures:

- ❖ **Test Case Development:** Created comprehensive test cases covering all functionalities, edge cases, and user scenarios for 'AgriMan'.
- ❖ **Execution and Reporting:** Executed test cases systematically, record results, and generate reports detailing passed/failed scenarios.
- ❖ **Bug Tracking:** Used bug tracking tools and system to log and monitor identified issues, assigning priorities and tracking resolutions of 'AgriMan'.
- ❖ **Regression Testing:** Performed regression testing after bug fixes or new feature implementations to ensure existing functionalities remain unaffected.
- ❖ **User Feedback Incorporation:** Integrate user feedback from UAT into testing cycles to address user experience issues and enhance usability.

Testing Environments:

- ❖ **Development Environment:** Developers test individual components and functionalities in their local development environments.
- ❖ **Staging Environment:** Test integration and overall system functionalities in an environment mirroring the production environment.
- ❖ **User Testing Environment:** Involved actual users or stakeholders to perform UAT in a controlled testing environment.

By following these testing environments and procedures, " AgriMan: Agricultural Management System Application " reduces risks and guarantees a high-quality user experience by guaranteeing functionality, security, dependability, and user satisfaction

before deployment.

4.4 Summary

In summary, the Implementation chapter documents the technical execution of AgriMan, detailing the development process, integration of functionalities, testing methodologies, and deployment strategies. By adhering to established design specifications and leveraging robust development practices, AgriMan aims to deliver a reliable and user-friendly agricultural management solution. The next chapter will focus on evaluating AgriMan's performance and usability in real-world settings, providing insights into its impact on agricultural practices and farmer empowerment.

CHAPTER 5

RESULT AND ANALYSIS

5.1 Overview

This chapter of the AgriMan, focus is on evaluating the effectiveness and impact of the key functionalities. This includes an analysis of how real-time weather forecasts provided by AgriMan have enabled farmers to optimize crop planning and mitigate risks effectively. Additionally, the chapter explores the utility of the market price integration feature, assessing its role in empowering farmers with up-to-date information for informed decision-making in agricultural trade. Furthermore, it examines the community platform within AgriMan, highlighting its contribution to knowledge exchange and collaborative learning among farmers. The analysis demonstrates how AgriMan serves as a comprehensive agricultural management tool, enhancing efficiency, sustainability, and community engagement within the agricultural sector.

5.2 Simulation Result

This phase includes showcasing how farmers utilized real-time weather forecasts from AgriMan to adjust planting schedules and irrigation practices, resulting in optimized crop yields and minimized weather-related losses. The analysis of market price integration reveals how farmers accessed timely pricing data through AgriMan, enabling them to make profitable selling and purchasing decisions in hypothetical market conditions. Additionally, the community platform simulation demonstrates its effectiveness in fostering discussions among farmers, leading to shared knowledge and enhanced agricultural practices.

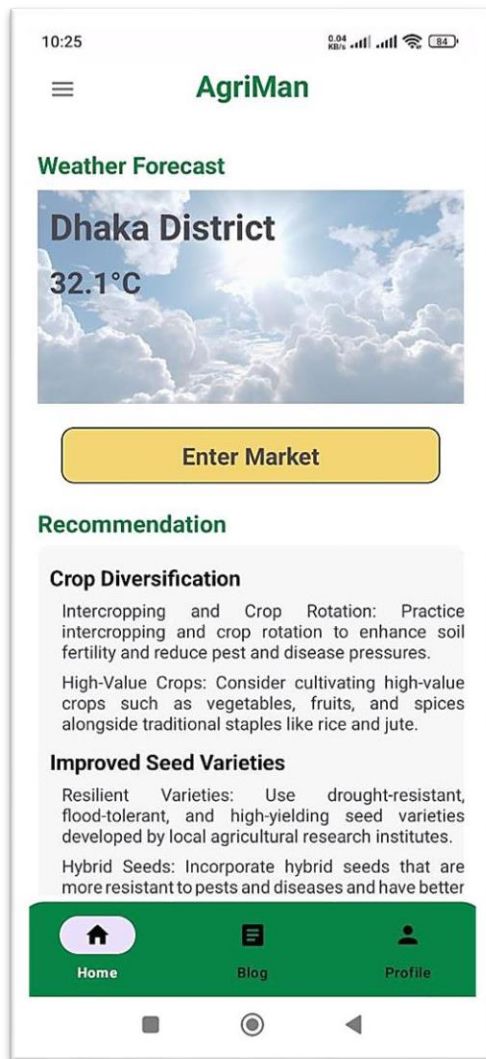


Figure 5.2.1: Implementation of Home Page

In the Home page, user can get the real-time weather forecast data which is very important specially for the farmers. They can use this data for the cultivation.

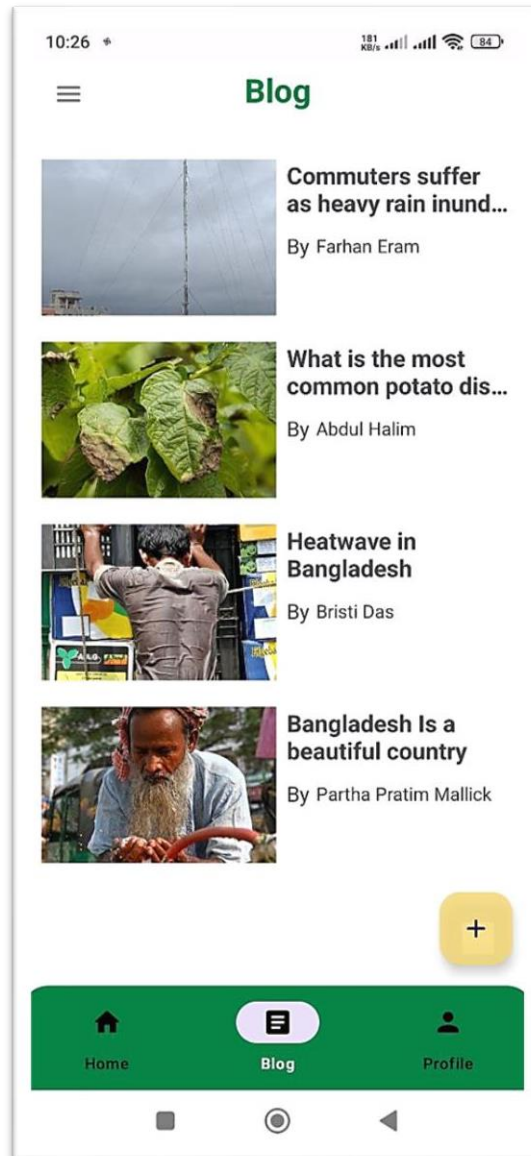


Figure 5.2.2: Implementation of Blog Page

In the Blog page, user can shear their personal knowledge related to cultivation. And this is the unique feature of AgriMan. Because, in the market of agricultural app industry this feature isn't introduced yet.

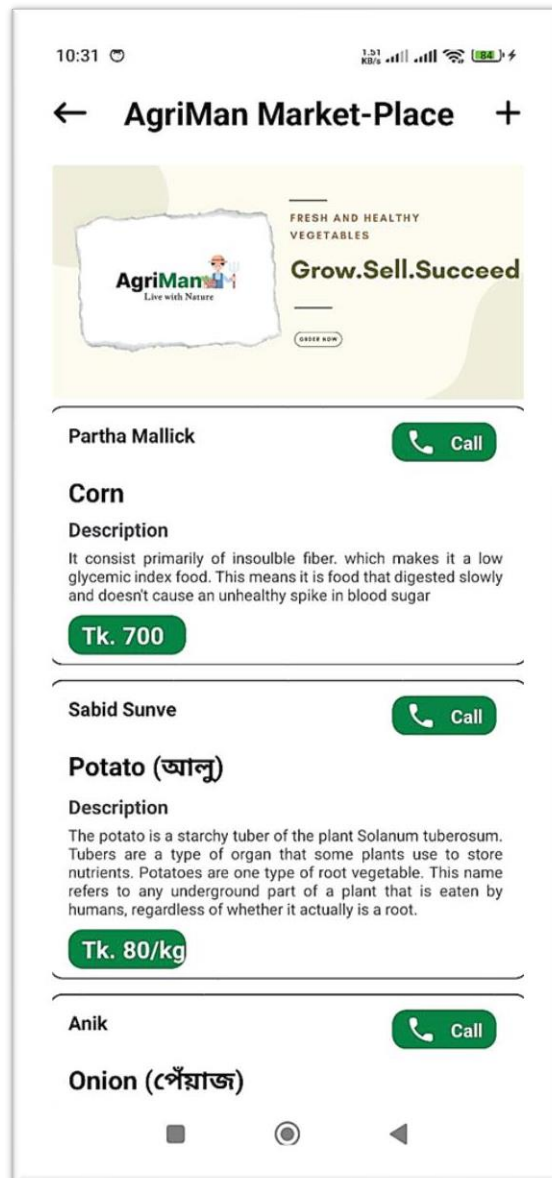


Figure 5.2.3: Implementation of Marketplace Page

Through Marketplace page, user can create the new sell advertisement or call the seller for buying any product.

5.3 Performance

In this phase of the AgriMan, a detailed assessment is provided regarding the effectiveness and efficiency of the application's functionalities. Here is a breakdown of the key aspects covered:

- ❖ **Weather Forecast Integration:** This feature evaluates how accurately AgriMan predicts and updates real-time weather conditions. Metrics such as forecast accuracy, frequency of updates, and user feedback on the reliability of weather information are discussed. The performance analysis highlights how farmers benefitted from timely weather alerts, enabling proactive decision-making in crop management and resource allocation.
- ❖ **Market Price Integration:** The performance of AgriMan's market price feature is assessed based on the timeliness and accuracy of pricing information sourced from various markets. Analysis includes comparisons between AgriMan's data and external sources, assessing discrepancies and reliability. Metrics such as price trends over time, volatility, and user satisfaction with market insights are detailed to showcase how farmers utilized this data for strategic marketing and trading decisions.
- ❖ **Community Engagement:** This section evaluates the engagement levels within AgriMan's community platform. Metrics include active user participation, frequency of discussions, and diversity of topics covered. Analysis also explores qualitative feedback on the platform's usability, effectiveness in sharing knowledge, and its role in fostering collaborative learning among farmers. The performance assessment highlights the platform's impact on community building and its contribution to enhancing agricultural practices through shared experiences and insights.

- ❖ **Overall Impact:** A holistic view of AgriMan's performance is provided, emphasizing its collective impact on agricultural efficiency, sustainability, and community empowerment. This includes qualitative testimonials from users regarding overall satisfaction, perceived improvements in productivity and profitability, and broader implications for the agricultural sector.

5.4 Summary

The overarching findings and impacts of the application are concisely encapsulated. The integration of real-time weather forecasts in AgriMan has proven highly effective in assisting farmers with crop planning and risk mitigation, leading to optimized yields and reduced losses from adverse weather conditions. The market price feature has empowered farmers with accurate and timely pricing information, enabling strategic selling and purchasing decisions that enhance profitability. The community platform within AgriMan has facilitated robust knowledge exchange and collaborative learning, strengthening the agricultural community by promoting best practices and innovation. Overall, the performance analysis demonstrates that AgriMan significantly improves agricultural efficiency, sustainability, and community engagement. The application successfully leverages technology to address key challenges faced by farmers, thus contributing to the advancement and modernization of the agricultural sector.

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT, AND SUSTAINABILITY

6.1 Impact on Life

AgriMan's real-time weather forecasts and market price integration have significantly enhanced farmers' decision-making capabilities, leading to increased productivity and financial stability. By providing timely and accurate information, AgriMan has helped farmers avoid weather-related losses and capitalize on favorable market conditions, thereby improving their livelihoods and economic resilience.

Additionally, the community platform has fostered a sense of solidarity and collective learning among farmers, promoting the sharing of best practices and innovative techniques. This collaborative environment has empowered farmers to adopt more efficient and sustainable agricultural methods, ultimately enhancing their quality of life. The accessibility and user-friendliness of AgriMan have ensured that farmers of diverse backgrounds and technological proficiency can benefit from its features, bridging the digital divide and promoting inclusive growth within the agricultural sector.

Moreover, the holistic approach of AgriMan has contributed to the well-being of farming communities by reducing the stress and uncertainty associated with agricultural activities. By leveraging technology to provide critical information and support, AgriMan has not only improved the economic conditions of farmers but also contributed to their overall mental and emotional well-being. In summary, AgriMan has had a profound positive impact on the lives of farmers, enhancing their productivity, financial security, and quality of life through the strategic use of technology.

6.2 Impact on Society & Environment

The implementation of "AgriMan: Agricultural Management System Application" holds significant potential for positively affecting society and benefiting the environment in several ways.

1. Improved Agricultural Productivity:

- Adoption of optimized crop management techniques and pest control recommendations leads to increased crop yields and overall agricultural productivity.

2. Enhanced Livelihoods for Farmers:

- Access to real-time weather forecasts, market price information, and government schemes empowers farmers to make informed decisions, resulting in improved income stability and livelihoods.

3. Sustainable Farming Practices:

- Provision of guidance on sustainable farming practices promotes environmental conservation and reduces the ecological footprint of agriculture, contributing to long-term sustainability.

4. Empowerment of Rural Communities:

- Access to agricultural expertise and resources through AgriMan fosters empowerment and self-reliance within rural communities, reducing dependency on external aid.

5. Stimulated Economic Growth:

- Improved agricultural practices and increased productivity contribute to economic growth by enhancing the profitability of farming operations and stimulating downstream industries in the agricultural value chain.

6. Integrated Pest Management:

- The pest control module of AgriMan promotes the use of integrated pest management (IPM) strategies, which prioritize biological control methods and targeted pesticide applications, thereby minimizing the environmental impact of chemical pesticides on non-target organisms and ecosystems.

7. Promotion of Sustainable Farming Practices:

- By providing recommendations on irrigation scheduling and soil nutrient management, AgriMan helps farmers optimize water and fertilizer usage, reducing wastage and minimizing environmental pollution from runoff and leaching.

6.3 Ethical Aspects

Certainly, the development and implementation of "AgriMan: Agricultural Management System Application" involve various ethical considerations:

1. Data Privacy and Security:

- Safeguarding farmers' personal data and agricultural information to ensure confidentiality and prevent unauthorized access or misuse.

2. Transparency and Accountability:

- Providing clear and transparent information about how user data is collected, stored, and used within the application, with accountability mechanisms in place to address any breaches or violations.

3. Informed Consent:

- Obtaining informed consent from users before collecting their data or sharing it with third parties, ensuring that users have control over their information.

4. Fair Treatment and Equity:

- Ensuring fair access to the application's benefits and resources, regardless of factors such as socioeconomic status, geographical location, or technological literacy.

5. Avoidance of Bias and Discrimination:

- Mitigating biases in data algorithms or recommendations to prevent discrimination against certain groups of farmers based on factors such as race, gender, or ethnicity.

6. Responsible Use of Technology:

- Ensuring that technological advancements within the application are used responsibly and ethically, with consideration for their potential social, economic, and environmental impacts.

7. Community Engagement and Participation:

- Engaging with farming communities and stakeholders to ensure that the application meets their needs and respects their values, beliefs, and cultural practice.

By implementing ethical principles into the creation and management of "AgriMan", the platform may give priority to user privacy, equity, openness, accessibility, and ethical business practices, therefore cultivating a sense of trust and integrity among its stakeholders and users.

6.4 Sustainability Plan

Developing a sustainability strategy for "AgriMan: Agricultural Management System Application" entails implementing methods to guarantee long-term sustainability, lessen the impact on the environment, and encourage moral and responsible behavior. This is an outline:

❖ Environmental Sustainability:

- **Promotion of Sustainable Farming Practices:** AgriMan encourages farmers to adopt sustainable farming techniques such as crop rotation, organic farming, and integrated pest management, reducing reliance on chemical inputs and minimizing environmental degradation.
- **Conservation of Natural Resources:** By optimizing irrigation scheduling, soil nutrient management, and pest control methods, AgriMan helps conserve natural resources such as water, soil, and biodiversity, ensuring their long-term availability for future generations.

❖ Climate Resilience and Mitigation: AgriMan's weather forecasting module

enables farmers to adapt to climate variability and extreme weather events, enhancing resilience in agriculture. Additionally, practices promoted by AgriMan, such as agroforestry and cover cropping, contribute to carbon sequestration and climate change mitigation efforts.

❖ **Responsible Data Handling:**

- **Data Privacy and Security Measures:** AgriMan implements robust data privacy and security measures to safeguard sensitive information collected from farmers, including personal details, crop data, and financial information.
- **Informed Consent and Transparency:** AgriMan ensures that farmers provide informed consent before collecting any personal or sensitive data, clearly communicating the purposes for which their data will be used and how it will be managed.

❖ **Data Minimization and Anonymization:** AgriMan follows the principle of data minimization, collecting only the necessary information required to provide its services. Additionally, sensitive data is anonymized or pseudonymized whenever possible to protect user privacy and reduce the risk of re-identification.

❖ **Social Responsibility:**

- **Empowerment of Farmers:** AgriMan empowers farmers by providing them with access to valuable agricultural resources, knowledge, and tools necessary to improve their farming practices and livelihoods.
- **Community Building and Knowledge Sharing:** AgriMan facilitates community building and knowledge sharing among farmers through features such as community forums and expert consultation services. By fostering collaboration and peer-to-peer support, AgriMan strengthens social ties and

promotes collective problem solving within agricultural communities.

❖ **Continuous Improvement:**

- **User Feedback Mechanisms:** AgriMan incorporates user feedback mechanisms such as surveys, feedback forms, and user ratings to gather input from farmers about their experiences with the application. This feedback is analyzed and used to identify areas for improvement and prioritize feature enhancements based on user needs and preferences.
- **Iterative Development Process:** AgriMan follows an iterative development process, where new features and updates are released incrementally based on feedback and user testing.
- **Data-Driven Decision Making:** AgriMan leverages data analytics and user behavior analysis to make data-driven decisions about feature prioritization, performance optimization, and user experience enhancements. By analyzing user interactions and system usage patterns, AgriMan identifies opportunities for optimization and refinement to continually enhance the application's functionality and usability.

❖ **Ethical Business Practices:**

- **Data Privacy and Confidentiality:** AgriMan upholds strict data privacy standards, ensuring that user data, including personal information and farming data, is treated with the utmost confidentiality.
- **Transparency and Accountability:** AgriMan maintains transparency in its business practices by clearly communicating its policies, terms of service, and data handling practices to users.

In conclusion, the sustainability plan for ‘AgriMan’ aims to ensure that ethical, responsible, and environmentally conscious practices are integrated into every aspect of the agricultural management system, fostering a harmonious balance between agricultural productivity,

societal well-being, and environmental stewardship.

6.5 Summary

AgriMan has significantly influenced society by enhancing farmers' decision-making capabilities, improving their economic stability, and fostering a collaborative agricultural community. Environmentally, the application promotes sustainable farming practices through precise weather forecasting and resource management, reducing waste and optimizing resource use. AgriMan's market price integration empowers farmers to make informed financial decisions, further contributing to economic resilience. Overall, the application not only advances agricultural efficiency and productivity but also supports environmental sustainability and social well-being, demonstrating a holistic approach to addressing contemporary agricultural challenges.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1 Conclusion

In the conclusion of AgriMan: Agricultural Management System Application, it becomes evident that the platform serves as a pivotal tool in revolutionizing agricultural practices by integrating advanced technologies with sustainable and ethical principles. Through its user-centric design, AgriMan empowers farmers with valuable resources, knowledge, and support, fostering community engagement and collaboration. The application's emphasis on continuous improvement, ethical business practices, and environmental sustainability underscores its commitment to promoting responsible farming practices while enhancing agricultural productivity and livelihoods. Overall, AgriMan stands as a testament to the transformative potential of technology in driving positive change in agriculture, benefiting farmers, society, and the environment alike.

AgriMan, the Agricultural Management System Application, bridges the gap between traditional farming practices and modern technological advancements. By offering a user-friendly platform for farm management, AgriMan empowers farmers to streamline operations, optimize resource allocation, and gain valuable insights from data analysis. This comprehensive approach has the potential to improve agricultural productivity, decision-making, and overall farm profitability in the face of evolving challenges. Through continued development and user feedback, AgriMan can become a vital tool for farmers to navigate the complexities of modern agriculture and ensure a sustainable future.

7.2 Further Suggested Works

"AgriMan: Agricultural Management System Application" presents several prospects for additional development and improvement:

- ❖ **Expansion of Features and Modules:** AgriMan can expand its feature set to include additional modules such as crop disease detection using image recognition technology, livestock management tools, and agricultural insurance integration to

cater to a broader range of agricultural needs.

- ❖ **Integration of Emerging Technologies:** Further developments may involve integrating emerging technologies such as Internet of Things (IoT) devices for real-time monitoring of soil moisture and crop health, and artificial intelligence (AI) for predictive analytics and personalized recommendations.
- ❖ **Enhanced Data Analytics and Insights:** AgriMan can enhance its data analytics capabilities to provide insights that are more advanced and recommendations to farmers, leveraging machine-learning algorithms to analyze large datasets and identify patterns for improved decision-making.
- ❖ **Mobile Application Optimization:** Optimization of the mobile application interface and performance to ensure seamless usability and functionality across a wider range of mobile devices and network conditions, enhancing accessibility for farmers in remote areas.
- ❖ **Integration with Agricultural Supply Chain:** AgriMan can explore opportunities for integration with the agricultural supply chain, enabling farmers to track and trace their produce from farm to market, promoting transparency, quality assurance, and fair trade practices.
- ❖ **Partnerships and Collaborations:** Collaborations with agricultural research institutions, government agencies, and non-profit organizations can facilitate further developments by leveraging expertise, resources, and funding opportunities to enhance AgriMan's capabilities and impact.

In conclusion, the future scope of AgriMan encompasses a myriad of possibilities, including the integration of emerging technologies, expansion of features, and strategic partnerships, all aimed at continuously advancing agricultural management practices and empowering farmers for sustainable and resilient agriculture.

7.3 Conflict of Interests

It is important to acknowledge potential conflicts that may arise from the development and implementation of the application. While AgriMan aims to support farmers and enhance

agricultural practices, there may be instances where commercial interests, such as partnerships with market data providers or sponsors, could influence the information presented within the app. Additionally, the integration of third-party API for weather forecasts and market prices may lead to biases or discrepancies that could affect users' trust and decision-making. It is crucial to maintain transparency and ethical standards in all collaborations and data integrations to ensure that AgriMan remains a reliable and impartial tool for the agricultural community. By addressing these potential conflicts of interest proactively, the project can uphold its commitment to supporting farmers and promoting sustainable agricultural practices.

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Appendix A

Course Outcomes, Complex Engineering Problems (EP) and Complex Engineering Activities (EA) Addressing

Title: AGRIMAN –AGRICULTURAL MANAGEMENT SYSTEM APPLICATION

Student ID: 201-15-14075 and 201-15-14086

CO Description for FYDP

CO	CO Descriptions	PO
Phase -I		
CO1	Integrate recently gained and previously acquired knowledge to identify a web-based travel management problem for the Final Year Design Project (FYDP)	PO1
CO2	Analyze different aspects of the goals in designing a solution for this FYDP	PO2
CO3	Explore diverse problem domains through a literature review, delineate the issues, and establish these goals for the FYDP	PO4
CO4	Perform economic evaluation and cost estimation and employ suitable project management procedures throughout the development life cycle of the FYDP	PO11
Phase -II		
CO5	Design and develop technical solutions and system components or processes that meet specified requirements, ensuring compliance with public health and safety standards, as well as considering cultural, socioeconomic, and environmental factors in this FYDP	PO3
CO6	Choose and apply appropriate methodologies, resources, and contemporary engineering and IT technologies to address complex engineering processes, encompassing prediction and modeling, while adhering to relevant constraints in this FYDP	PO5
CO7	Analyze societal, health, safety, legal, and cultural considerations, along with associated responsibilities, in the context of professional engineering practice and the resolution of this problem, employing logical reasoning guided by contextual understanding.	PO6
CO8	Comprehend and evaluate the enduring sustainability and impact of professional engineering endeavors in addressing intricate engineering challenges within social and environmental frameworks.	PO7
CO9	Implement ethical principles and adhere to professional standards and norms in this FYDP	PO8
CO10	Capable of operating proficiently both individually and as a team member or leader across diverse teams and interdisciplinary settings in this FYDP.	PO9
CO11	Proficiently communicate with the engineering community and broader society regarding complex engineering endeavors, including the ability to comprehend and generate comprehensive reports and design documentation, as well as provide and receive clear instructions throughout this FYDP.	PO10

CO12	Acknowledge the importance of self-directed and life-long learning within the evolving landscape of technology, and possess the readiness and capability to engage in lifelong learning endeavors.	PO12
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Addressing CO (1 to 8), Knowledge Profile (K), Attainment of Complex Engineering Problems (EP), and Attainment of Complex Engineering Activities (EA)

Addressing CO (1 to 8), Knowledge Profile (K), Attainment of Complex Engineering Problems (EP):

SN	EP Definition	Attainment	CO	Justification (with Knowledge Profile)	References
1.	EP1: Depth of Knowledge required	Yes	CO1, CO2, CO3, CO5, CO6, CO7 and CO8	The project covers Engineering Fundamentals (K3) through process modeling, data design, and front-end development, displaying strong engineering principles application. The project tackles Specialist Knowledge (K4) by integrating front-end and back-end design, interaction design, and user experience (UX), utilizing XML for the front end, and JAVA for the back end, demonstrating expertise in Android-based agricultural management system application development.	Page no: [20-24, 29-36] Section: [3.2, 4.2] Page no: [29-37] Section: [4.2, 4.3]
				The project applies engineering practice & design (K5) by integrating design requirements like user interface, security, scalability, customization, compatibility, accessibility, and reliability, ensuring a robust and user-centric agricultural management system aligned with design principles. The project addresses engineering practice & technology (K6) by employing JAVA, XML, NoSQL, and Firebase DB, emphasizing safe, scalable development.	Page no: [20-25] Section: [3.2, 3.3] Page no: [29-36]

					Section: [4.2]
				The project covers research literature K8 by reviewing analogous platforms, UI/UX studies, security protocols, personalization algorithms, and industry trends, enabling informed decision-making for integrating innovative features into this system.	Page no: [9-18] Section: [2.2, 2.3]
2.	EP2: Range of Conflicting Requirements	Yes	CO2, and CO7	The project confronts EP-2 by addressing challenges like integrating accurate weather update, balancing security with functionality, real-time data synchronization, privacy regulations compliance and flexible development.	Page no: [5-6] Section: [1.5]
3.	EP3: Depth of analysis required	Yes	CO2, and CO6	The project tackles EP-3 by prioritizing solutions like accurate weather update, real-time market price of product and blog section for shearing knowledge. For implementing blog feature in this project, we have conducted an in-depth analysis to understand the intricacies involved in implementing this feature, including researching existing libraries and frameworks, studying relevant documentation and tutorials, and experimenting with different approaches.	Page no: [29-36], Section: [4.2]
4.	EP4: Familiarity of Issues	Yes	CO8	The project fulfills EP-4 by integrating insights from agricultural management into development, optimizing processes, enhancing user experience, ensuring data security, and contributing to industry efficiency and effectiveness, bridging Computer Science and Engineering with the agricultural domain for impact beyond CSE boundaries.	Page no: [5-6, 9-16] Section: [1.5, 2.2]

5.	EP5: Extends of application codes	No	CO5	N/A	N/A
6.	EP6: Extends of stakeholders involved and conflicting requirements	No	CO8	N/A	N/A
7.	EP7: Interdependence	Yes	CO5	The project meets CEP, EP-7 by integrating several sub functionality like firebase authentication, getting weather data from API.	Page no: [29-36], Section: [4.2]

Addressing CO11 with Complex Engineering Activities (EA) [Some or all of the following]:

SN	EA Definition	Attainment	CO	Justification	References
1.	EA1: Range of resources	Yes	CO11	The development of this system leverages a skillset across domains, meticulous financial resource allocation for infrastructure, marketing, and development, and utilizes tools like Postman, Android Studio, various programming languages, and databases for effective execution.	Page no: [24-25], Section: [3.3]

2.	EA2: Level of interaction	No		N/A	N/A
3.	EA3: Innovation	No		N/A	N/A
4.	EA4: Consequences for society and the environment	Yes		This project emphasizes agriculture and environmental sustainability by enhancing agricultural management efficiency, promoting sustainable agriculture management practices, and ensuring ethical considerations such as strong security, privacy. In addition, AgriMan contributes to agricultural well-being and environmental stewardship in the agriculture industry.	Page no: [45-47, 48-51] Section: [6.1, 6.2, 6.4]
5.	EA-5: Familiarity	Yes		The Comparative Analysis for AgriMan examines competitors in the agriculture management market, such as AgriApp - Smart Farming App, Banglar Krishi and KrishiBari, to distinguish AgriMan's distinctive attributes, including its weather update, blog section for shearing knowledge, robust security measures, personalized user experience, and selling agricultural product. This analysis enriches market insights and guides strategic decisions to bolster AgriMan's competitive edge and value proposition in the agricultural management industry.	Page no: [16-19] Section: [2.3, 2.4]

Addressing CO (4, 9, 10, and 12):

SN	COs	Attainment	Justification	References
1	CO4	Yes	The project captures CO4 by integrating financial management practices, including budgeting, resource allocation, cost management, and risk mitigation, ensuring efficient fund distribution, monitoring expenditures, and identifying optimization areas while maintaining quality.	Page no: [25-27], Section: [3.4]
2	CO9	Yes	The project, AgriMan, upholds ethical standards by prioritizing user privacy through stringent data protection measures, ensuring transparent communication about data usage, fair treatment and equity and promoting accessibility for all users. These ethical practices cultivate trust, transparency, and integrity among stakeholders involved in the agriculture management platform, fostering a positive user experience and sustainable business relationships.	Page no: [47-48], Section: [6.3]
3	CO10	No	N/A	N/A
4	CO12	Yes	During the implementation phase, AgriMan prioritizes continuous learning by employing various testing methodologies, load testing, and Continuous Integration/Continuous Deployment (CI/CD) pipelines. These tactics allow the platform to adapt to changing technical trends and market demands, while detailed results analysis guides iterative enhancements for increased functionality and user happiness.	Page no: [29-36, 39-42], Section: [4.2, 5.2]

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