

A MAJOR PROJECT

on

**DEVELOPMENT OF MOBILE APP FOR DIRECT FARMER -
CUSTOMER ACCESS: ENHANCING PRICE NEGOTIATION
AND EFFICIENCY**

Submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

In partial fulfilment of the requirement for the award of the degree of

BACHELOR OF TECHNOLOGY

in

ELECTRONICS AND COMMUNICATION ENGINEERING

By

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



**MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY & MANAGEMENT**

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

NAAC Accredited Institution with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

October, 2024



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Date:

CERTIFICATE

This is to certify that the project work entitled “**DEVELOPMENT OF MOBILE APP FOR DIRECT FARMER-CUSTOMER ACCESS: ENHANCING PRICE NEGOTIATION AND EFFICIENCY**” work done by **NAZMEEN (217Y1A04F4), J.NIKHIL REDDY**

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students of Department of Electronics and Communication Engineering, is a record of bonafide work carried out by the members during a period from August, 2024 under the supervision of **G.Siva Sankar Varma**. This project is done as a fulfilment of obtaining Bachelor of Technology Degree to be awarded by Jawaharlal Nehru Technological University Hyderabad, Hyderabad.

The matter embodied in this project report has not been submitted by us to any other university for the award of any other degree.

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Date:

(G.Siva Sankar Varma)

The Viva-Voce Examination of above students, has been held on.....

Head of the Department

External Examiner

Principal/Director

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We would like to express my sincere gratitude to my guide **G. Siva Sankar Varma , Associate Professor**, Department of ECE, for his/her excellent guidance and invaluable support, which helped me accomplish the B.Tech (ECE) degree and prepared me to achieve more life goals in the future. His total support of my dissertation and countless contributions to my technical and professional development made for a truly enjoyable and fruitful experience. Special thanks are dedicated for the discussions we had on almost every working day during my project period and for reviewing my dissertation.

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TABLE OF CONTENTS

| | | | | Page No. |
|-------------------------------------|-----|-------|--|-------------|
| <i>Certificate</i> | | | | <i>ii</i> |
| <i>Acknowledgements</i> | | | | <i>iii</i> |
| <i>Table of Contents</i> | | | | <i>iv</i> |
| <i>List of Figures</i> | | | | <i>vi</i> |
| <i>List of Abbreviations</i> | | | | <i>vii</i> |
| <i>List of Tables</i> | | | | <i>viii</i> |
| <i>Abstract</i> | | | | <i>ix</i> |
| Chapter 1: Introduction | | | | X-X |
| | 1.1 | | | X |
| | 1.2 | | | X |
| | | 1.2.1 | | X |
| | | 1.2.2 | | |
| | 1.3 | | | |
| | | 1.3.1 | | |
| | 1.4 | | | |
| Chapter 2: Literature Survey | | | | X-X |
| | 2.1 | | | X |
| | 2.2 | | | X |
| | | 2.2.1 | | |
| | | 2.2.2 | | |
| | 2.3 | | | |
| | 2.4 | | | |
| | 2.3 | | | |
| Chapter 3: | | | | |
| | | | | X-X |
| | | | | |
| | | | | |

| | | | | |
|------------------------------|--|--|--|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| <i>References</i> | | | | |
| <i>Publications (if any)</i> | | | | |

LIST OF FIGURES

| Figure No. | Name of the Figure | Page No. |
|------------|--------------------|----------|
| Figure 1.1 | | |
| Figure 1.2 | | |
| Figure 1.3 | | |
| Figure 2.1 | | |
| Figure 3.1 | | |
| Figure 3.2 | | |
| Figure 4.1 | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

LIST OF ABBREVIATIONS

| | |
|--|--|
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| | |
| | |
| | |
| | |
| | |

LIST OF TABLES

| Table No. | Name of the Table | Page No. |
|-----------|-------------------|----------|
| Table 3.1 | | |
| Table 3.1 | | |
| Table 3.1 | | |
| Table 3.1 | | |
| | | |
| | | |
| | | |

ABSTRACT

Farmers often face significant challenges in accessing markets due to the reliance on middlemen, which results in reduced income and unfair pricing. This project proposes the development of a mobile application designed to bridge the gap between farmers and buyers, including consumers and retailers. The application aims to empower farmers by providing a direct platform to list their produce, negotiate prices, and manage transactions without intermediary involvement. By facilitating a direct market connection, the app will enhance farmers' income potential and ensure fairer prices for their produce.

The expected outcome is a user-friendly mobile platform that simplifies the process of selling agricultural products, thereby improving market access and profitability for farmers. This solution addresses the critical need for market transparency and efficiency in the agricultural sector.

Agricultural markets are often dominated by intermediaries who act as middlemen between farmers and consumers, leading to significant financial losses for farmers and inflated prices for buyers. This traditional market structure creates a substantial gap in access and efficiency, where farmers are frequently unable to directly connect with consumers and retailers, hindering their ability to negotiate fair prices and optimize their income.

To address this critical issue, we propose the development of a comprehensive mobile application designed to revolutionize market access for farmers. The app, named "Agri Connect," aims to bridge the gap between farmers and buyers by providing a seamless platform for direct interaction and transactions. By leveraging modern technology, Agri Connect will empower farmers to showcase their produce, engage in price negotiations, and manage transactions without the need for intermediaries.

CHAPTER 1

INTRODUCTION

1.1 PROBLEM IDENTIFICATION

Farmers often struggle to access markets directly, leading to reliance on intermediaries who reduce their income by capturing a significant share of profits. This dependence on middlemen limits farmers' ability to sell produce at fair prices, impacting their livelihoods and economic stability. Additionally, the lack of direct market access creates inefficiencies and reduces transparency in the supply chain, inflating costs for consumers. Addressing this issue is essential to empower farmers, ensuring they receive fair compensation and fostering a more equitable and efficient agricultural marketplace.

1.2 INTRODUCTION

This project tackles the issue faced by farmers who often struggle to access markets directly, resulting in their reliance on intermediaries that significantly reduce their income. These middlemen capture a substantial share of the profits, limiting farmers' ability to sell their produce at fair prices and affecting their economic stability. The proposed solution is "AgriDirect," a mobile application designed to bridge this market gap by connecting farmers directly with consumers and retailers.

The app will feature capabilities for listing produce, negotiating prices, and managing transactions, thereby reducing dependence on intermediaries. By offering farmers direct market access, AgriDirect aims to ensure fair pricing, enhance income potential, and create a more transparent and efficient agricultural supply chain.

This solution seeks to improve farmers' economic conditions and foster a more equitable marketplace, benefiting both producers and consumers through better communication and reduced costs. AgriDirect has the potential to revolutionize the agricultural sector by empowering farmers and streamlining the supply chain.

In today's rapidly evolving agricultural landscape, there is a growing need for innovative solutions that bridge the gap between farmers and consumers. Traditional supply chains often result in inefficiencies, with farmers facing challenges in accessing markets and consumers lacking direct access to fresh produce. This project aims to develop a mobile application that facilitates direct communication and transactions between farmers and customers, enhancing price negotiation and overall efficiency in the agricultural supply chain.

The proposed mobile app will empower farmers by providing them with a platform to showcase their products, set prices, and engage directly with customers. For consumers, the app will offer a user-friendly interface to browse available products, negotiate prices, and make informed purchasing decisions. By leveraging technology, we aim to create a more transparent and equitable marketplace that benefits both parties.

Key features of the app will include real-time price updates, secure payment options, and a messaging system to facilitate negotiations. Additionally, the app will include educational resources to inform users about sustainable farming practices and seasonal produce availability. Through this initiative, we seek to promote fair trade, enhance local economies, and contribute to the sustainability of the agricultural sector.

Ultimately, this project not only aims to improve market access for farmers but also strives to enhance consumer awareness and engagement, fostering a stronger connection between food producers and consumers. By addressing the challenges faced by both sides, we envision a more efficient and sustainable agricultural ecosystem that benefits everyone involved.

1.3 OBJECTIVES

The mobile app for direct farmer-customer access aims to enhance price negotiation and efficiency by facilitating direct communication between farmers and customers, ensuring price transparency with real-time market data, and providing robust negotiation tools like counter-offer options and in-app messaging. It streamlines transactions through integrated payment solutions and order tracking while offering a user-friendly interface that accommodates varying levels of technological proficiency. Educational resources on negotiation tactics and agricultural best practices empower users, while a feedback mechanism fosters trust within the marketplace. The app also expands market access for farmers, utilizes data analytics for informed decision-making, and promotes sustainability and fair trade, ultimately creating a more equitable and efficient agricultural marketplace.

1.4 SCOPE

The scope of the project for developing a mobile app for direct farmer-customer access encompasses targeting farmers and consumers interested in fresh agricultural products. Key features include user registration, product listings with real-time pricing, in-app communication for negotiations, secure payment integration, and order management. The app will also provide educational resources on negotiation strategies and farming practices, along with a rating and review system to build trust. Initially focused on local markets, the project will utilize a suitable technology stack for cross-platform compatibility and include a user support system. Clear timelines and budget requirements will guide the development phases, ultimately aiming to create a comprehensive platform that enhances transactions and fosters a sustainable agricultural marketplace.

1.5 EXPECTED OUTCOMES

The expected outcomes of the mobile app for direct farmer-customer access include enhanced direct access for farmers to consumers, reducing reliance on intermediaries and improving profit margins. With transparent pricing and effective negotiation tools, both parties will engage in fairer deals, leading to increased sales and market reach for farmers. Customers will be empowered with knowledge about products and market trends, facilitating informed purchasing decisions. The integration of secure payment and order management systems will streamline transactions, while a rating and review system will foster trust and satisfaction. Additionally, the app will provide valuable data-driven insights to help users make informed decisions, promoting sustainable farming practices and ethical consumerism. Overall, the project aims to create a more equitable, efficient, and transparent agricultural marketplace, benefiting both farmers and consumers alike.

CHAPTER 2

LITERATURE SURVEY

There are a variety of Mobile app developments in the marketplace, designed to make farming easy. Some mobile applications have designed to specifically provide information services to farmers. In this work various research paper and Mobile App have reviewed related to agriculture sector.

Santosh G. Karkhile, Sudarshan G. Ghuge “A Modern Farming Techniques using Android Application” 2015[1]-In this paper researcher given a entire idea about develop a mobile phone based solution that helps in farm management, leads to agricultural yield improvement and helps in farm maintenance. Researcher explain that traditional farming tolerated unexpected environment where as, Modern farming provide expected environment by weather forecasting. Traditional farming requires large amount of labor and different activities for conducting farming. Alternatively Modern farming does not require huge amount of labor as the mobile, machines and new technology take care of the whole thing. This mobile application provides real time weather information, news and market prices at diverse locations and all information is provided in local languages. So, all the outcomes of researcher application are aid farmer to improve their agriculture to yield more earnings. author expand the System Architecture for the farmer app which include different operations like registration of farmers Weather forecasting, News and feeds, Multiple language support, Market trading.

Suporn Pongnumkul, Pimwadee Chaovalit, Navaporn Surasvadi “Applications of Smartphone-Based Sensors in Agriculture: A Systematic Review of Research” 2015[2] This research represents reviews on Smartphone applications that use Smartphone built-in sensors to give agricultural solutions. According to agriculture function applications are categorized. Researcher literature review describe different types of agriculture application like farming applications, farm management applications, information system applications and extension service applications. Various functionality in farming make simple using this application like Disease Detection and Diagnosis, Soil Study ,Crop Water Needs Estimation, HR Management, Information System Applications.

Alcardo A. Barakabitze , Edwin J. Kitindi “New Technologies for Disseminating and Communicating Agriculture Knowledge and Information: Challenges for Agricultural Research Institutes in Tanzania”2015[3]-In this paper researcher explores how a extensive range of Information and Communication Technologies (ICTs) accessible in Agricultural Research Institutes (ARIs)and how farming researchers make effective use of a wide range of ICT tools allied to ,crop variety, land use, irrigation, soil nutrients requirement, weather report, pest and disease control, awareness about crops, pollution control, and new farming techniques.

K. Lakshmisudha and SwathiHegde “Smart Precision based Agriculture using Sensors” 2016[4] Author represents wireless sensor networks which can help bring about a great revolution in automating agriculture field. This research project makes plant monitoring process easy as well as reduced human effort in farming day to day activity. User can produce customized environment to the plants. This application provides most favorable growth conditions using different sensors.

Hemlata Channe and Sukhesh Kothari “Multidisciplinary Model for Smart Agriculture using Internet-of-Things (IoT), Sensors, Cloud- Computing, Mobile- Computing & Big-Data Analysis”[5]-In this research the proposed architecture of multidisciplinary model is shown which consists of the five modules: 1) Sensor Kit Module. 2) Mobile App Module. 3) Agro Cloud Module. 4) Big-Data Mining, Analysis and Knowledge Building Engine Module. 5) Government &Agro Banks UI In second module researcher explores uses of Mobile applications for farmers. researcher focus on main three part a. UI for farmer b. UI for agro marketing agency c. UI for agro vendors including fertilizer. By this module all the agriculture related entities are linked together, this model also make possible supply of harvested crops to the agro marketing agencies and different agriculture products and services from agro vendors can get by farmers on this app. This model also facilitates estimates of total production per crop in region wise and state wise, total fertilizer requirements. This will be helpful to keep the cost of agricultural products in control. Through notifications farmers also informed about current schemes for agriculture.

Shailaja Patil and Anjali R. Kokate “Precision Agriculture: A Survey” 2015[6]-In this paper researcher explores how different mobile phone application and precision

agriculture services have impacted the farmer's life in their agricultural activities. Android apps offer proficient functionality to be grown-up with technology. In the ground like precision agriculture farmers get extra benefits from the mobile apps which are developed for the agriculture monitoring purpose and vital information exchange. Mobile apps that are use for agriculture monitoring are of special types which provide information like weather information, market rate and availability, government scheme details etc. Author provides following some apps details used for monitoring and data information exchange purpose

- 1) Mkisan application: This android app is designed and developed by CDAC Pune. This app is useful for assistances to farmers.
- 2) Shetkarimasik android app "ShetkariMasik" is extremely popular monthly magazine in the farming sector since 1965. Department of Agriculture in Maharashtra published Shetkarimasik mobile app. The important feature of this app is after registration process without use of internet user can upload information on the portal
- 3) Farm -o-Pedia this app has been developed by CDAC, Mumbai. Multiple language support facility is provided by this app. This Android application is intended for farmers or anybody linked to agriculture in rural Gujarat. This application is available in English and Gujarati language. The functions of the app are: Obtaining crop-wise information, Monitoring suitable crops according to soil and season, monitor weather and managing cattle in the herd etc.
- 4) Markets near me -This mobile app is use to get the market price of crops in the markets in the area near of 50 km of user location. It captures the location of mobile user through sensor and displays the crop's market price of markets nearer to the user.

Shubham Sharma, Viraj Patodkar, Sujit Simant, Chirag Shah Prof. Sachin Godse "E-Agro Android Application"(Integrated Farming Management Systems for sustainable development of farmers) 2015[7]-In this paper author explain software application which is essentially for sustainable growth of farmers. A lot of time farmer is confused to get decision regarding selection of pesticide, fertilizer and specific time to do particular farming actions. So to minimize such type of problem this application is very useful for farmers. Fertilizer schedule is registered for various crops. Based on sowing date of crop, farmers get reminders about use of fertilizer as per plan. Additional advice are also given based on soil type, climatic condition etc. This system merges modern Internet technique and mobile communication systems with GPS for proficient and smooth farming.

Shitala Prasad, Sateesh K. Peddoju and Debashis Ghosh “Agro Mobile: A Cloud-Based Framework for Agriculturists on Mobile Platform” 2013[8]-This paper explore different ways in which a farmer be able to use MCC(Mobile Cloud Computing) on their handsets by application called Agro Mobile, This mobile application is very useful to assist farmers for relatively superior cultivation and marketing. The major consideration of this work is paying attention on crop image analysis. Image processing techniques requires huge amount of computation power as well as large memory to process so that purpose a mobile devices fails. Hence, this framework uses the concept of MCC these authors consider that, puts cloud into a farmer’s pocket. For this research an Android based mobile devices are used.

M. V. Bueno- Delgado , J. M. Molina-Martínez , R. Correoso-Campillo , P. Pavón-Mariño “Ecofert: An Android application for the optimization of fertilizer cost in fertigation “2015[9]-In this paper researcher focus on efficient management of fertilizers is reflected into a saving of money and time. In this work Ecofert is presented as easy and powerful software application developed for Android O.S. that calculates the most excellent combination of fertilizers to get the desired nutrient solution for different crops. In this application current price of fertilizers in the market are also considered. The most important novelties of Ecofert are, first thing is it solves the fertilization mixture by modeling this as a Linear Programming problem, and using specific mathematical libraries to resolve it. On the other hand, Ecofert works with a list of marketable fertilizers hosted in a Data Base in the Cloud, where the composition and cost is updated daily. In addition Ecofert shows a low down computational cost, even for huge number of fertilizers (>20). Ecofert is simple application so easily execute in mobile devices, giving farmers and crop growing technicians a powerful tool to support for agricultural tasks.

Sotiris Karetos, Constantina Costopoulou, Alexander Sideridis “Developing a smart phone app for m-government in agriculture”2014[10]-In this paper author take review on smart phone use and capabilities in farming. Based on different agriculture case study author propose mobile government app for the Android operating system. The mobile government app is based on a earlier developed electronic government system for farmers. Such apps look forward to be a promising solution for farmers enabling them to access government information and transact

with public agencies at their convenience and at a location of their choice.

Iffco Kisan App[11] :-Iffco Kisan is farming app for Kisan. It utilizes less memory and gives easy interface. This android mobile application gives diverse information to farmers like latest mandi prices, latest agriculture advice, farming tips to make farming easy. It moreover provides agriculture alerts to farmers in different Indian languages. The farmers can effortlessly take help from crop growing experts using this app.

Agri Media Video App [12]:-In video category Agri Media Video App is trendy mobile apps for farmers. It provide online market place ,farming retail, fulfill farming services on online platform .Out of 5 total 4.8 rating has get by this mobile app. Using this app farmers easily communicate with agriculture expert to solve their problems. Farmers can view diverse agriculture video through it.

Farm Bee - RML Farmer [13]:- Farm Bee is also one of the agricultural app used for various purposes. It gives productive farming content and information within every stage of the crop life cycle. A farmer can select different crop varieties, markets using this app. It also provides mandi price and weather forecast based on a user location. In terms of memory utilization it is small in size. It gives multiple language support facility.

CHAPTER 3

REQUIREMENT ANALYSIS

3.1 Software Requirements

We want to implement by using below Softwares:

1. KOTLIN
2. FIREBASE
3. XML
4. JAVA
5. CSS
6. FIGMA
7. FLUTTER

1. Kotlin

Kotlin is the primary programming language for Android app development, known for its concise syntax and modern features. It enhances productivity by reducing boilerplate code and improving readability. Kotlin also incorporates null safety, which helps prevent common runtime errors related to null references. By using Kotlin in this project, developers can leverage its seamless interoperability with Java, allowing for gradual migration of existing Java codebases while taking advantage of Kotlin's enhanced features for developing the mobile app.

2. Firebase

Firebase is a powerful backend-as-a-service platform that provides a suite of tools for building and managing mobile applications. In this project, Firebase will facilitate user authentication, allowing users to securely register and log in to the app. It also offers a real-time database for managing product listings and transactions, enabling instant updates for users. Additional features, such as cloud storage for images and analytics for tracking user behavior, will enhance the overall functionality and user experience of the app.

3. XML

XML (eXtensible Markup Language) is a markup language used for defining the structure of user interfaces in Android applications. In this project, XML will be utilized to design the app's layouts, including screens for product listings, user profiles, and transaction management. By structuring the UI elements with XML, developers can maintain a clear separation between design and functionality, making it easier to update and manage the user interface as the app evolves.

4. Java

Java is a well-established programming language that has been a cornerstone of Android development for years. While Kotlin is the preferred language for new developments, Java remains relevant due to its extensive library ecosystem and backward compatibility. In this project, Java can be utilized to integrate with existing Java-based libraries and services, ensuring that the app can leverage a wide range of functionalities without rewriting code. This interoperability will allow for a smoother development process and enhanced app performance.

5. CSS

Cascading Style Sheets (CSS) is a stylesheet language used for styling web applications. If the project includes a web version or any web-based components, CSS will play a crucial role in defining the look and feel of the user interface. By applying CSS, developers can create visually appealing layouts, manage colors, fonts, and spacing, and ensure a consistent design across different devices and screen sizes. This will contribute to a cohesive user experience for both mobile and web users.

6. Figma

Figma is a collaborative design tool widely used for creating user interfaces and prototypes. In this project, Figma will be instrumental in the design phase, allowing designers to craft intuitive and visually appealing layouts. Its collaborative features enable real-time feedback and revisions, ensuring that the design aligns with user needs and project goals. By utilizing Figma, the development team can create high-fidelity mockups and prototypes, which will serve as a blueprint for the app's implementation.

7. Flutter

Flutter is a modern UI toolkit developed by Google for building natively compiled applications for mobile, web, and desktop from a single codebase. In this project,

Flutter can be used to create a cross-platform app that runs smoothly on both Android and iOS devices. Its rich set of pre-built widgets and fast development capabilities enable rapid prototyping and a consistent user experience across platforms. By leveraging Flutter, the project can minimize development time while ensuring high performance and aesthetic appeal in the final product.

In the mobile app project for direct farmer-customer access, Kotlin serves as the primary programming language, enabling concise and efficient Android development with improved null safety. Firebase provides essential backend services, facilitating user authentication, real-time data management for product listings, and analytics to enhance user experience. XML is utilized to structure the app's user interface, defining layouts for various screens while maintaining a clear separation between design and functionality. Java supports interoperability with existing libraries, ensuring a smooth integration of various functionalities. CSS is employed to style any web components of the app, creating visually appealing and consistent designs across platforms. Figma plays a crucial role in the design phase, allowing for collaborative creation of intuitive UI mockups and prototypes. Lastly, Flutter enables cross-platform development, allowing the app to run seamlessly on both Android and iOS devices with a rich set of pre-built widgets, thereby minimizing development time and ensuring high performance.

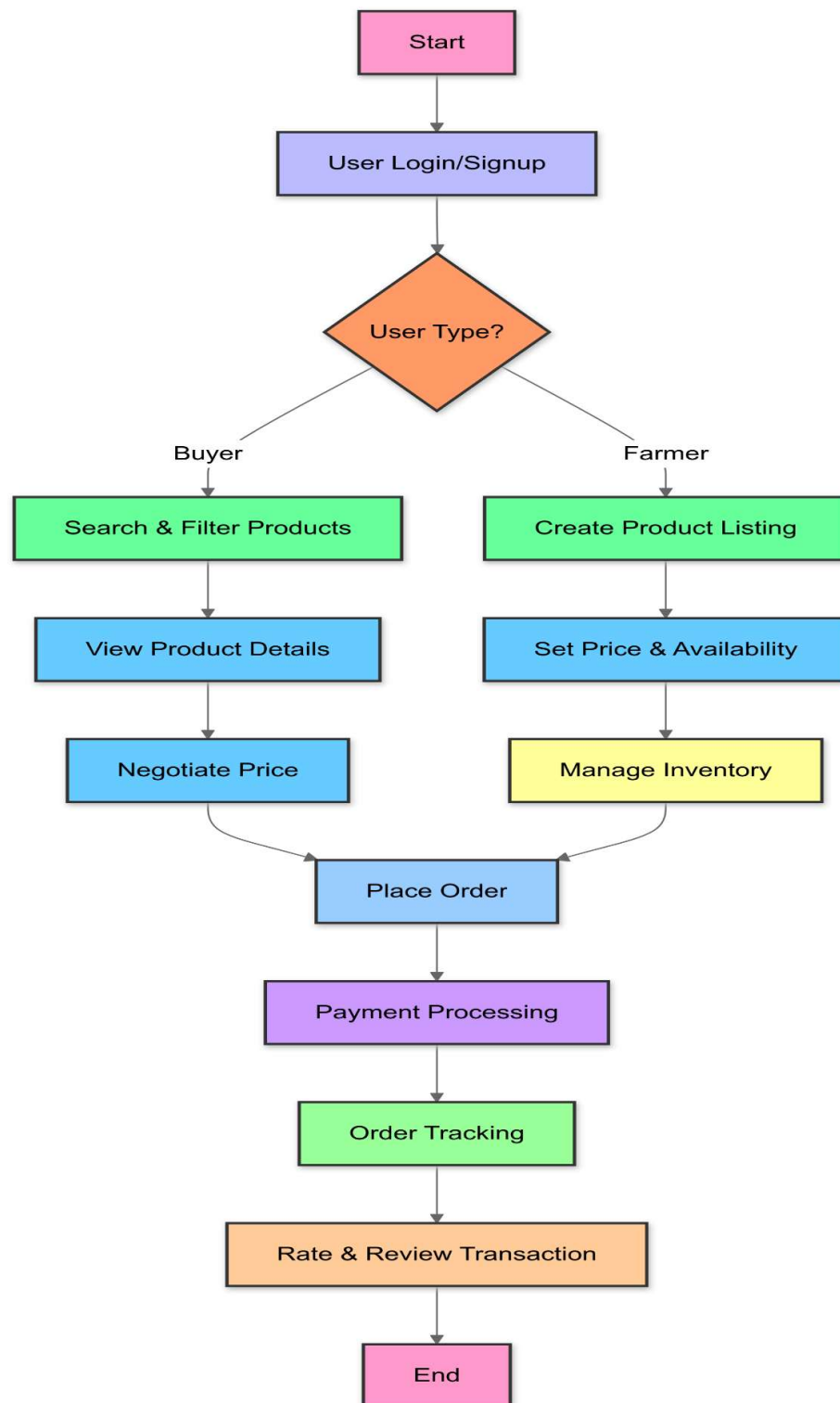
CHAPTER4

DESIGN SPECIFICATIONS

4.1 DESIGN FLOW

The design specifications for the mobile app aimed at direct farmer-customer access encompass a user-friendly interface with a clean layout, earthy color schemes, and clear typography to enhance readability. The user experience will feature a logical flow from registration to product browsing and transaction completion, with instant feedback on actions to ensure satisfaction. Key functionalities include secure user registration and login via Firebase, product listings with search and filter options, in-app messaging for negotiations, and integrated payment processing for seamless transactions. The app will be developed for Android using Kotlin, with potential cross-platform support via Flutter, while leveraging Firebase for real-time data management. Security measures will include data encryption and compliance with privacy regulations, alongside performance specifications to ensure quick load times and scalability. Accessibility standards will be met to accommodate users with disabilities, and thorough testing will be conducted to validate usability, functionality, and security. These specifications aim to create a comprehensive and engaging application that effectively connects farmers and customers.

The design flowchart serves as a visual representation of the processes and workflows involved in the mobile app for direct farmer-customer access. It outlines the sequence of steps that users and the system will follow to achieve specific tasks, such as registering, listing products, negotiating prices, and completing transactions. This flowchart is crucial for understanding the overall user journey and identifying key interactions within the app. By illustrating the flow of information and actions, it aids developers and stakeholders in grasping the structure and functionality of the application, ensuring that all components work harmoniously together. The flowchart will serve as a foundational guide during the development phase, helping to streamline implementation and improve user experience. The flowchart is shown below:



The flowchart for the user login/signup process in the direct farmer-customer access project outlines the key interactions between users (buyers and farmers) and the app's functionalities.

Flowchart Overview

1. User Login/Signup:

- Users begin by choosing to log in or sign up. The app supports two user types: buyers and farmers, ensuring tailored experiences for each.

2. User Type Selection:

- After logging in or signing up, users select their type (Buyer or Farmer), which determines the subsequent functionalities available to them.

3. Buyer Functions:

- Search & Filter Products: Buyers can search for products using keywords and apply filters (e.g., category, price) to find items that meet their needs.
- View Product Details: Upon finding a product, buyers can view detailed information, including images, descriptions, and seller information.
- Place Order: Buyers can add products to their cart and proceed to checkout.
- Payment Processing: The app facilitates secure payment processing to complete the purchase.
- Order Tracking: Buyers can track the status of their orders in real-time.
- Rate & Review Transaction: After receiving their order, buyers can rate and review their transaction, providing feedback on the product and seller.

4. Farmer Functions:

- Create Product Listing: Farmers can create and manage product listings, including setting prices and availability.
- Negotiate Price: Farmers can engage in price negotiations with buyers

through the in-app messaging system.

- Manage Inventory: Farmers can update their inventory as products are sold or restocked.

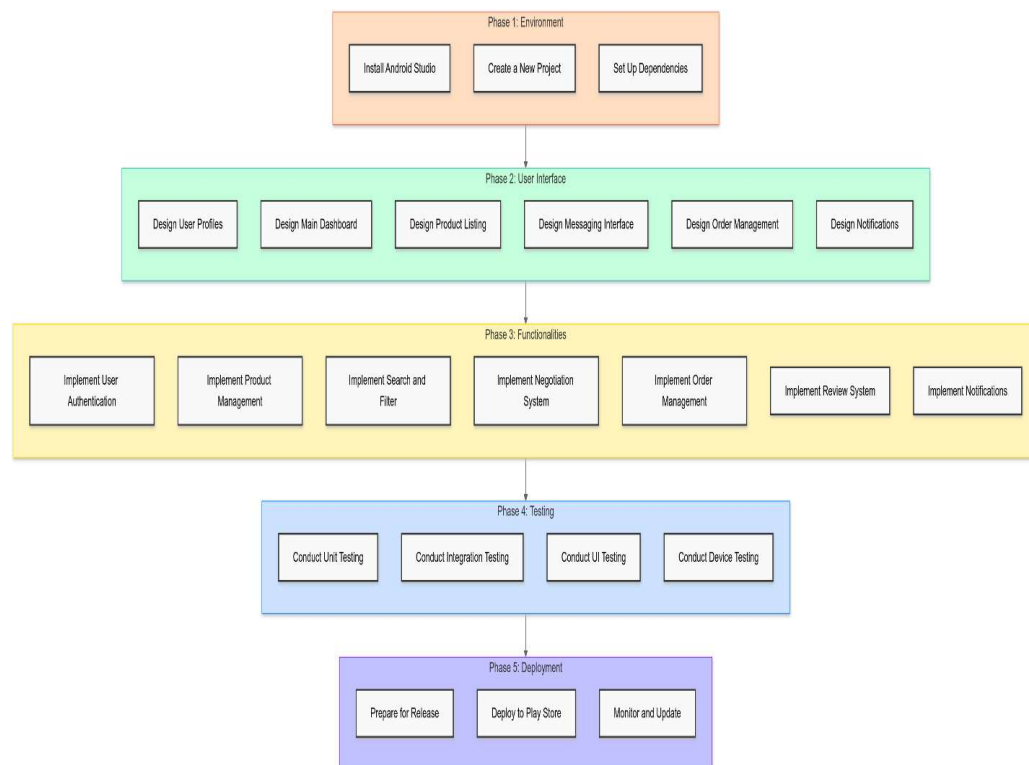
5. End:

- The process concludes once the transaction is completed, and both buyers and farmers can engage in future interactions as needed.

4.2 PHASES IN APP DEVELOPMENT

App Development typically involves several key phases which include Environment, User Interface, Functionalities, Testing and Deployment.

The phases in App Development is shown below:



PHASES IN THIS APP DEVELOPMENT

Phase 1: Environmental Setup

In the first phase of app development, focusing on the environment setup is crucial. Here's a breakdown of the subcategories

1. Install Android Studio

- Download: Go to the [official Android Studio website](https://developer.android.com/studio) and download the installer for your operating system (Windows, macOS, or Linux).
- Installation: Follow the installation prompts, ensuring to install the necessary SDK components and tools.

2. Create a New Project

- Start Android Studio: Open Android Studio after installation.
- New Project Wizard: Click on "Start a new Android Studio project."
- Select a Project Template: Choose a template that suits your app type (e.g., Empty Activity, Basic Activity).
- Configure Your Project: Enter the name, package name, save location, language (Java or Kotlin), and minimum API level.
- Finish Setup: Click "Finish" to generate the project structure.

3. Set Up Dependencies

- Open build.gradle File: Locate the build.gradle (Module: app) file in your project.
- Add Dependencies: Include any necessary libraries (e.g., Retrofit, Glide, Room) by adding them to the dependencies section.
- Sync Project: Click "Sync Now" in the notification bar to download and integrate the new dependencies.

Phase 2: User Interface Design

The second phase focuses on designing a user-friendly and visually appealing interface that enhances user experience for both farmers and customers. Key components include user profiles, main dashboard, product listing, messaging interface, order managements.

1. User Profiles

- **Farmers' Profiles:**
 - Profile picture, farm description, location, and contact information.
 - Section for product listings and customer ratings.
- **Customers' Profiles:**
 - Profile picture, purchase history, and saved preferences.
 - Option to set delivery addresses.
- **User Experience Considerations:**
 - Simple onboarding process with guided prompts.
 - Editable sections for updating information easily.

2. Main Dashboard

- **Design Elements:**
 - Clean, intuitive layout with quick access to key features (e.g., product listings, messages, orders).
 - Navigation menu for easy transitions between sections.
 - Featured products and promotions to engage users.
- **User Experience Considerations:**
 - Use of icons and visual cues for easy navigation.
 - Real-time updates on new messages and pending orders.

3. Product Listing

- **Design Elements:**
 - Grid layout for showcasing products with images, names, prices, and brief descriptions.

- Filters and search bar at the top for sorting by category, price, and distance.
- “Add to Cart” and “Negotiate Price” buttons prominently displayed.
- **User Experience Considerations:**
 - High-quality images to attract attention.
 - Clear visibility of product availability status (e.g., in stock, limited).

4. Messaging Interface

- **Design Elements:**
 - Chat interface similar to popular messaging apps.
 - Features for sending text, images, and price offers.
 - Read receipts and typing indicators for real-time interaction.
- **User Experience Considerations:**
 - Easy-to-use input field with quick access to attachments.
 - Notifications for new messages.

5. Order Management

- **Design Elements:**
 - List view of current and past orders with status indicators (e.g., pending, completed).
 - Detailed view for each order, including product details, delivery options, and payment status.
 - Buttons for canceling or reordering past purchases.
- **User Experience Considerations:**
 - Intuitive layout for quick access to order information.
 - Clear action buttons to facilitate easy management.

6. Notifications

- **Design Elements:**
 - Notification center accessible from the main dashboard.
 - Alerts for new messages, price offers, order status changes, and promotional deals.
 - Option for users to customize notification preferences.
- **User Experience Considerations:**
 - Use of badges and pop-up notifications for immediate attention.
 - Clear categorization of notifications (e.g., messages, orders, promotions)

Phase 3: Functionality Implementation

In this phase, we will implement key functionalities that enhance the user experience and operational efficiency of the mobile app. Each functionality is crucial for ensuring smooth interactions between farmers and customers.

1. User Authentication

- **Functionality:**
 - Implement secure user registration and login processes for both farmers and customers.
 - Options for authentication via email, phone number, and social media accounts (e.g., Google, Facebook).
 - Password recovery and two-factor authentication for enhanced security.
- **Technical Considerations:**
 - Use OAuth for social logins.
 - Store passwords securely using encryption.

2. Product Management

- **Functionality:**
 - Farmers can create, edit, and delete product listings.
 - Upload images, descriptions, and set prices.
 - Inventory tracking to update availability in real-time.
- **Technical Considerations:**
 - Use a cloud database for product information storage.
 - Implement user-friendly forms for easy product entry.

3. Search and Filter

- **Functionality:**
 - Enable customers to search for products using keywords.
 - Implement filters for sorting products by category, price range, location, and availability.
- **Technical Considerations:**
 - Use indexing techniques in the database to optimize search performance.
 - Design an intuitive filter interface for ease of use.

4. Negotiation System

- **Functionality:**
 - Allow customers to make offers on products directly through the app.
 - Farmers can respond with acceptance, counter-offers, or rejection.
 - Real-time notifications to alert users about negotiation status.
- **Technical Considerations:**
 - Develop a messaging protocol for real-time communication.
 - Maintain a negotiation history for reference.

5. Order Management

- **Functionality:**
 - Enable customers to place orders directly from product listings.
 - Track order status (e.g., pending, shipped, completed) and provide updates.
 - Allow users to cancel or modify orders before shipment.
- **Technical Considerations:**
 - Implement a robust order processing system.
 - Use state management to handle order statuses.

6. Review System

- **Functionality:**
 - Customers can leave reviews and ratings for farmers after transactions.
 - Display aggregated ratings on farmer profiles for transparency.
- **Technical Considerations:**
 - Create a database schema to store reviews and ratings.
 - Implement moderation features to handle inappropriate content.

7. Notifications

- **Functionality:**
 - Send push notifications for new messages, order updates, and promotional offers.
 - Allow users to customize their notification preferences.
- **Technical Considerations:**
 - Use a push notification service (e.g., Firebase Cloud Messaging) for real-time alerts.

Phase 4: Testing

In this phase, we will conduct thorough testing to ensure that the app functions as intended and provides a seamless user experience. This includes unit testing, integration testing, UI testing, and device testing.

1. Conduct Unit Testing

- **Objective:** Verify that individual components and functions perform correctly in isolation.
- **Approach:**
 - Write automated test cases for each module (e.g., user authentication, product management, negotiation system).
 - Use testing frameworks such as Jest or Mocha for JavaScript/React Native.

2. Conduct Integration Testing

- **Objective:** Ensure that different components of the app work together as expected.
- **Approach:**
 - Test interactions between modules, such as user authentication affecting product management.
 - Use integration testing tools like Cypress or Postman for API testing.

3. Conduct UI Testing

- **Objective:** Ensure the user interface functions correctly and provides a good user experience.
- **Approach:**
 - Perform manual testing to evaluate the layout, design, and usability of the app.
 - Use automated UI testing tools like Selenium or Appium to test interactions.

4. Conduct Device Testing

- **Objective:** Ensure the app works seamlessly across different devices and operating systems.
- **Approach:**
 - Test the app on a range of devices (smartphones and tablets) with varying specifications.
 - Utilize device cloud services like BrowserStack or Sauce Labs for broader coverage.

Phase 5 :Deployment

1. Prepare for Release

- **Final Testing**
 - Conduct thorough testing, including functional, usability, and performance testing.
 - Address any bugs or issues found during testing.
- **Review Feedback**
 - Incorporate feedback from beta testers to refine features and user experience.
- **Version Control**
 - Update version numbers in your app's configuration (e.g., increment version code).
- **Create Release Notes**
 - Document all new features, bug fixes, and improvements to inform users.
- **Compliance Check**
 - Ensure compliance with Play Store policies and guidelines.

2. Deploy to Play Store

- **Build APK/AAB**
 - Generate the final APK or AAB (Android App Bundle) for submission.
- **Google Play Console Setup**
 - Log in to the Google Play Console and select your app.
- **Upload APK/AAB**
 - Upload the build file and confirm it meets Play Store requirements.
- **Store Listing**
 - Fill out the app listing, including:
 - App name and description
 - Screenshots and promotional graphics
 - Category and content rating
- **Pricing and Distribution**
 - Set the app's pricing model (free or paid) and choose the distribution regions.
- **Submit for Review**
 - Once everything is complete, submit the app for review by Google.

3. Monitor Post-Deployment

- **Track Performance**
 - Use Google Play Console analytics to monitor downloads, user engagement, and crash reports.
- **User Feedback**
 - Actively check reviews and ratings to gather user insights and identify areas for improvement.
- **Monitor App Health**
 - Utilize tools like Firebase Crashlytics to monitor app crashes and errors.

4. Update and Iterate

- **Address Issues**
 - Quickly fix critical bugs or issues reported by users post-launch.
- **Plan Regular Updates**
 - Based on user feedback and analytics, plan updates to enhance features and performance.
- **User Communication**
 - Keep users informed about updates, new features, and fixes through in-app notifications and release notes.

CHAPTER5

METHODOLOGY

5.1 User Roles and Flow

- **Farmers (Seller):**
 - **Primary Role:** List agricultural products, manage inventory, negotiate prices, and handle transactions.
 - **Responsibilities:** Upload product details, manage pricing, and communicate with customers directly.
- **Customers (Buyers):**
 - **Primary Role:** Browse listed products, negotiate prices, and make purchases.
 - **Responsibilities:** Search for products, make price offers, communicate with farmers, and complete transactions.
- **Retailers (Buyers/Resellers):**
 - **Primary Role:** Purchase produce in bulk for resale, negotiate prices, and complete transactions.
 - **Responsibilities:** Browse bulk product listings, negotiate prices with farmers, and finalize deals.
- **Admin:**
 - **Primary Role:** Manage platform operations, including product verification, user account management, and monitoring transactions.
 - **Responsibilities:** Review products, manage user accounts, and ensure the app runs smoothly.

5.2 User Registration and Login

1. Farmer / Customer / Retailer:

- **Step 1:** Users (Farmers, Customers, Retailers) create an account by providing basic information (e.g., Name, Email, Contact Info, Location, etc.).
- **Step 2:** Users log in to the app using their credentials or through social media authentication (Google, Facebook, etc.).

Role-Specific Access:

- **Farmers:** Access product listing and sales-related features.
- **Customers/Retailers:** Access product browsing and price negotiation features.
- **Admin:** Access to the entire system, including product validation and user management.

5.3 Product Listing by Farmers

2. Farmer (Seller):

- **Step 3:** After logging in, farmers can add new products by providing details:
 - Product name
 - Quantity
 - Price (initial price)
 - Description
 - Photos of the produce
 - Delivery details (location, delivery options)

Features:

- Farmers can set initial prices and negotiate them with buyers through the app.

- Farmers can update, delete, or edit listings as needed.

5.4 Product Browsing and Search by Buyers (Customer/Retailer)

3. Customer / Retailer (Buyer):

- **Step 4:** After logging in, customers or retailers browse through listed products.
 - Users can filter by categories, price range, location, and product type.
 - Search for specific products (e.g., tomatoes, potatoes, etc.).
 - View product details, including descriptions and images.

Features:

- Customers and retailers can add products to their cart and initiate price negotiations.
- Price negotiation option allows buyers to offer a price below the listed price.

5.5 Price Negotiation and Communication

4. Farmer (Seller) and Customer / Retailer (Buyer):

- **Step 5:** The negotiation feature allows customers/retailers to make offers to the farmers, who can accept, reject, or counter the offer.
 - The farmer gets a notification when a price offer is made and can respond with a counteroffer.
 - Communication tools (chat, call) allow buyers and farmers to discuss further terms, delivery details, etc.

Features:

- Real-time messaging and/or call functionality between the buyer and seller.
- Both buyers and sellers can track the negotiation history.

- Farmers can set minimum acceptable prices to avoid lowball offers.

5.6 Payment System and Transaction Handling

5. Customer / Retailer (Buyer) and Farmer (Seller):

- **Step 6:** Once the price is agreed upon, the buyer can proceed with the payment via a secure payment gateway integrated into the app.
 - Multiple payment options (credit/debit card, digital wallets, UPI, etc.) are provided.
 - Payment confirmation is sent to both parties once the transaction is completed.

Features:

- Secure, encrypted payment system for both buyers and sellers.
- Transaction history for users to track payments and sales.
- Option for escrow payments, where the payment is held until the buyer receives the produce.

5.7 Delivery and Fulfillment

6. Farmer (Seller) and Customer / Retailer (Buyer):

- **Step 7:** After payment, the delivery process is initiated. Farmers can provide delivery options such as:
 - Direct delivery by the farmer.
 - Third-party logistics (local delivery services).
- Buyers can track delivery status within the app.

Features:

- Delivery tracking feature allows both parties to know the status of the product.

- Farmers can update delivery status (e.g., "Shipped," "Out for delivery," "Delivered").

5.8 Feedback and Ratings

7. Customer / Retailer (Buyer) and Farmer (Seller):

- **Step 8:** After the transaction is complete, both the farmer and the buyer are encouraged to rate and provide feedback about the transaction.
 - Farmers rate buyers based on their reliability and payment.
 - Buyers rate farmers based on product quality and delivery.

Features:

- Rating and review system for both buyers and sellers.
- Feedback helps improve transparency and trust within the platform.
- Higher ratings improve visibility of farmers and buyers.

5.9 Admin Role and Management

8. Admin:

- **Step 9:** Admins have access to the backend system to:
 - Verify product listings to ensure compliance with quality standards.
 - Monitor transactions for any fraudulent activity.
 - Manage user accounts (suspend/block users, handle disputes).
 - Ensure secure functioning of the payment gateway and delivery systems.

Features:

- Admins can manage user data and product listings.
- Admins can send push notifications or alerts to users.
- Access to reports on app performance, user activity, financial transaction

CHAPTER 6

RESULT ANALYSIS

6.1 EXISTING SYSTEMS

- **Reliance on Intermediaries:** The current agricultural market system heavily relies on intermediaries (e.g., wholesalers, traders) who purchase produce from farmers at low prices and resell it at higher prices to consumers, reducing farmers' profits.
- **Limited Market Access:** Farmers, particularly those in rural areas, have limited access to broader markets and struggle to reach consumers directly, which often results in low sales and wastage of unsold produce.
- **Lack of Price Transparency:** Farmers often do not have access to real-time pricing information, making it difficult for them to set competitive prices or negotiate fair deals with buyers.
- **Inefficient Supply Chain:** The agricultural supply chain is often inefficient, with produce being passed through several hands before reaching consumers. This increases costs, leads to delays, and can result in spoilage.
- **Poor Logistics and Delivery Systems:** There is often a lack of proper logistics infrastructure to facilitate timely delivery of produce from farmers to customers, leading to delays, spoilage, and higher transportation costs.
- **Manual Transactions:** Payments between farmers and buyers are typically handled manually, which can lead to delays, issues with payment security, and lack of transparency

6.1.1 DISADVANTAGES

- **Dependency on Intermediaries:** The existing system forces farmers to rely on intermediaries, reducing their profits and limiting direct access to consumers, which creates a less transparent pricing structure.
- **Limited Market Reach:** Farmers in rural areas have minimal access to larger markets and face difficulties reaching consumers beyond their local communities, limiting their sales opportunities.
- **Lack of Price Control:** Farmers often have little control over the prices of their products, as prices are determined by intermediaries and external market factors, leading to lower earnings.

6.2 PROPOSED SYSTEM

- **Direct Farmer-Customer Connection:** The app eliminates intermediaries by enabling direct transactions between farmers and customers, allowing farmers to receive better prices for their produce.
- **Real-Time Price Transparency:** The system provides real-time market prices and trends, helping farmers set competitive prices and make informed decisions.
- **Efficient Supply Chain and Logistics:** The app facilitates order and delivery tracking, improving supply chain efficiency and reducing delays, spoilage, and wastage of perishable goods.
- **Secure Payment Integration:** The app incorporates secure payment gateways, ensuring transparent and safe transactions between farmers and customers.
- **Weather and Agricultural Advisory:** The app provides location-based weather updates and farming tips, supporting farmers with valuable information to optimize their crop management and productivity.

6.2.1 ADVANTAGES

- **Direct Access to Market:** Farmers can sell their produce directly to customers, bypassing intermediaries and ensuring better profits.
- **Wider Customer Reach:** The app expands market access, allowing farmers to connect with a larger customer base, including local buyers, retailers, and

wholesalers.

- **Real-Time Pricing and Transparency:** The app provides real-time market prices, allowing farmers to set competitive and fair prices based on current trends.
- **Efficient Logistics and Order Tracking:** The system improves supply chain efficiency with real-time order and delivery tracking, reducing delays, spoilage, and wastage.
- **Secure Payments and Trust Building:** The app integrates secure payment gateways, ensuring safe transactions and fostering trust between farmers and buyers through a rating and review system.

CHAPTER 7

CONCLUSION

- **Direct Connection:** Enables direct transactions between farmers and customers, eliminating intermediaries for better pricing.
- **Product Management:** Farmers can list, update, and manage their products easily, while customers can browse and place orders.
- **Secure Payments:** Integration of secure payment gateways (e.g., Stripe, Razorpay) for safe and transparent transactions.
- **Order Tracking:** Real-time order and delivery tracking for both farmers and customers, ensuring timely and efficient deliveries.
- **Hhow hh** Provides farmers with weather updates and farming tips, improving their productivity and decision-making.

CHAPTER 8

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