

# AgriFarma: Farmers' Digital Hub System Documentation

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# **Abstract**

AgriFarma is a digital platform designed to be a one-stop portal for farmers in Sindh, Pakistan, providing resources for agricultural knowledge, expert consultation, community collaboration, and a marketplace for agricultural commerce. This document serves as both a comprehensive **User Guide** for navigating the platform's features and a **Technical Overview** detailing the system architecture, technology stack, and functional modules. The goal is to maximize the utility and longevity of the AgriFarma platform.

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# Chapter 1

## Introduction

### 1.1 Purpose of AgriFarma

The primary objective of AgriFarma is to bridge the information gap faced by farmers by offering a centralized digital space where they can:

- Gain up-to-date \*\*agricultural knowledge\*\* and best practices.
- Connect directly with certified \*\*consultants and experts\*\*.
- Share \*\*success stories\*\* and peer-to-peer advice.
- Facilitate the \*\*buying and selling\*\* of agricultural products (E-Commerce).

### 1.2 Target Users

The platform is built to serve a diverse user base, each with specific roles and needs:

- **Farmers:** The primary users, seeking knowledge, community, and a marketplace to sell their produce.
  - **Consultants / Experts:** Individuals offering specialized knowledge in areas like soil health, irrigation, or pest management.
  - **Academics / Students:** Users contributing research and educational content to the Knowledge Base.
  - **Buyers / Sellers:** General users participating in the Agri Marketplace for commerce.
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# Chapter 2

## Detailed User Guide: Utilizing AgriFarma

This chapter provides detailed, step-by-step instructions for all users to effectively utilize the core features of the AgriFarma platform.

### 2.1 Getting Started: Registration and Profile Management

#### 1. Account Creation and Login

1. **Registration:** Click the 'Register' link on the homepage. Fill in the required fields: Name, Email, Mobile, and Location (City, State, Country).
2. **Expertise Level:** Select your current level of agricultural expertise: **Beginner, Intermediate, or Expert.** This helps tailor your content experience.
3. **Login:** After registration, or on subsequent visits, use your registered Email and Password to access the platform.

#### 2. Managing Your Profile

Your personal dashboard is where you track your activity and update your details.

1. **Access:** Click on your name or profile picture icon (usually in the top right corner).
2. **Information Displayed:** View your join date, the number of posts you've made, the likes received, and a feed of your latest posts.
3. **Editing:** Use the 'Edit Profile' button to change your Name, Location, Profession, Expertise Level, or Profile Picture. You can also update your password securely in this section.

### 2.2 Community and Learning Features

#### 1. Discussion Forum

The forum allows for collaborative problem-solving based on categories and subcategories.

1. **Browsing:** Navigate to the 'Forum' tab. You will see main categories (e.g., Crops) which expand into subcategories (e.g., Wheat, Rice).

2. **Searching:** Use the global search bar or the dedicated forum search to quickly find threads related to specific issues (e.g., "rust disease"). The latest discussions are always visible in the sidebar.

3. **Starting a New Discussion:**

- Select the most relevant Category and Subcategory.
- Click 'Start New Discussion'.
- Enter a concise, clear Title and write your detailed question or comment in the body.
- Click 'Post'.

4. **Posting a Reply:** Open any thread and use the 'Post Reply' text box at the bottom to contribute your advice or ask a follow-up question.

## 2. Knowledge Base (Blogs)

This is the repository for high-quality, reviewed content.

1. **Reading:** Articles are categorized into sections like 'Success Stories', 'Techniques', and 'Weather Tips'. Click on a category or an article title to read the full content.

2. **Commenting:** Share your thoughts or feedback using the commenting system beneath each blog post.

3. **Contributing Content (Academics/Experts):**

- Click 'Submit Blog Post'.
- Upload multimedia content (images, video links, PPT/document files) to enrich your article.
- **Approval Required:** Submitted content is reviewed by the Admin team for accuracy and appropriateness before being published live.

## 2.3 Expert Connectivity: Consultancy Services

### 1. Finding and Contacting an Expert

1. **Directory:** Navigate to the 'Consultancy' section. You can view a directory of approved experts.

2. **Filter:** Consultants are listed by their area of expertise (e.g., Soil Health, Irrigation Methods, Crop Disease Diagnosis). Filter the list to find the specialist you need.

3. **Contact:** Click the consultant's name to view their full profile and contact details. Use the integrated 'Contact via Message' form or the provided email address to initiate a consultation.

### 2. Registering as a Consultant

1. **Application:** Complete the special Consultant Registration form, providing details on your qualifications, relevant experience, and specific categories of expertise.

2. **Admin Review:** Your application is sent for Admin review. The Admin will verify your credentials and approve your profile for public listing.

3. **Public Listing:** Once approved, your profile will appear in the Consultancy Directory, and users can begin contacting you.

## 2.4 E-Commerce: The Agri Marketplace

### 1. Buying Products

1. **Browse/Search:** Navigate to the 'Agri Marketplace'. Use the search and filtering options to find specific products (e.g., seeds, equipment, or fresh produce).
2. **Shopping Cart:**
  - Click 'Add to Cart' on the product page.
  - View your cart by clicking the cart icon. You can edit quantities or remove items here.
3. **Checkout:** Proceed to checkout. Follow the prompts to enter shipping information, select a payment method, and confirm the order.
4. **Order History:** Track the status of your current and past orders in your user dashboard.

### 2. Selling Products (Farmers)

Farmers can list their produce directly on the platform.

1. **Listing:** Click 'Post Item for Sale' (available to approved Farmer/Seller roles).
2. **Details:** Provide the Product Name, Price, Category, and a detailed Description.
3. **Images:** Upload clear images of the product.
4. **Inventory:** Specify the available quantity.
5. **Management:** Once posted, you can view and manage your product listings, including updating inventory or prices, via your seller dashboard.

[Image of E-commerce website product listing page with shopping cart and product details]

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# Chapter 3

## Technical Overview

### 3.1 System Architecture and Modules

AgriFarma is built using a modular structure to ensure maintainability and scalability. The system is divided into six major functional modules that interact with shared data resources.

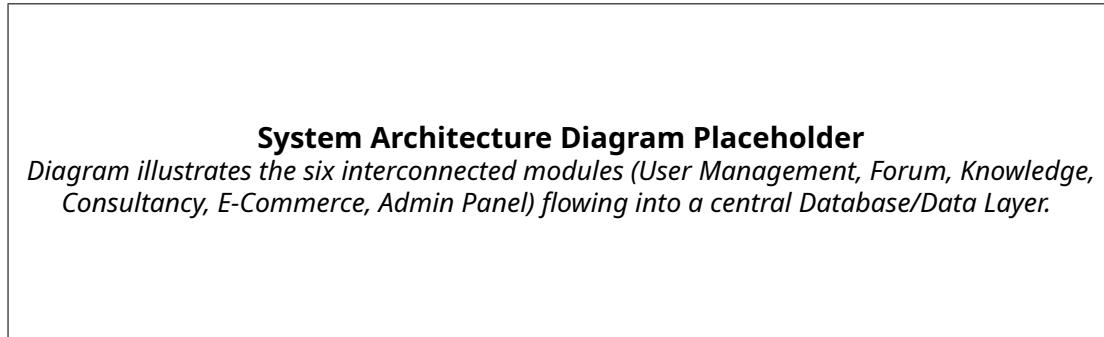


Figure 3.1: Conceptual Overview of the AgriFarma Functional Modules.

[Image of AgriFarma System Architecture Diagram with Modules]

### 3.2 Technology Stack

The platform is developed using a robust and flexible technology stack:

Table 3.1: Technology Stack Breakdown

Layer	Technology
Backend (Web Framework)	<b>Flask</b> (Python)
Frontend (User Interface)	<b>HTML5, CSS3, Bootstrap</b>
Database	<b>SQLite</b> (Development) / <b>MySQL</b> (Production)
Authentication	<b>Flask-Login, Werkzeug</b> (Password Hashing)
Data Handling / Reports	<b>Pandas, CSV, JSON</b>
Visualization (Analytics)	<b>Chart.js / Plotly</b>
Deployment	<b>Render / PythonAnywhere</b>

### 3.3 Functional Modules Summary

- **User Management:** Handles user registration, login, role assignment (Admin, User, Consultant), and profile updates.
- **Forum Module:** Manages creation, retrieval, and searching of category-based discussion threads and replies.
- **Knowledge Module:** Facilitates the posting, searching, and viewing of blog content with multimedia support and commenting systems.
- **Consultancy Module:** Maintains consultant profiles and provides an Admin-driven approval mechanism before profiles are made public.
- **E-Commerce Module:** Core features for product listings, shopping cart management, order processing, and payment/shipping options.
- **Admin Panel:** Centralized control for managing users, moderating content, adding products, and generating sales/inventory reports.

### 3.4 Project Folder Structure

The following structure ensures logical separation of concerns, typical of a well-organized Flask application.

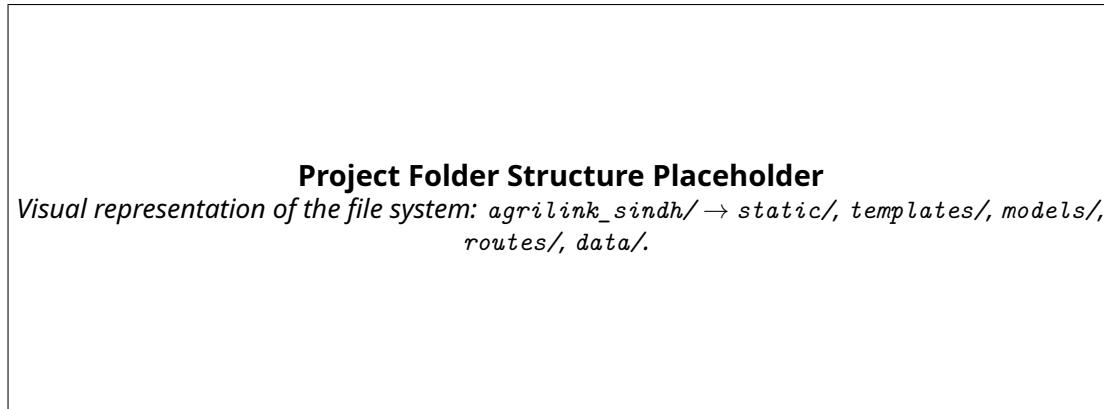


Figure 3.2: AgriFarma Project Folder Structure.

1. `app.py, config.py, requirements.txt`: Core application files, configuration, and dependencies.
2. `static/`: Contains front-end assets (CSS, JS, Uploads).
3. `templates/`: Stores all HTML files for rendering the user interface.
4. `models/`: Contains Python classes defining data structures (e.g., `user_model.py`).
5. `routes/`: Holds logical groups of URL handlers (e.g., `auth_routes.py, shop_routes.py`).
6. `data/`: Stores non-database data like `products.csv` and `blog_data.json`.

### 3.5 Project Roadmap Summary

The project was executed across five key days/milestones:

1. **Setup & User Authentication:** Flask foundation, database setup, and secure register/login module.
2. **Discussion Forum & Knowledge Base:** Implementation of community posts, replies, and content submission/moderation.
3. **Consultancy & Profile Module:** Consultant registration, admin approval, and detailed user profiles.
4. **E-Commerce Module:** Product listings, shopping cart, and order management.
5. **Admin Panel, Reports & Testing:** Final integration, creation of sales/inventory reports (Pandas), and final polish.