Empowering Local Agriculture: The Organic Option

E-Commerce Platform

The project "Empowering Local Agriculture: The Organic Option E-Commerce Platform" aims to revolutionize the traditional agricultural supply chain by directly connecting local farmers, customers, and delivery riders. This platform empowers farmers to manage their own shops, sell products online without intermediaries, and receive fair prices, while providing customers with fresh, locally produce organic products at reasonable prices. Riders benefit from streamlined delivery opportunities, enhancing their earning potential.

Key features include time-based inventory management to reduce post-harvest waste, local shop discovery for customers, and educational resources for farmers on best practices and market trends. The platform used to build modern technologies like ASP.NET Core, C#, Entity Framework, Razor Pages, Bootstrap, and Microsoft SQL Server to deliver a smooth, user-friendly experience. By focusing on digital transformation, the platform improves traditional f farming practices, and strengthens rural economies through direct-to-consumer sales. This project addresses critical issues in the agriculture sector, such as middlemen, crop wastage, and inefficient pricing, creating a more user-friendly and profitable ecosystem for farmers, riders, and customer

Project Plan Schedule:

To Develop proposed system, we create a microscopic task plan where each phase is breaking down different part and iterative development approach follow to develop design system. We create schedule for 6 months for planning to deployment,

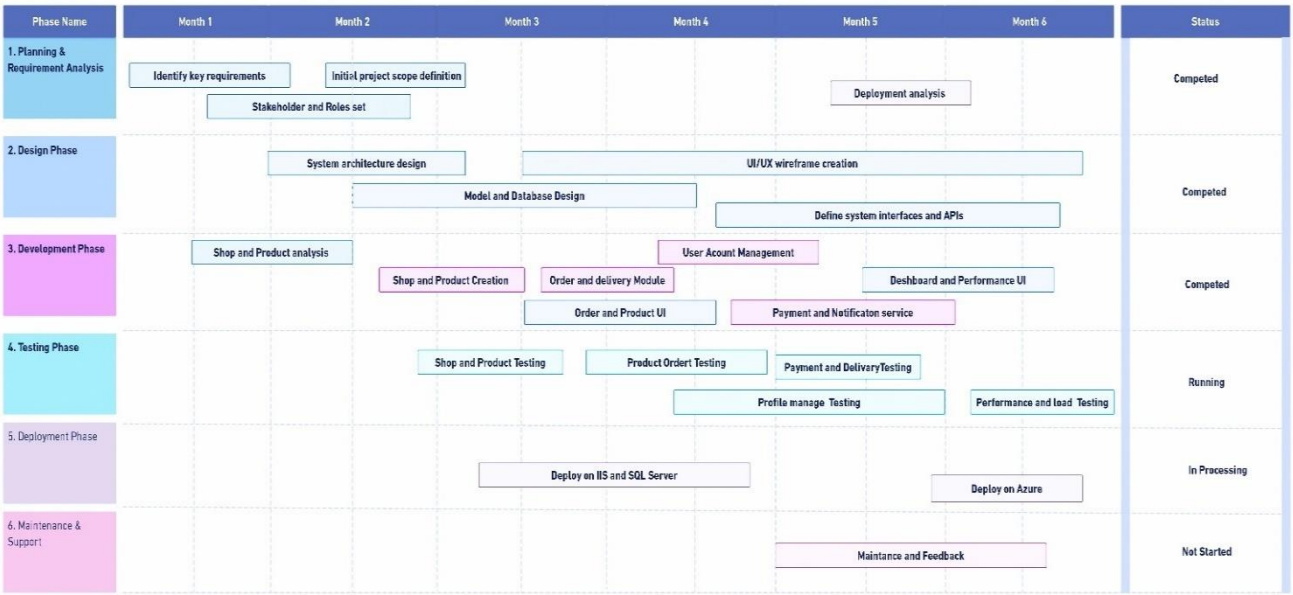


Table 3.3: Project development schedule

3.4 Development Approach

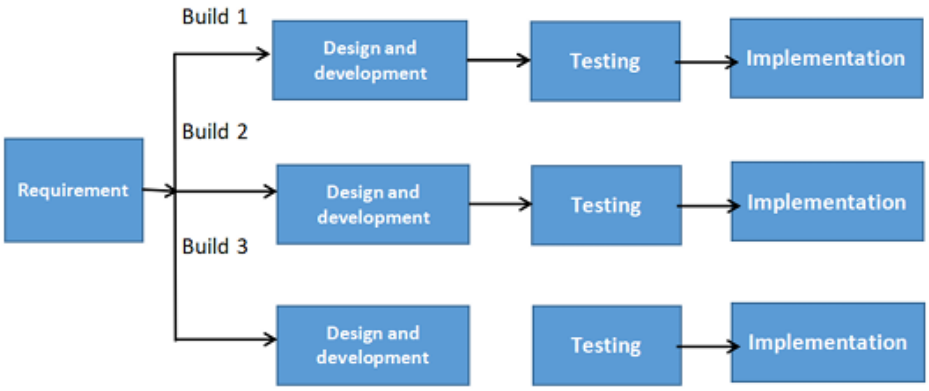


Figure 3.4: Iterative Development Approach Model

The iterative development approach employed for the "Organic Option" project is a dynamic and flexible methodology that emphasizes continual refinement throughout the software development life cycle. The collaborative development environment promotes effective communication among team members. This gives industry standards and best practices of software development. Each iteration concludes with release planning, evaluating progress and

prioritizing features for the next phase. Embracing a culture of continuous improvement, this iterative model facilitates an agile and responsive development process for the project.

3.4.1 Version Control: Git and GitHub for Version Control and Collaboration. This offers efficient project management and stay focus on Code quality and simplicity.

3.4.2 Communication: To communicate with team members we use Google meet, WhatsApp messenger and Google Mail service.

3.5 Functional Requirements

In creating a dynamic and user-friendly platform, the project includes several important features that make it functional and efficient for different users. These are directly related to the goals of the Organic Option platform.

ID	Requirement Description	Category	Priority	Roles
FR-01	User profile and account Management	User Management	High	User,
FR-02	Shop Management for Farmers	Shop/Inventory Management	High	Farmer, Admin
FR-03	Delivery Operations	Delivery Management	Medium	Rider
FR-04	Administrative Tools	Platform Management	High	Admin
FR-05	Product and Order Tracking	Order Management	High	Customer, Farmer
FR-06	Multi-Payment Methods	Payment Integration	High	Customer, Admin
FR-07	Reporting and Analytics	Sales and Performance Reports	Medium	Admin
FR-08	Notification System	Communication	Medium	Customer
FR-09	Authentication and Authentication	User Managements	High	All User
FR-10	Inventory System	Shop Inventory	High	Farmer
FR-11	Farmer Educative, Product price	Blog Manages	Medium	Customer Farmer Admin
FR-12	Shop Review and Feedback	Review and Rating	Medium	Customer
FR-13	Shop Order Management	Shop management	High	Farmer, Admin

Table 3.5.1: Functional Requirement analysis

Highly recommend module and functionality are elected for functional requirements so that system meet this requirement and bring desire goal. The's will add functional requirement during design and development phases.

3.6 Non-Functional Requirements

The 'Organic Options' platform must meet several non-functional requirements to ensure smooth, secure, and reliable operation for all users.

ID	Requirement Description	Category	Priority	Notes
NFR-01	Performance	System Performance	High	Performance can't be compromised
NFR-02	Security	Data Security	High	Can't be compromised
NFR-03	Scalability	System Scalability	Medium	System may increase Large number of user
NFR-04	Usability	User Experience	High	Need to be user friendly
NFR-05	Mobile Responsiveness	Platform Availability	High	Supports multiple screens for better use
NFR-06	Availability	Uptime	High	24/7 active with load
NFR-07	Data Integrity	Data Management	Medium	Can compromise
NFR-08	Support and Help Features	User Assistance	Medium	User feedback for better quality and improvements

Table 3.5.2: Non-Functional Requirement Analysis

3.6 Stakeholder and User Role:

To build E-commerce Platform we define many roles as like

Unregistered User: A person who has not signed up or logged into the system yet.

Customer: A registered user who can browse, order, and pay for products.

Farmer: The seller of the products, who manages the shop and orders.

Rider: The delivery person who delivers the products to the customer.

Admin: The person who manages the system, users, and financial transactions**.**

SuperAdmin: The person who manages the system, and all Admin**.**

3.6.1 Use Case Diagrams:

Use case diagrams give the interactions between users and the system. The following describes how each user role interacts with the system to carry out particular tasks:

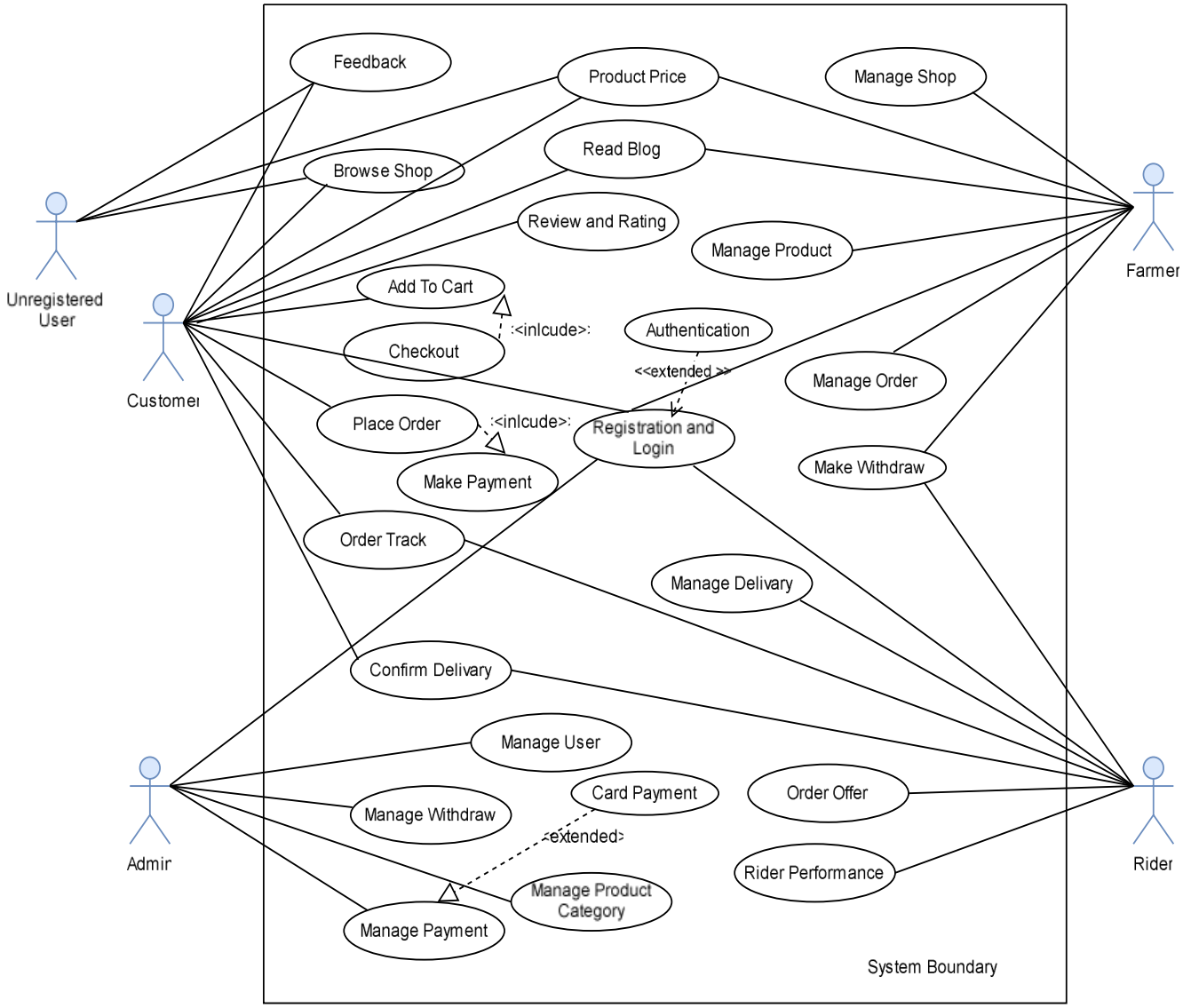


Figure 3.6.1: Use case Diagram

Sequence Diagram

The Sequence diagram serves as a visual representation of the flow of data within the "Organic Option" system. This diagram illustrates how data moves through various processes, entities, and interactions, providing a clear depiction of the system's data handling.

User (Consumer) Site:

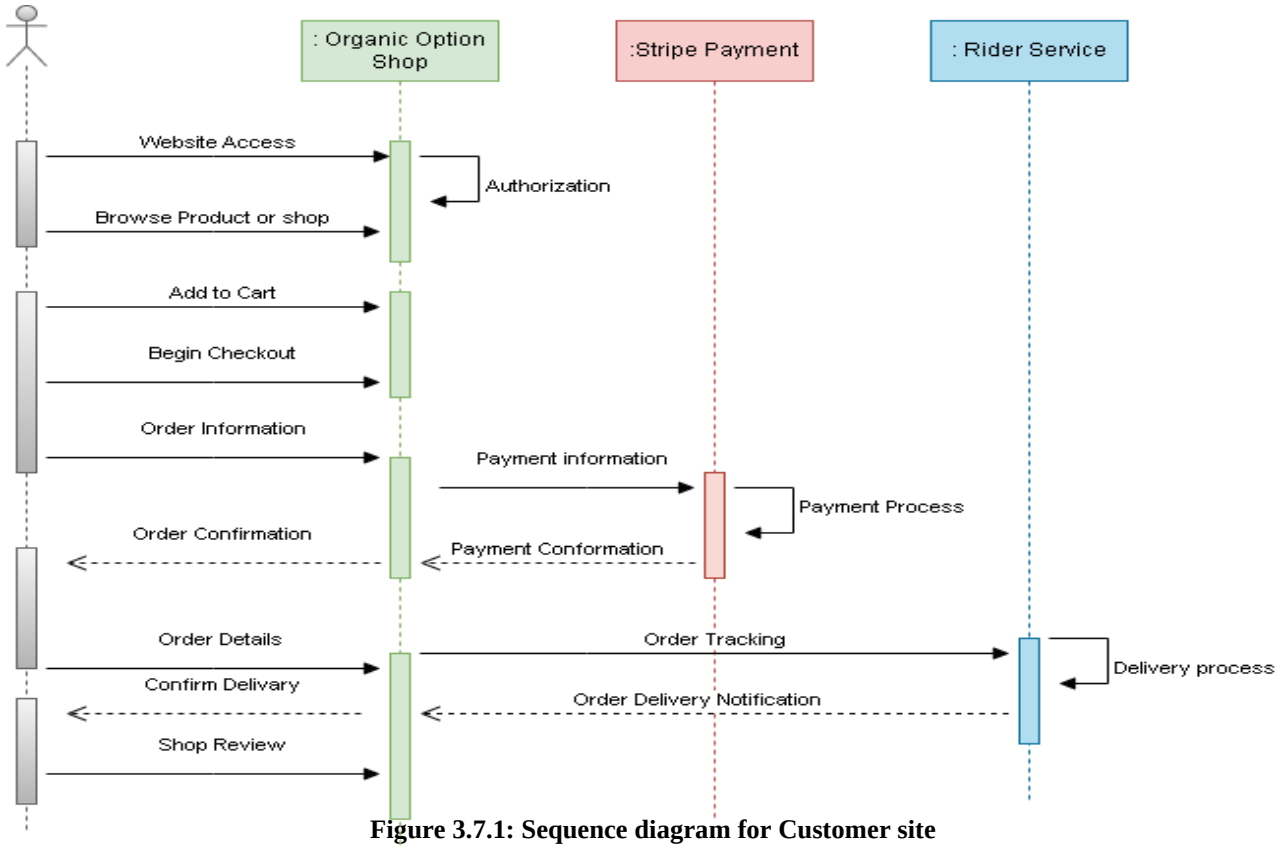


Figure 3.7.1: Sequence diagram for Customer site

3.7.2 Farmer Site:

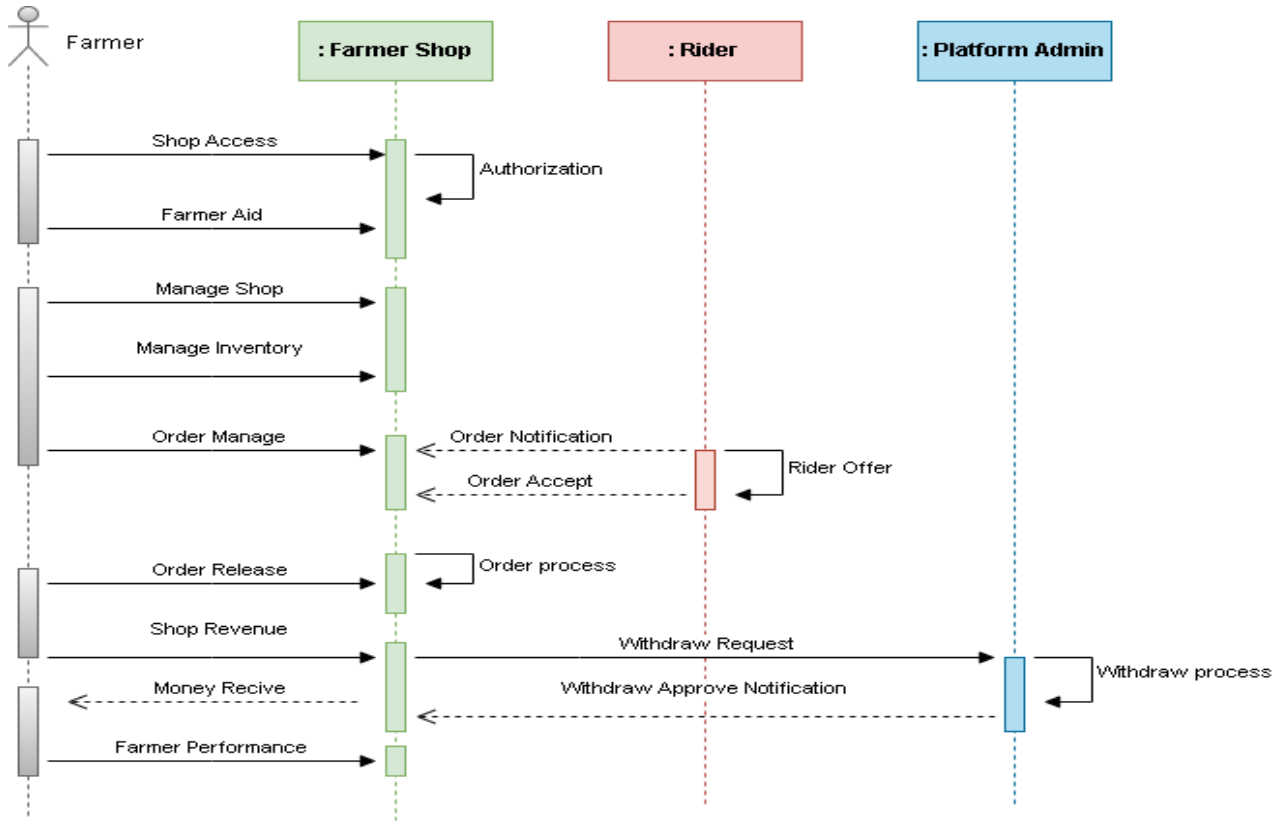


Figure 3.7.2: Sequence diagram for farmer site

3.7.3 Rider (Delivery) Site:

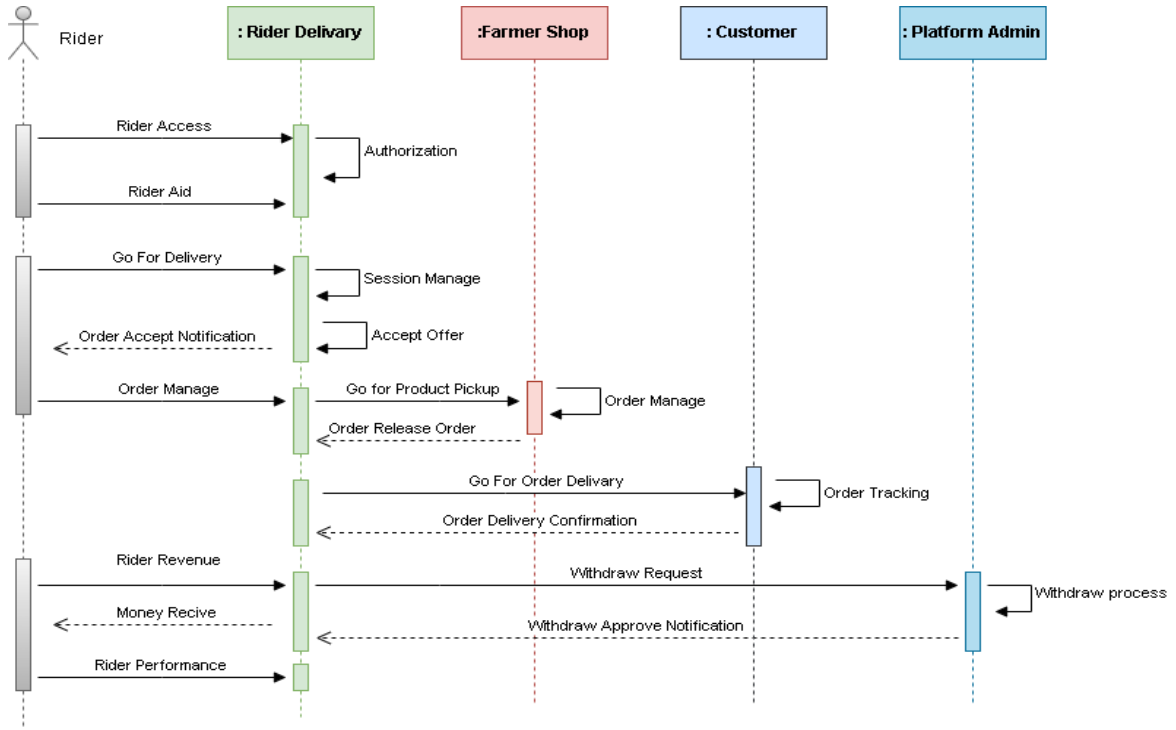


Figure 3.7.3: Sequence diagram for Rider's site

System Architecture

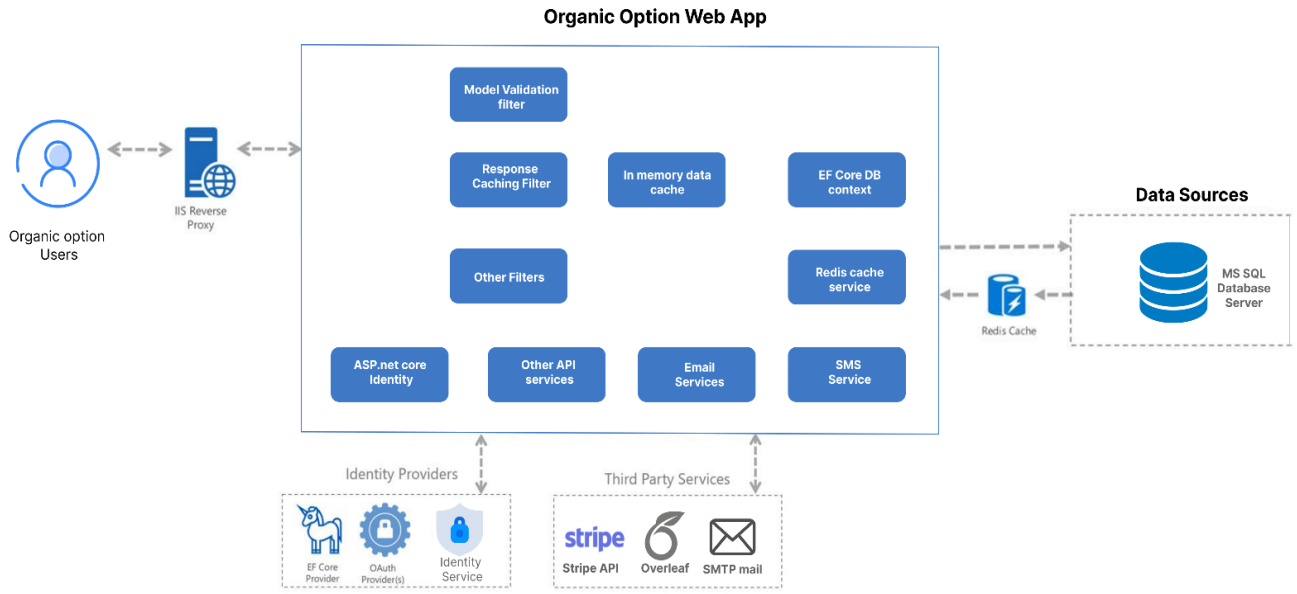


Figure 4.1: System Architecture

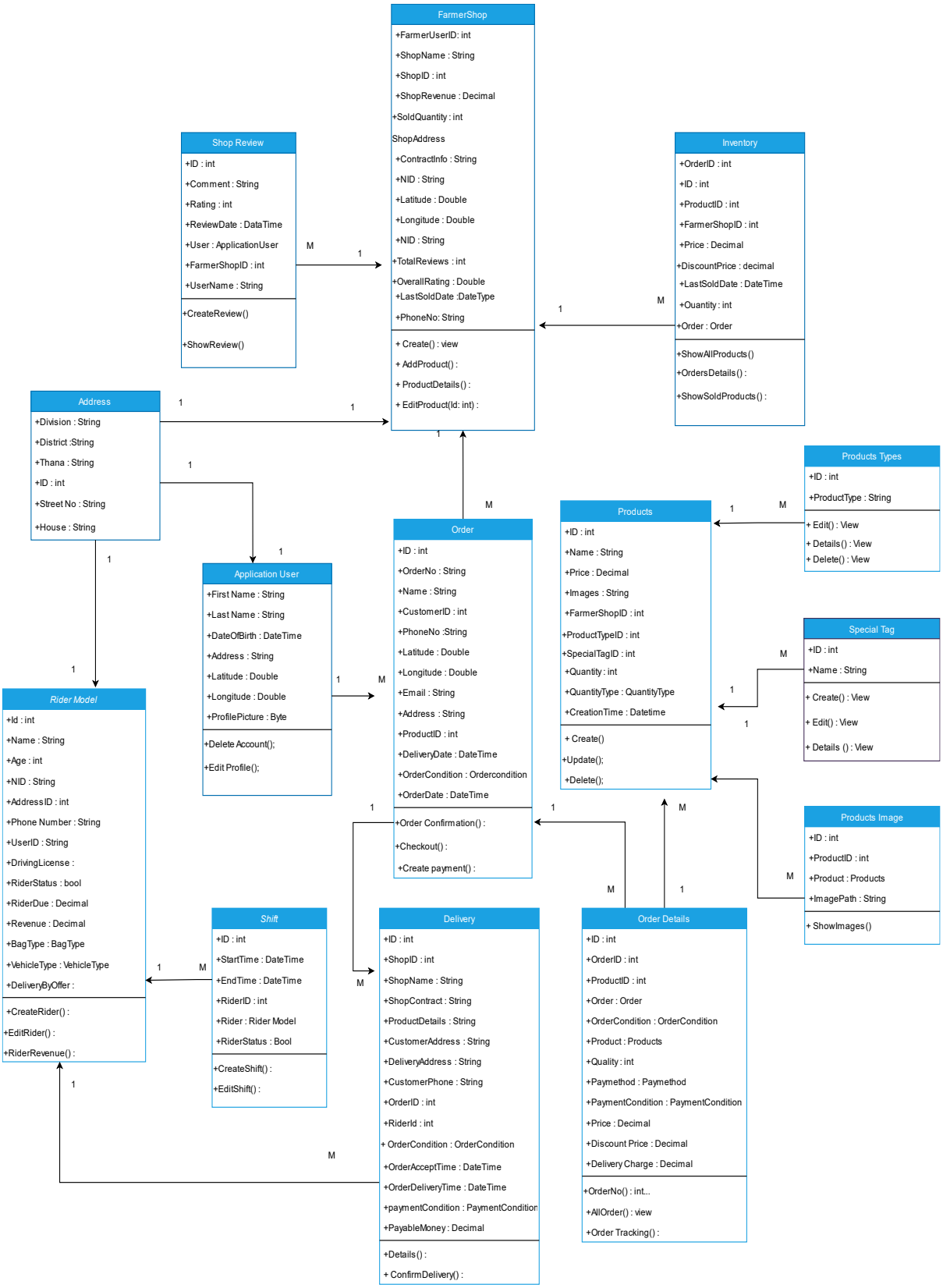


Figure 4.5.2.: Class Diagram of Organic Option

Features and Modules

The Organic Option platform is divided into various modules, each targeting a different user group and feature set.

5.3.1 Authentication:

The Identity Framework Core is used for user registration and login. It handles the creation, authentication, and management of user accounts securely. Here's how it's implemented:

Registration: When a new user signs up, they are stored in the AspNetUsers table.

The registration form collects basic user information like email, password, and role (Customer, Farmer, Rider).

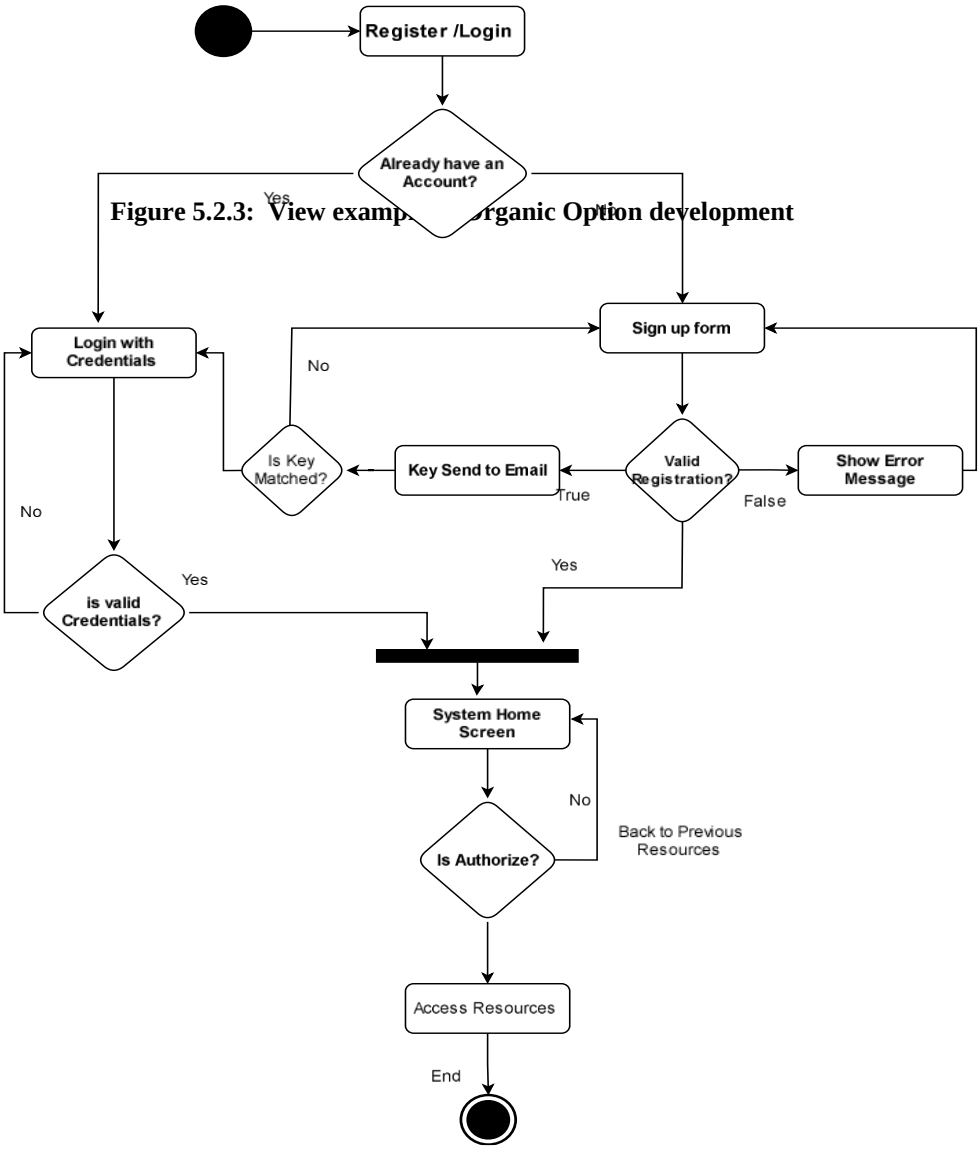


Figure 5.2.3: View examp[illegible] Organic Option development

Figure 5.3.1: User Authentication and authorization Activity Diagram

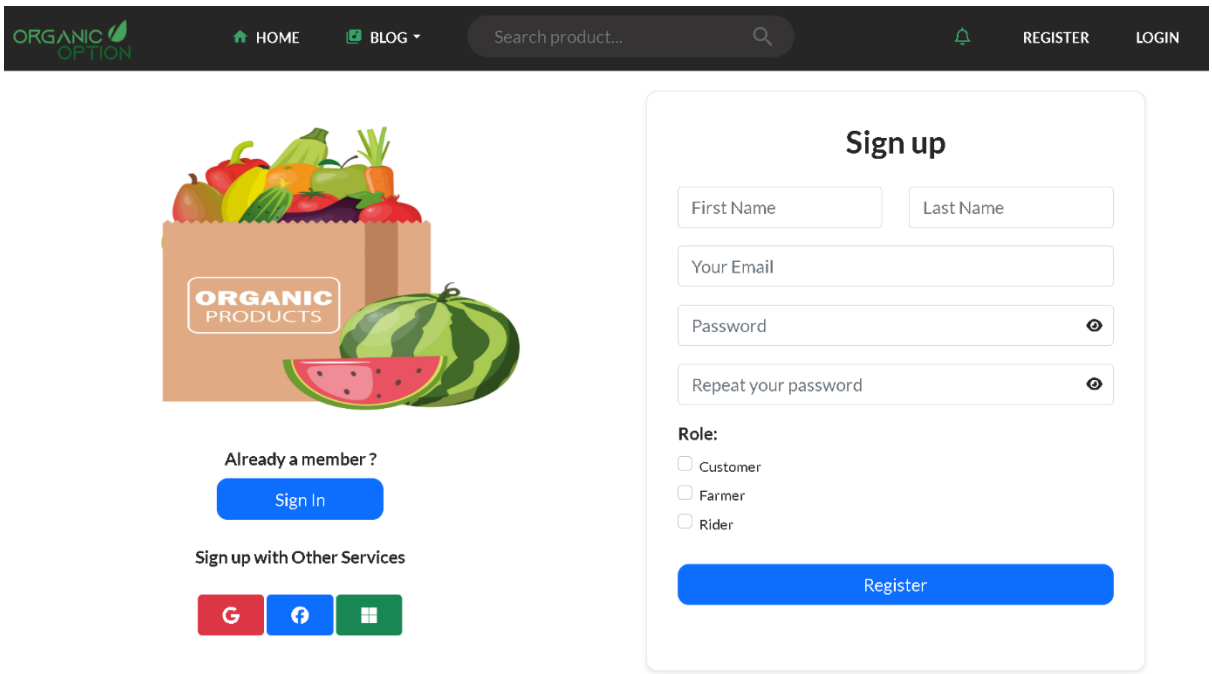


Figure 5.3.1: user registration UI

Customer can register or login in or directly browse shop. If customer wants to order a product system redirect to login page. When not login it offers register with email verification. After successful registration customer can access resources and buy products.

Login: Users log in with their registered email and password. The Identity system validates credentials and generates authentication tokens for secure sessions. Organic Option also prefer external Auth service: Google Authentication.

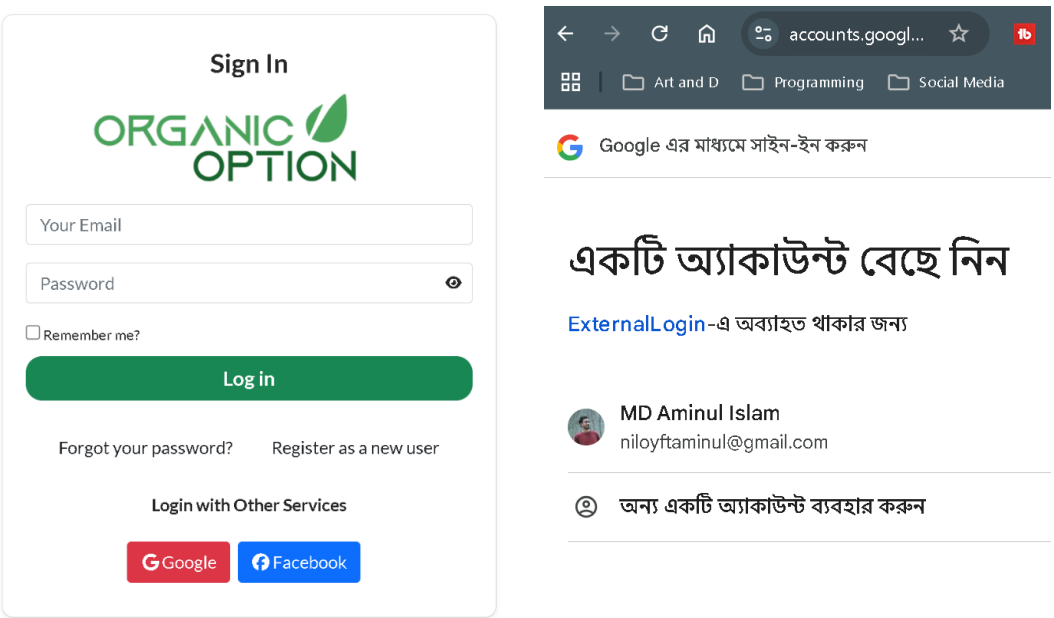


Figure 5.3.1.2: user Login with Email or External Authentication UI

5.3.2 Authorization:

After login, role-based menus and services are implemented using the Identity Framework's role management feature. Each user is assigned a role (e.g., Admin, Customer, Farmer, Rider), and menu options and services are dynamically displayed based on their role.

Role-Based Menu:

- Admin: See options for managing users, categories, feedback, and withdrawals.
- Customer: See options for browsing shops, viewing orders
- Farmer: See options for managing their shop and inventory.
- Rider: See options for delivery offers and tracking deliveries.

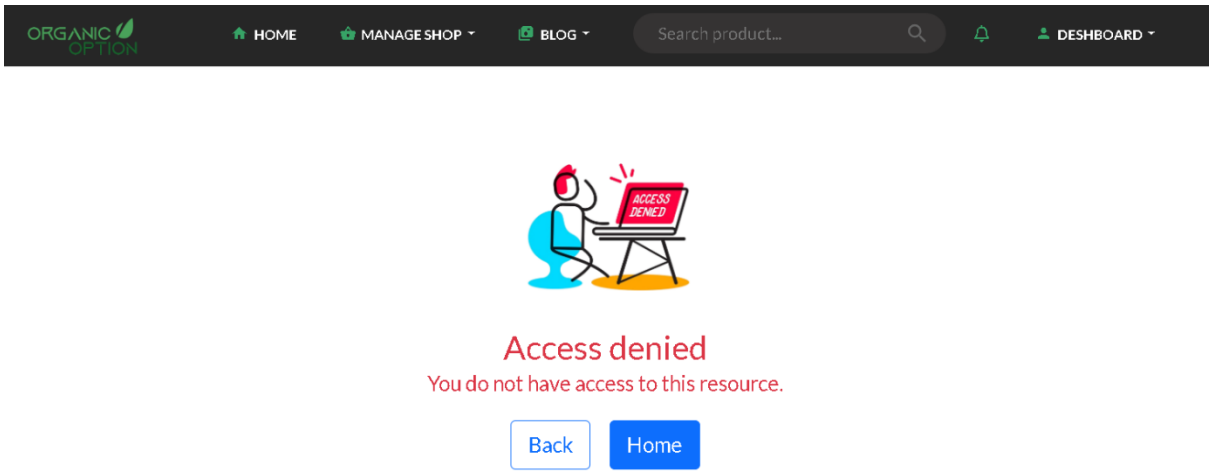


Figure 5.3.2: Prevent Unauthorize Access

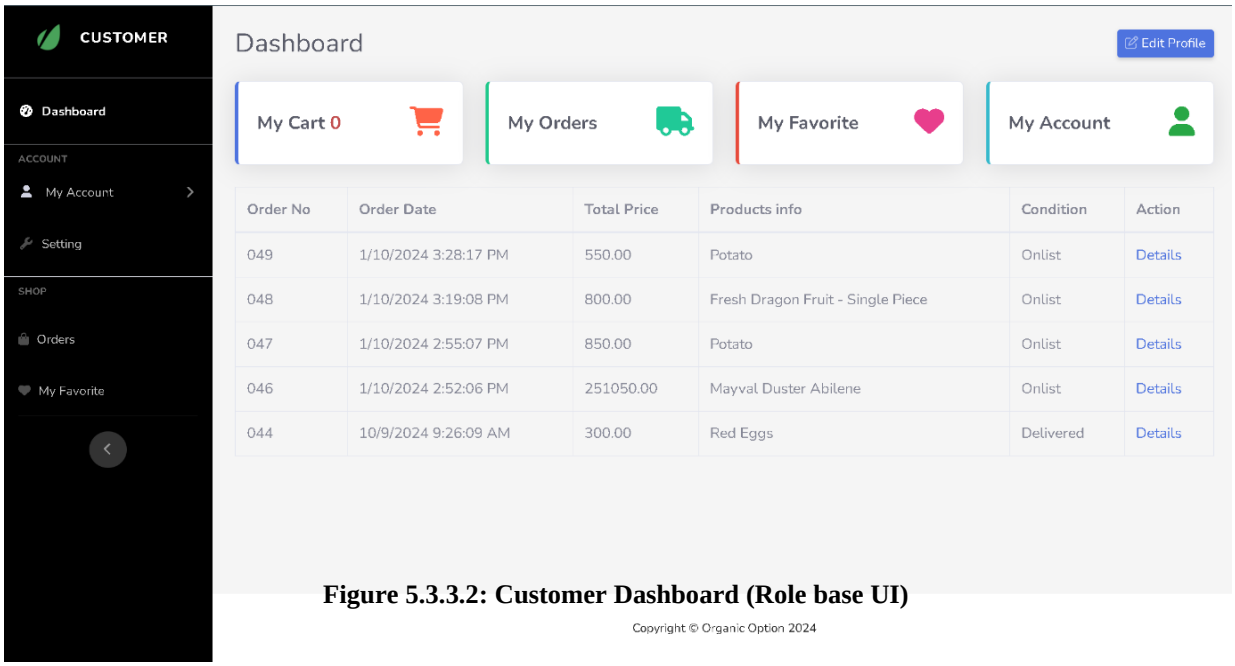


Figure 5.3.3.2: Customer Dashboard (Role base UI)

When User logged in role as Customer only customer related functionality can be managing on Customer dashboard as like order, cart, favorite, account and profile management.

As like customer and Farmer, user role Farmer role-based authorization show organic option system functionality and modularity. Performance, withdrawal management are facilitated for only farmer and rider role.

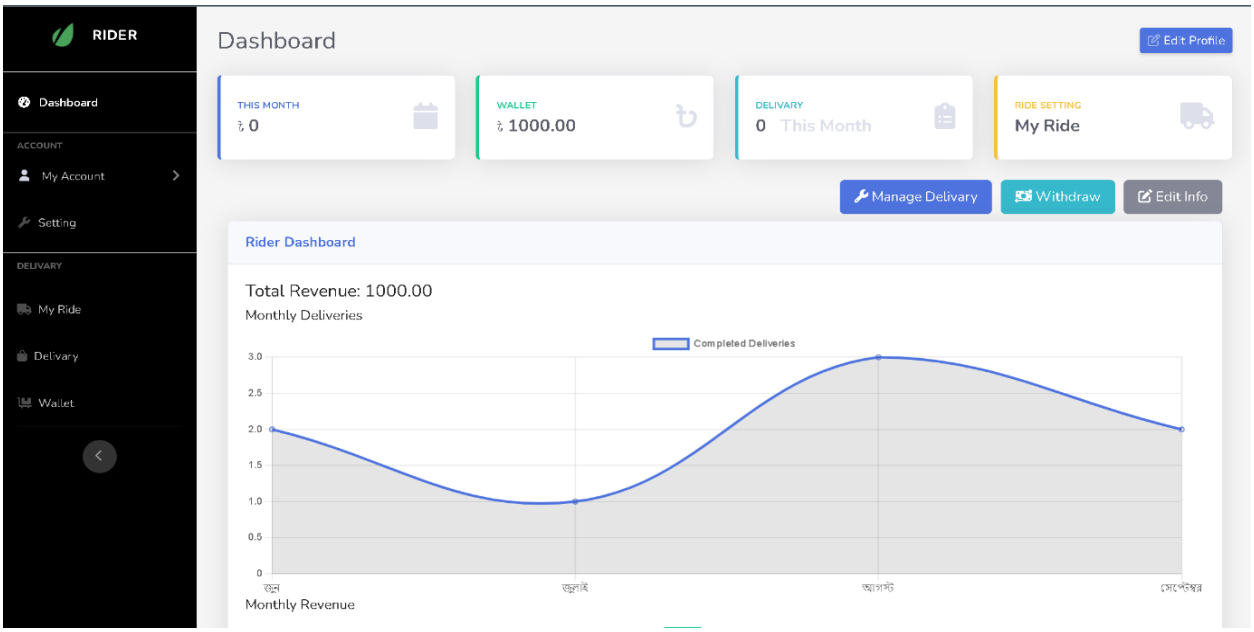


Figure 5.3.3.3: Rider Dashboard (Role base UI)

Customer Module: Browse Shops and Products: Customers can search for nearby shops based on their location and explore available products.

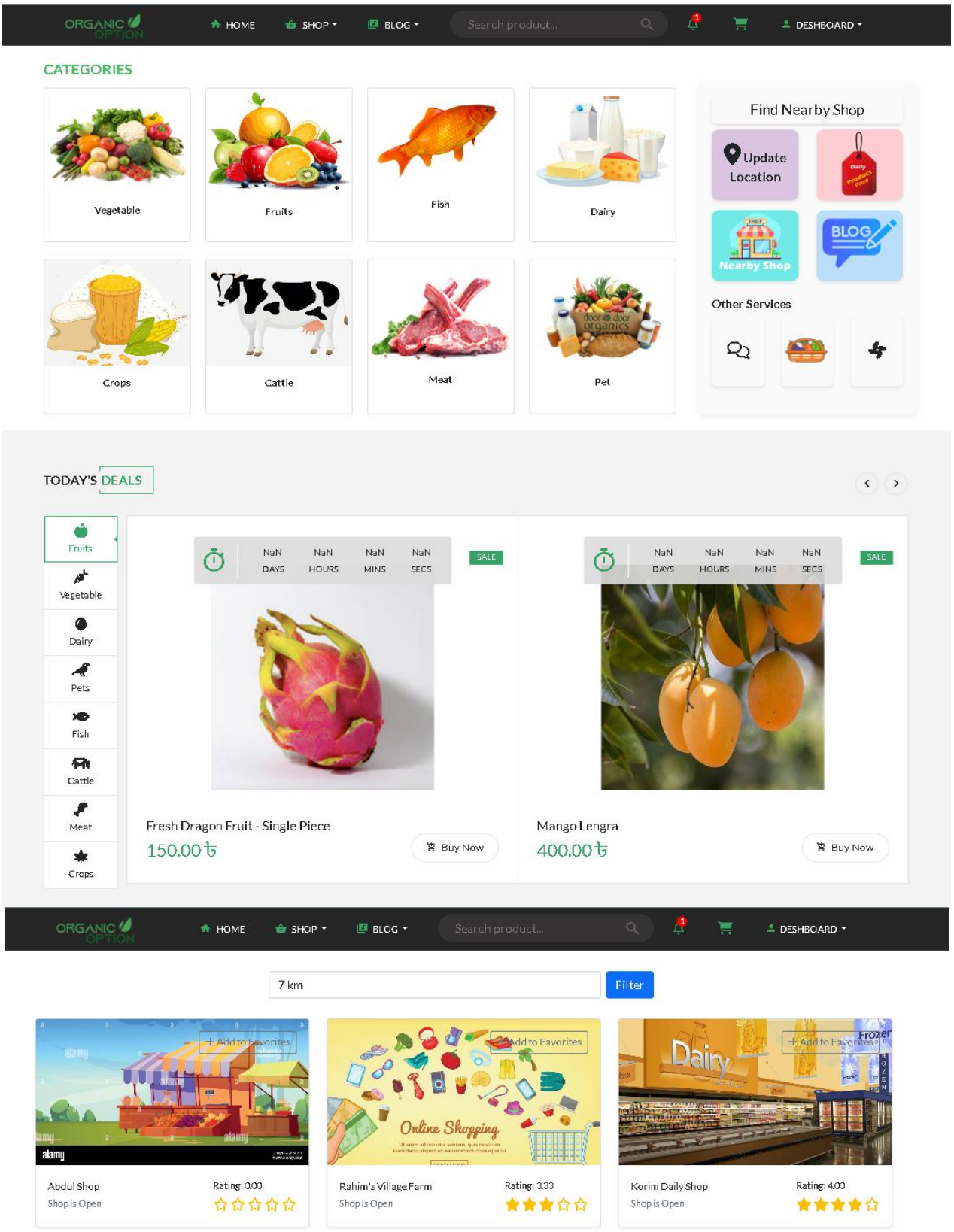


Figure 5.3.4.1 Customer Product Explore pages

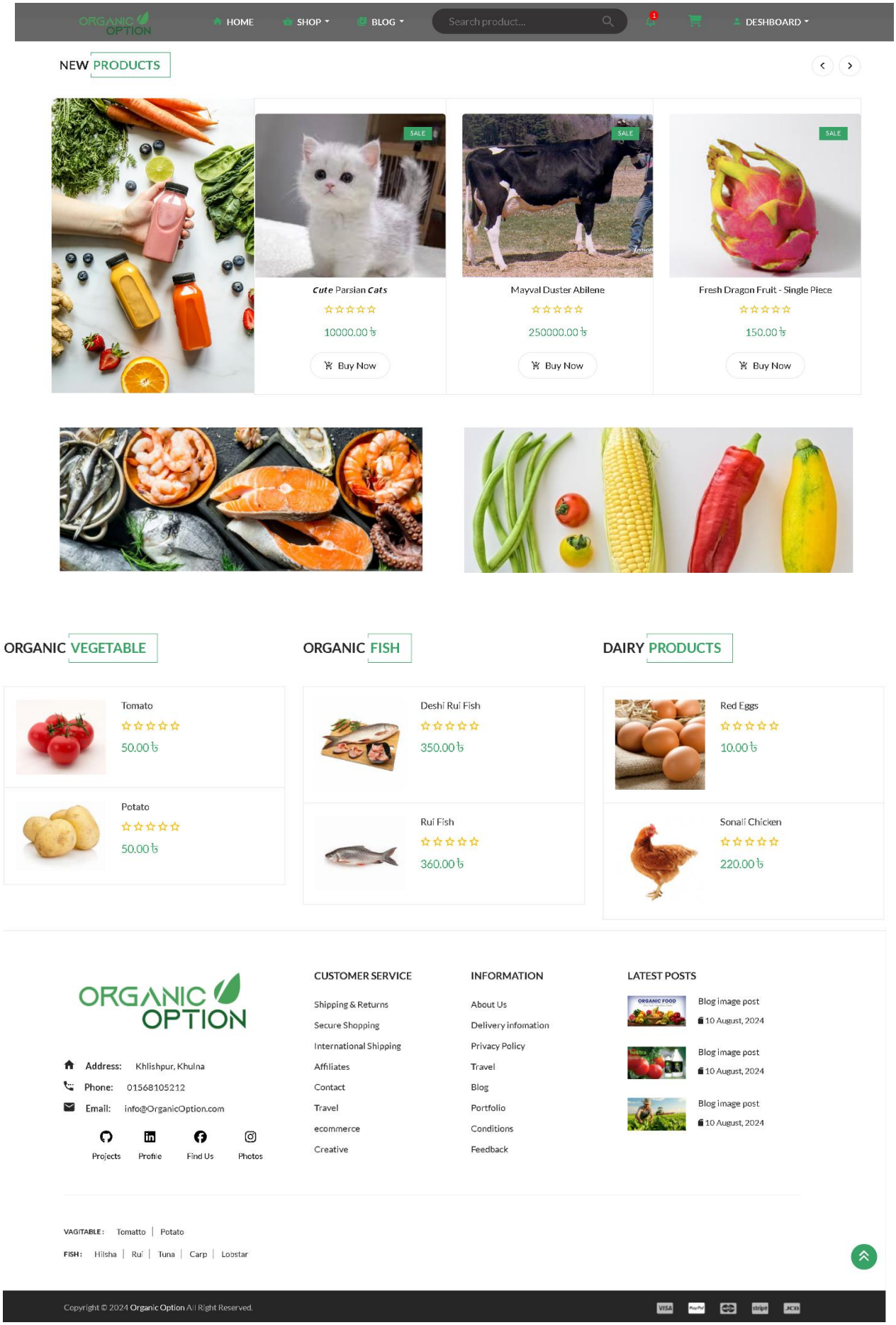


Figure 5.3.4.2 Product home pages with new products

Cart and Checkout: Customers can add products to their cart, modify their selections, and proceed to checkout.

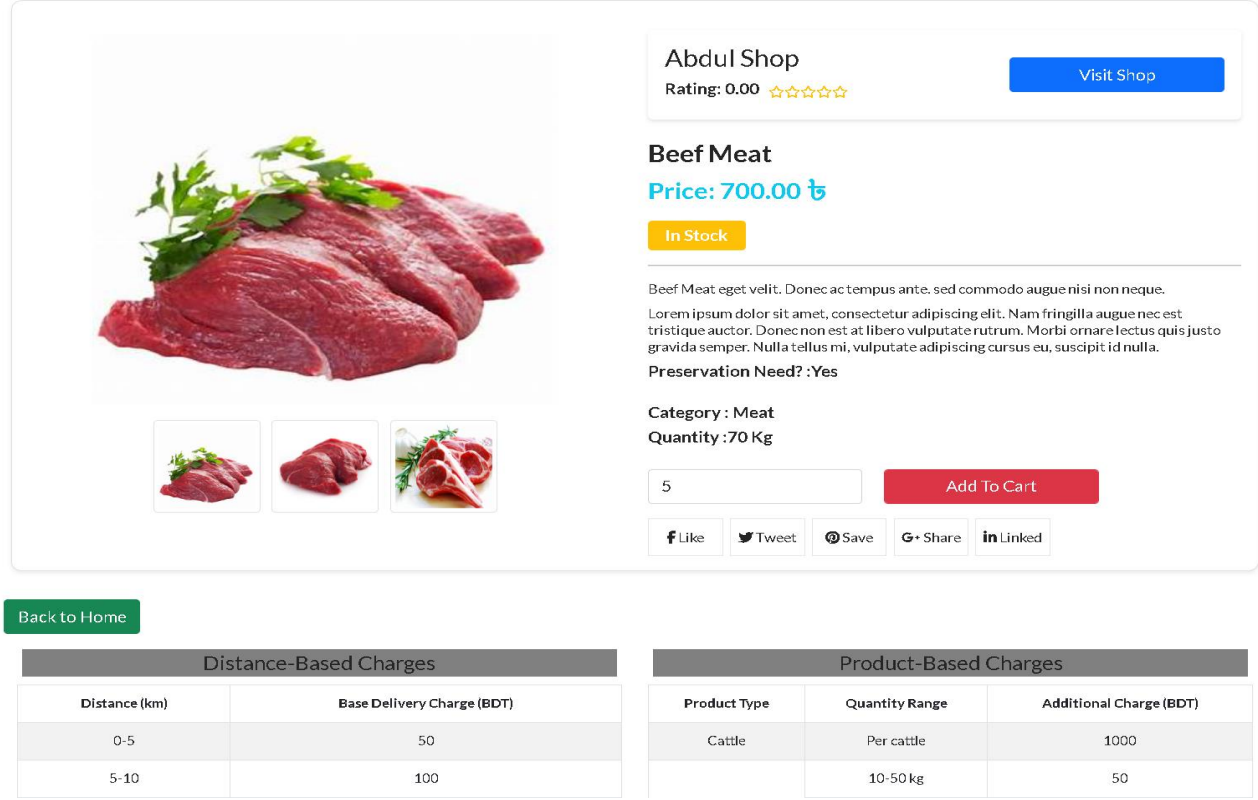


Figure 5.3.4.3 Product details Page UI

After Add to card, product add to cart item and customer can manage cart and make order by checkout.

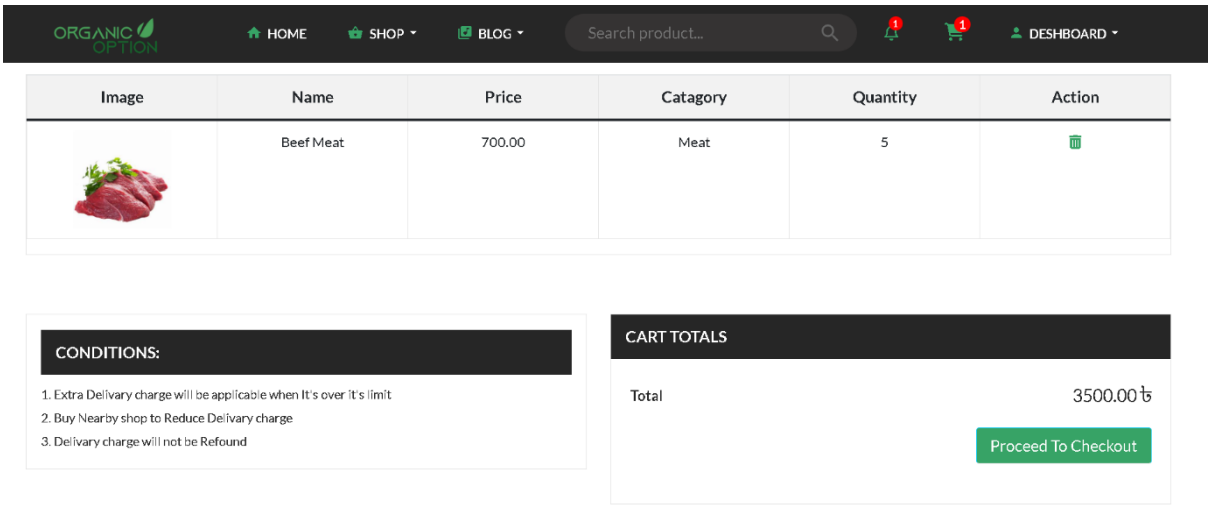


Figure 5.3.4.4 Cart management page UI

When customer checkout this process, system redirect to Order information page their customer set shipping address and show delivery charges and make order without payment.

This offer user for late payment as like **Cash on Delivery** to the Delivery rider. Customer place order with shipping information, notification send to Farmer Shop and offer sent to nearby Rider

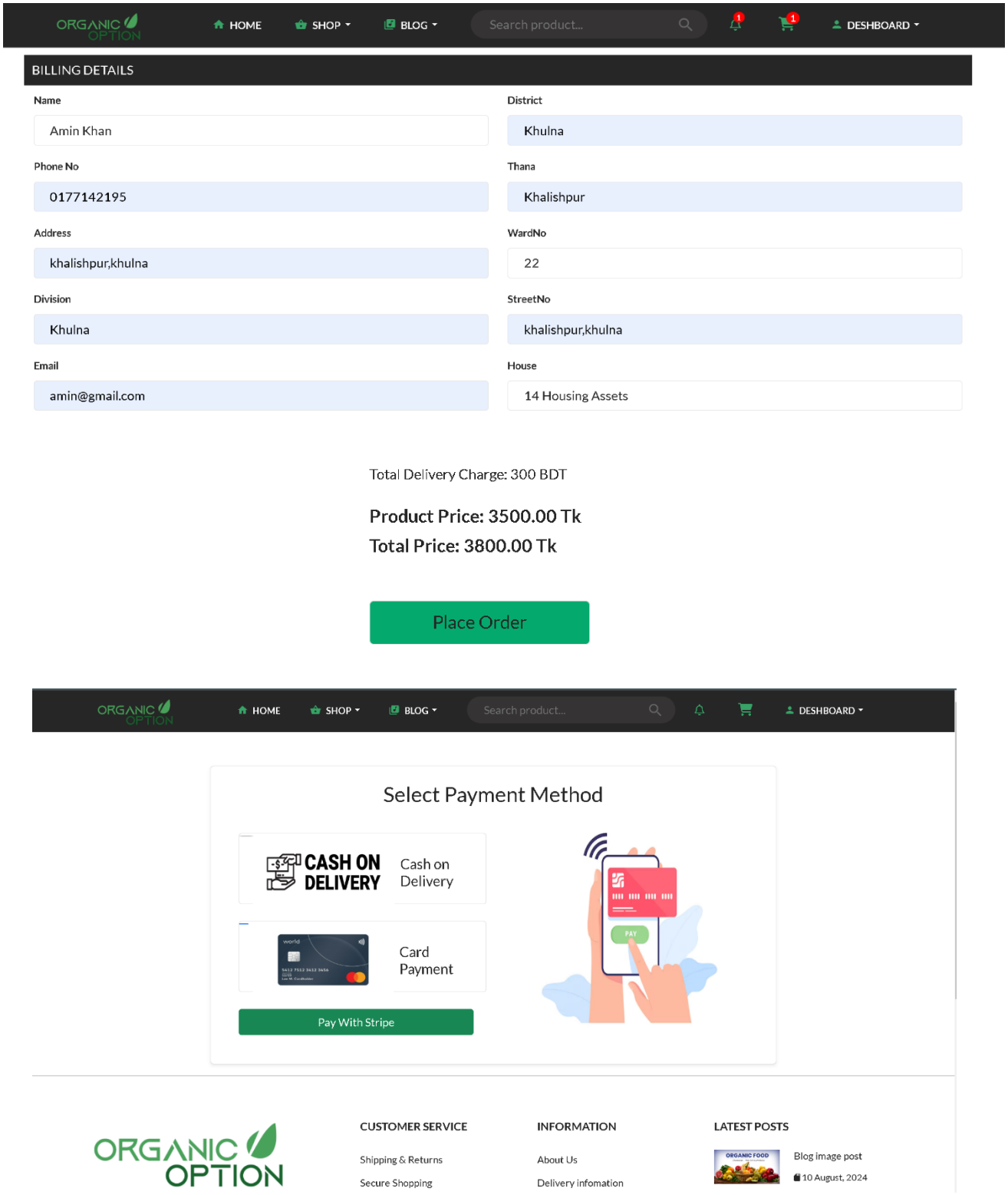


Figure 5.3.4.6 Customer Order and Payment Page

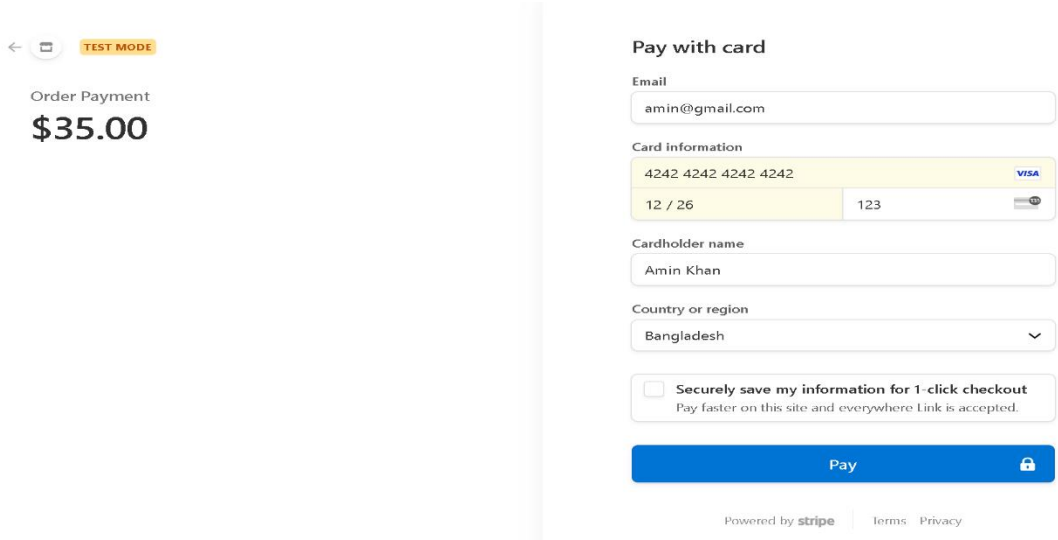
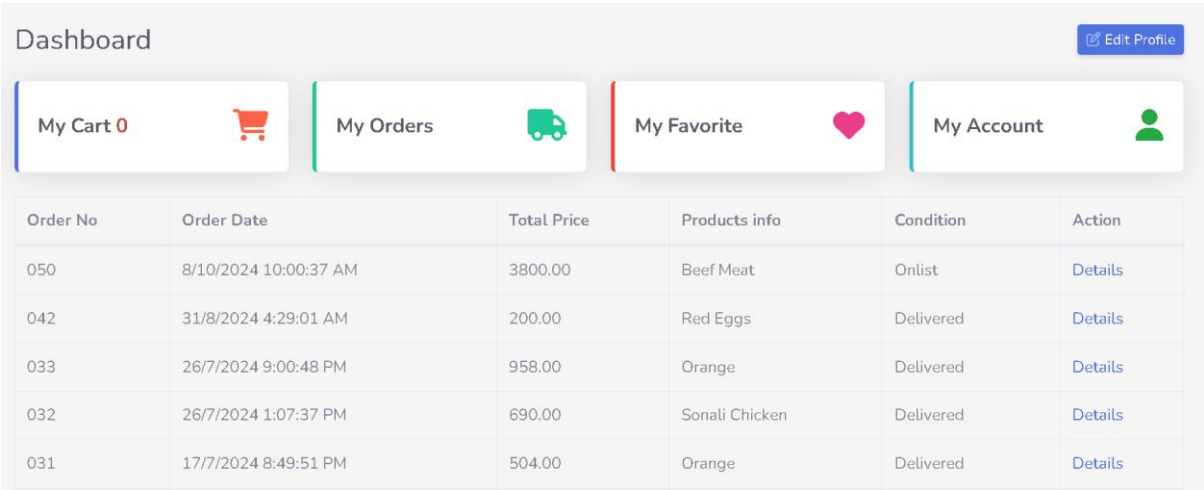


Figure 5.3.4.7 External Stripe Payment

After Place Order, system redirect to Payment page. Customer can make Cash on Delivery for Late payment or Card. External Stripe Payment implemented for Card payment that's accept internation Card for efficient and secure payment system.

After Payment Module if payment is successfully completed it redirect to Customer Order page. Customer can cancel order or Manage order history and Track order after get on delivery notification.



Order No	Order Date	Total Price	Products info	Condition	Action
050	8/10/2024 10:00:37 AM	3800.00	Beef Meat	Onlist	Details
042	31/8/2024 4:29:01 AM	200.00	Red Eggs	Delivered	Details
033	26/7/2024 9:00:48 PM	958.00	Orange	Delivered	Details
032	26/7/2024 1:07:37 PM	690.00	Sonali Chicken	Delivered	Details
031	17/7/2024 8:49:51 PM	504.00	Orange	Delivered	Details

Figure 5.3.4.8 Customer Order index page

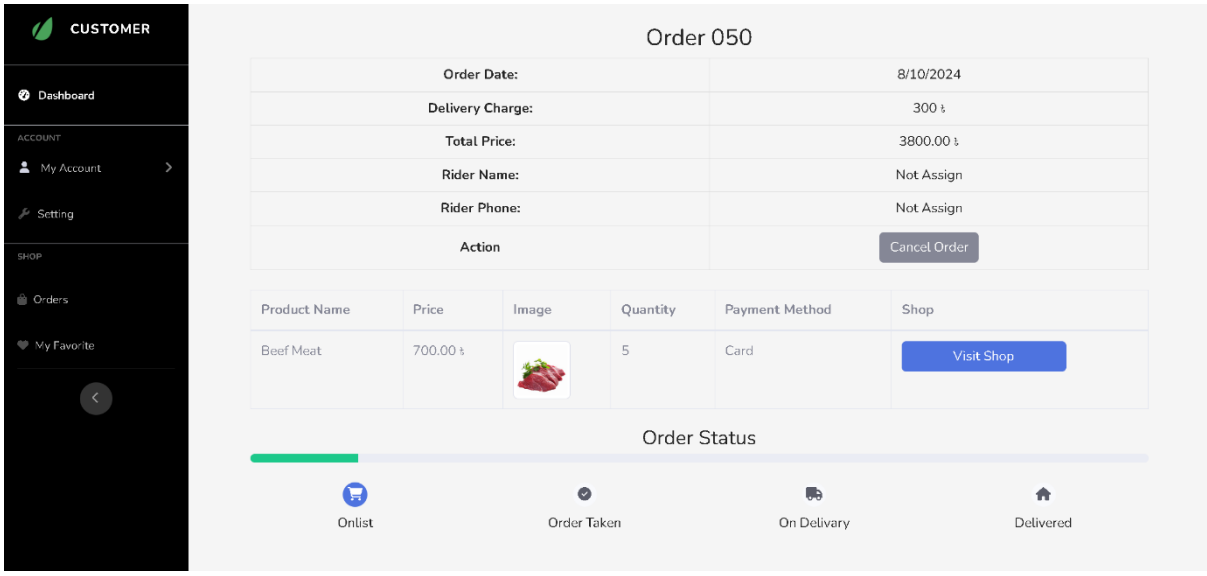


Figure 5.3.4.9 Customer Order details page

5.3.4 Farmer Module:

Shop Creation: Farmers can create, if created it redirected to Farmer shop page and manage their shop. Farmers can add, update, and delete products in their shop,

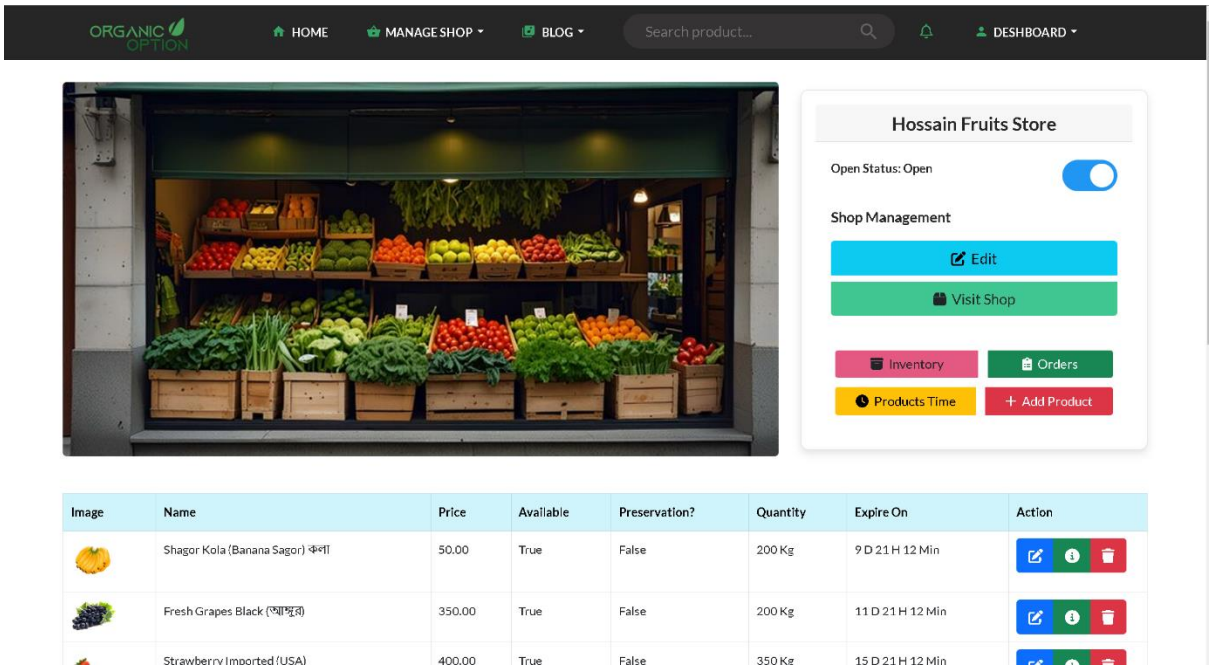


Figure 5.3.5.1 Farmer Shop Management Page

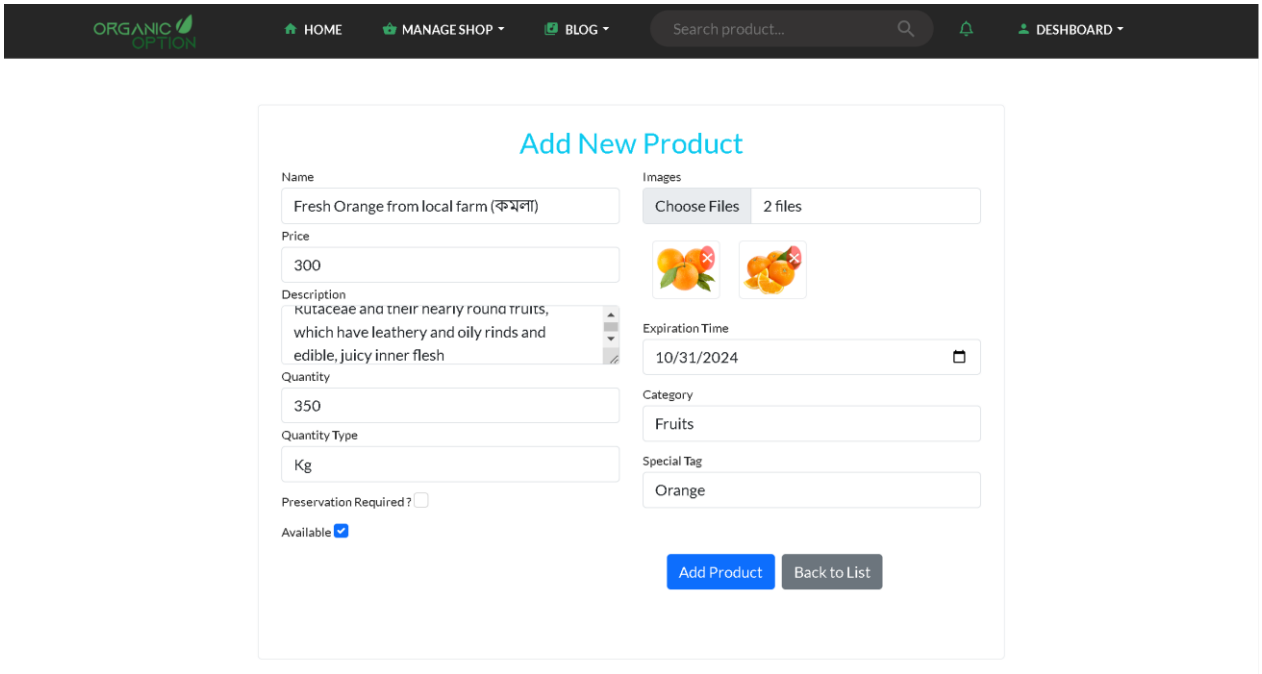
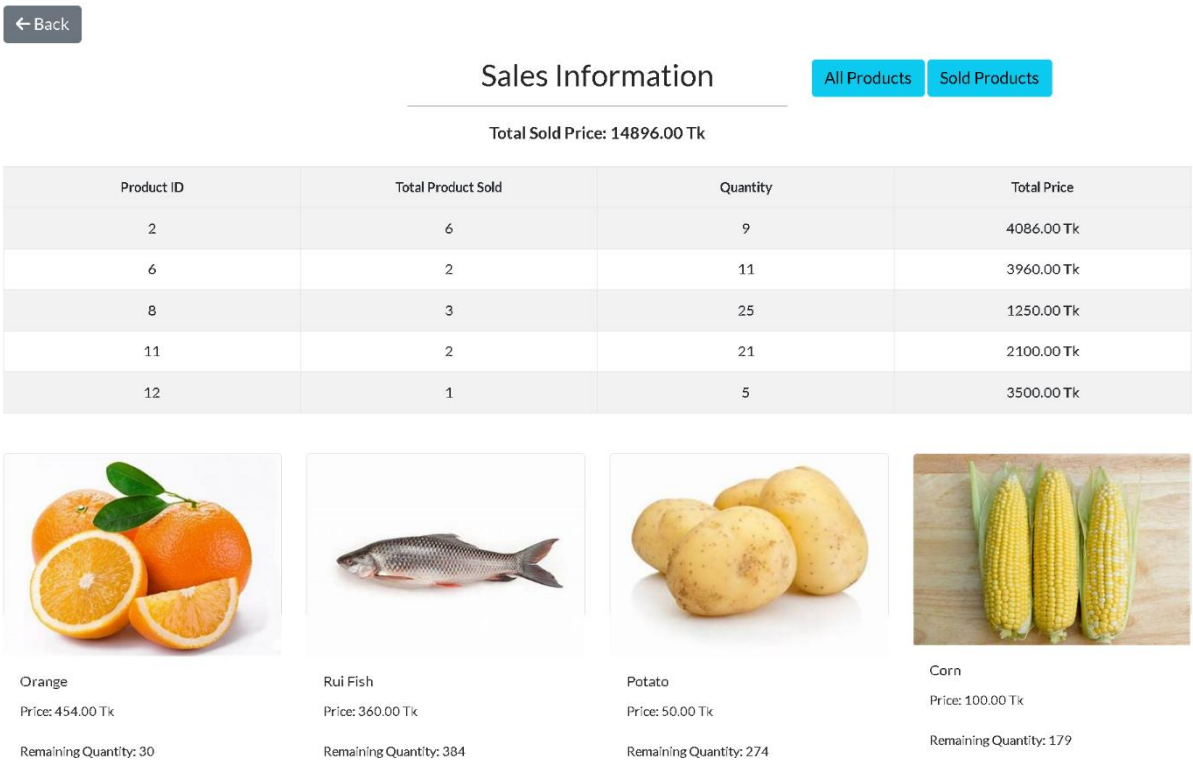


Figure 5.3.5.2 New Product add to Shop

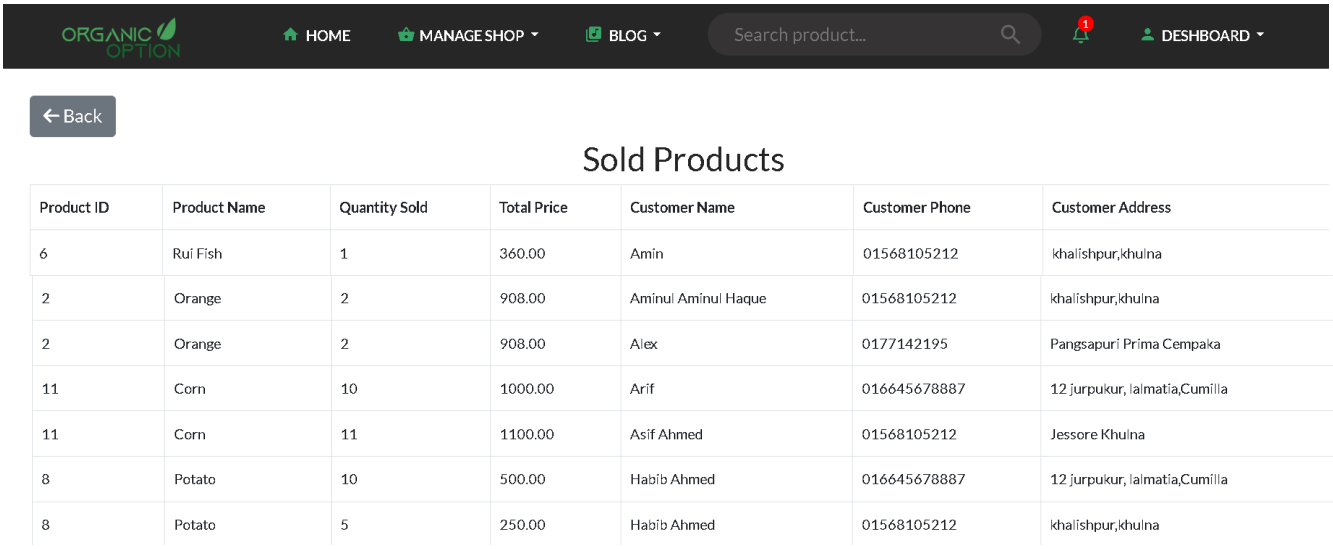
Inventory Management:

Farmer can view and Manage stock levels, and view daily/ weekly order history.



Product ID	Total Product Sold	Quantity	Total Price
2	6	9	4086.00 Tk
6	2	11	3960.00 Tk
8	3	25	1250.00 Tk
11	2	21	2100.00 Tk
12	1	5	3500.00 Tk

Figure 5.3.5.3 Inventory Management of Farmer Shop



Product ID	Product Name	Quantity Sold	Total Price	Customer Name	Customer Phone	Customer Address
6	Rui Fish	1	360.00	Amin	01568105212	khalishpur,khulna
2	Orange	2	908.00	Aminul Aminul Haque	01568105212	khalishpur,khulna
2	Orange	2	908.00	Alex	0177142195	Pangsapuri Prima Cempaka
11	Corn	10	1000.00	Arif	016645678887	12 jurpukur, lalmatia,Cumilla
11	Corn	11	1100.00	Asif Ahmed	01568105212	Jessore Khulna
8	Potato	10	500.00	Habib Ahmed	016645678887	12 jurpukur, lalmatia,Cumilla
8	Potato	5	250.00	Habib Ahmed	01568105212	khalishpur,khulna

Figure 5.3.5.4 Inventory Management Sold Products

Inventory management is an important features of Farmer shop. Realtime Product sold, stock analysis, total sold, remaining item quantity and time-based product sell information. Unsold product can be view on this section that's help farmer to manage farmer shop and increase product order capability and revenue. Product sold history helps farmer to amylase product demands and product selling progress. It's an reflect of customer choice order engagement, shop performance and revenue.

Time based product management is an important features or Farmer shop Inventory. We platform offer organic daily used products like fish, vegetable, crops, meat, fruits etc. Those products are perishable, so need proper management otherwise product will be wasted.

Organic option offers product time during product creation so that farmer can track product remaining time to sell local market or wait for a time limit. These features help farmer to proper inventory tracking and product management.

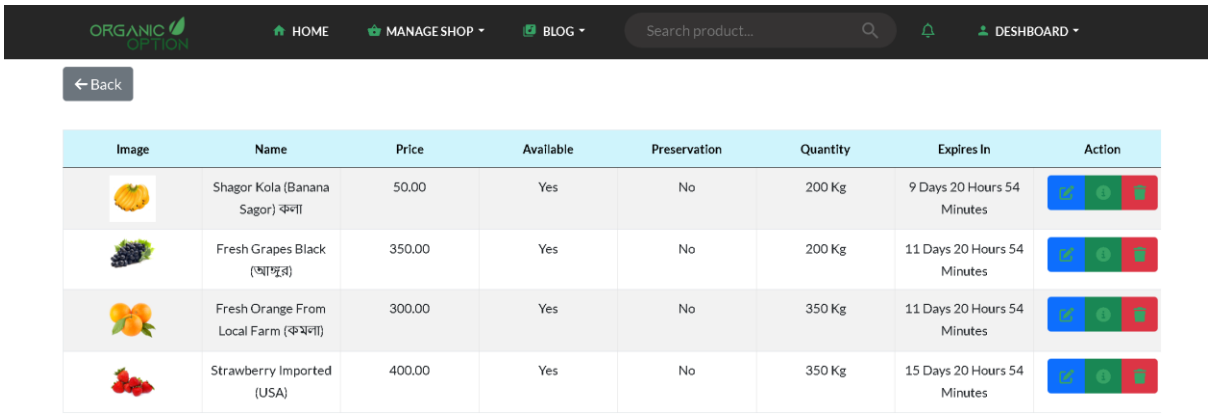


Image	Name	Price	Available	Preservation	Quantity	Expires In	Action
	Shagor Kola (Banana Sagor) কলা	50.00	Yes	No	200 Kg	9 Days 20 Hours 54 Minutes	
	Fresh Grapes Black (আঙ্গুর)	350.00	Yes	No	200 Kg	11 Days 20 Hours 54 Minutes	
	Fresh Orange From Local Farm (কমলা)	300.00	Yes	No	350 Kg	11 Days 20 Hours 54 Minutes	
	Strawberry Imported (USA)	400.00	Yes	No	350 Kg	15 Days 20 Hours 54 Minutes	

Figure 5.3.5.5 Product Time based Inventory Management

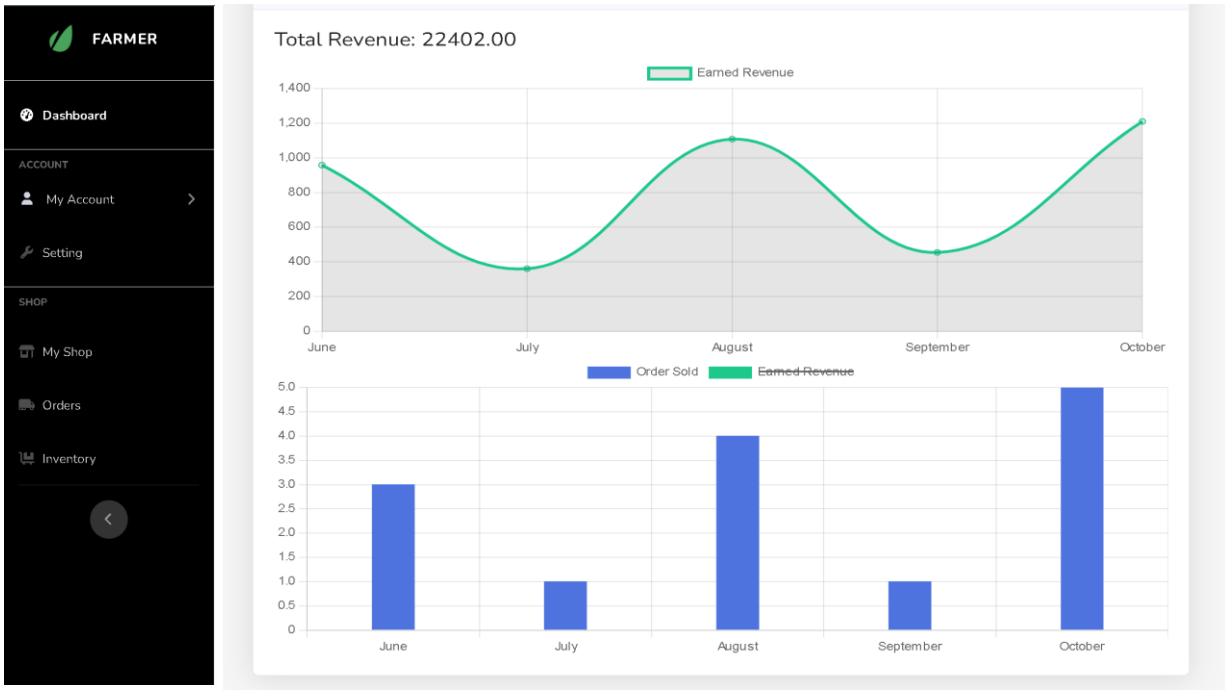


Figure 5.3.5.6 Farmer Shop sales and order statistics

Overall, this time-based product management help to reduce unintentionally product garbage and improve product selling and increase revenue.

Shop Revenue:

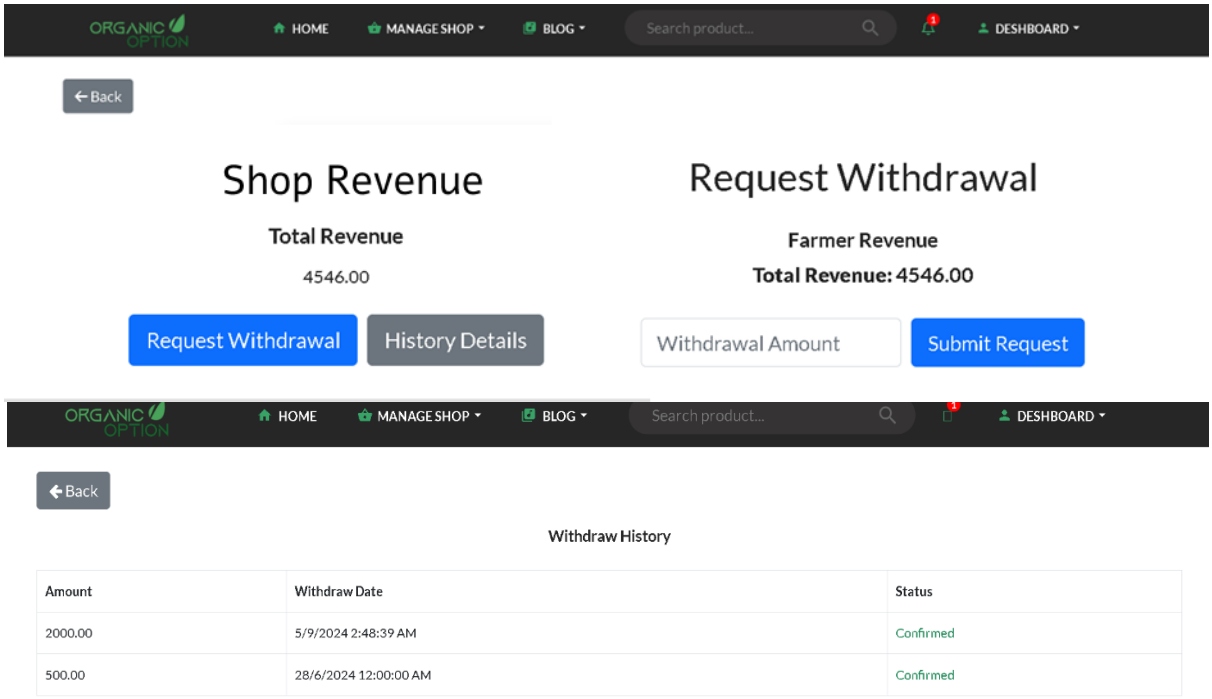


Figure 5.3.5.6 Shop revenue and withdraw history

When delivery rider comes shop for precuts pickup, Farmer release relevant order from order management. After release order, product price added to shop revenue. Platform Admin will set a policy for withdraw and platform cost. Both farmer and Rider make withdraw with withdraw request. After admin account section request approve, farmer and rider will get cash money.

Rider Delivery Module:

Delivery Rider is responsible for order delivery from farmer shop to customer location. This platform offer rider to create and make delivery that's will help local unemployed persons.

They will create Ride with personal information like national id, address and phone number. Based on platform policy and condition rider start delivery journey that's will help them to earn money and customer delivery service.

Rider will responsible to collect cash on delivery money that's create a rider due and after limit cross, rider have to transfer money to platform account section. With trust and responsibility, rider delivery part is an important part for Organic Option

Delivery Management: Riders can view available delivery offers, accept offers based on proximity, and track their delivery tasks. Also, rider can see running delivery, delivery history, performance and revenue.

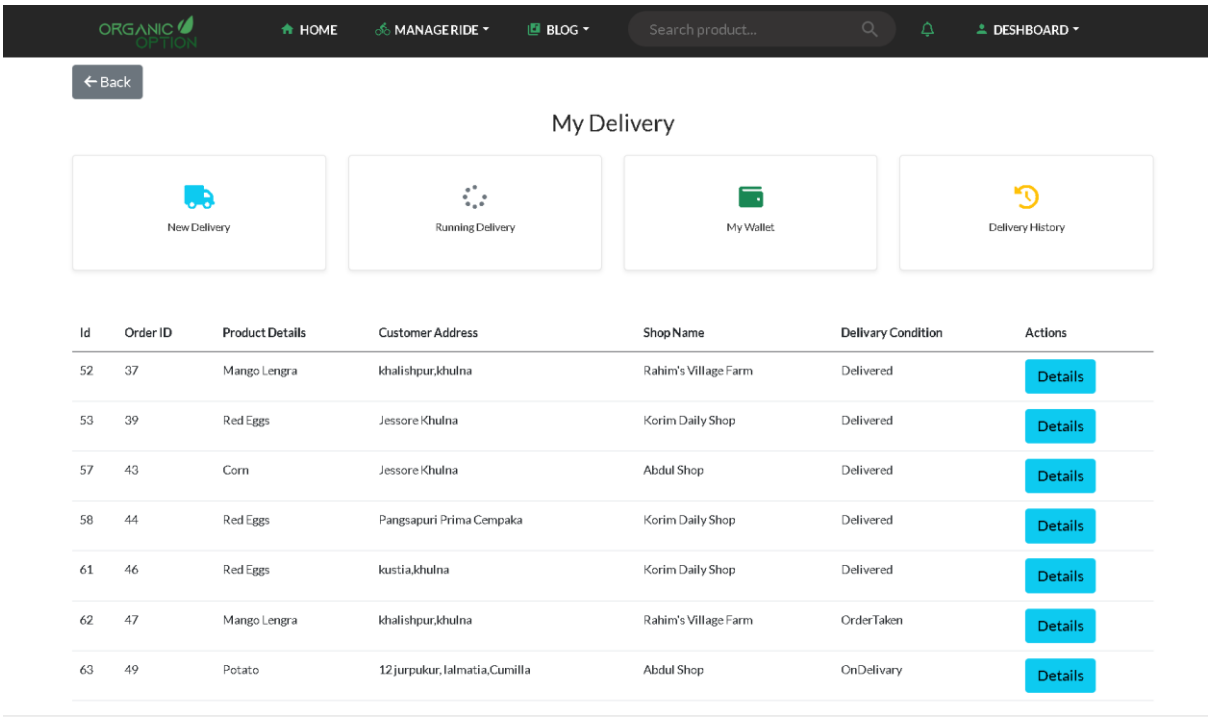


Figure 5.3.6.1 Rider Order management

Rider Offer:

Rider started delivery with rider session. Rider can start session with vehicle choice and relevant bag type. Platform offer rider to deliver with bicycle, bike, van, track and boat and bag like medium bag to large container.

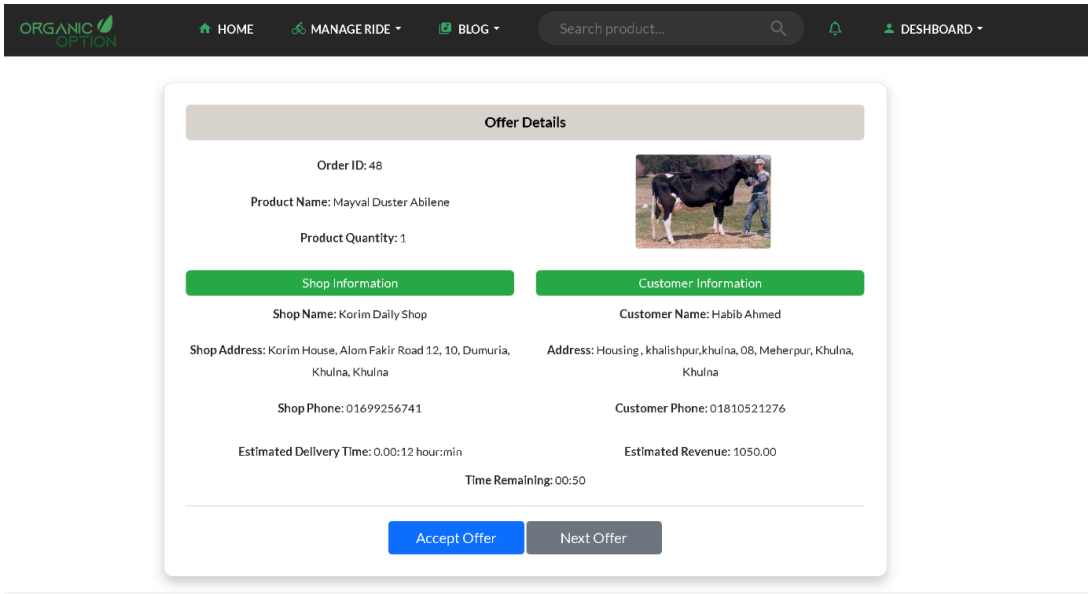


Figure 5.3.6.2 Rider Order offer

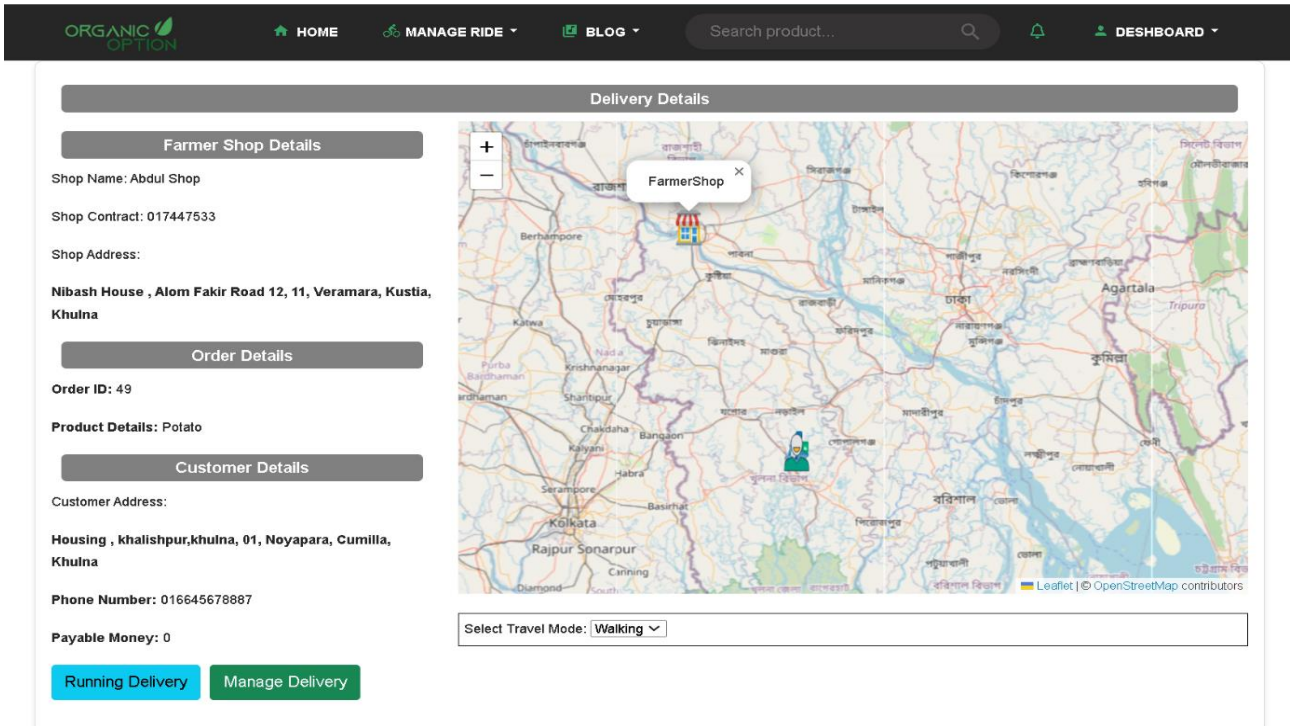


Figure 5.3.6.2 Rider On way to pick up from Farmer shop

Order condition Order Taken that are in order table is offered to shop and customer nearby rider. Every offer is display for 1 minute with customer and shop details. Delivery time and

estimated income display or offer. After 1 minute automatically offer goes to next rider and rider get new offer. After accept offer, it set on rider delivery, order condition in order taken and notification sent to order relevant farmer shop and Customer.

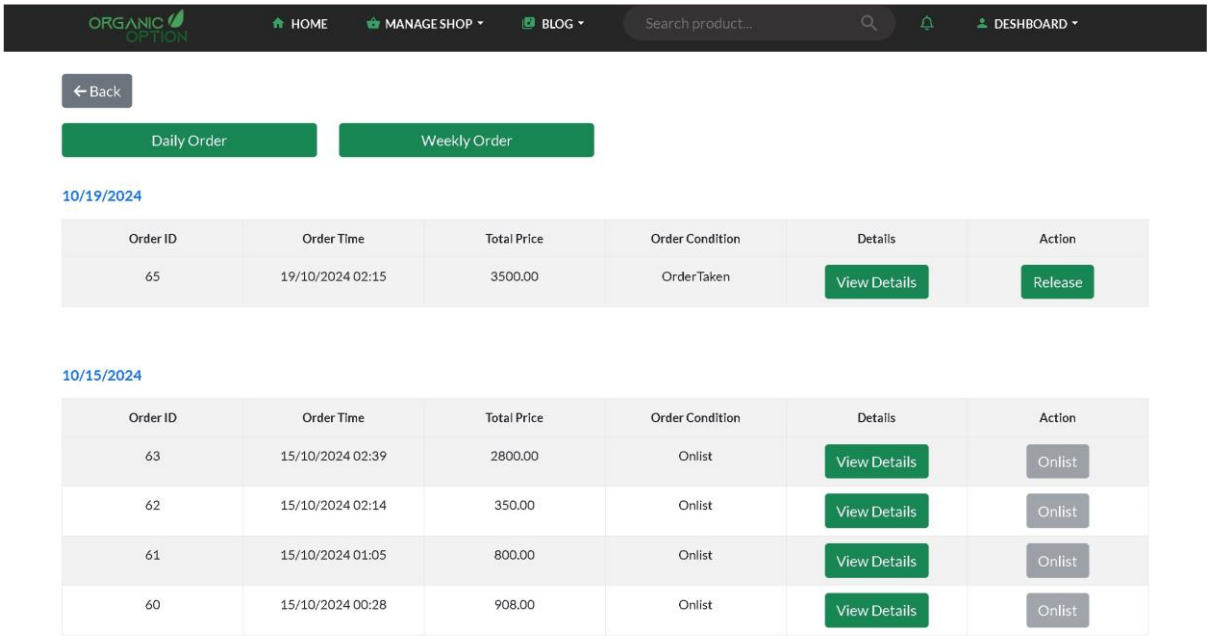
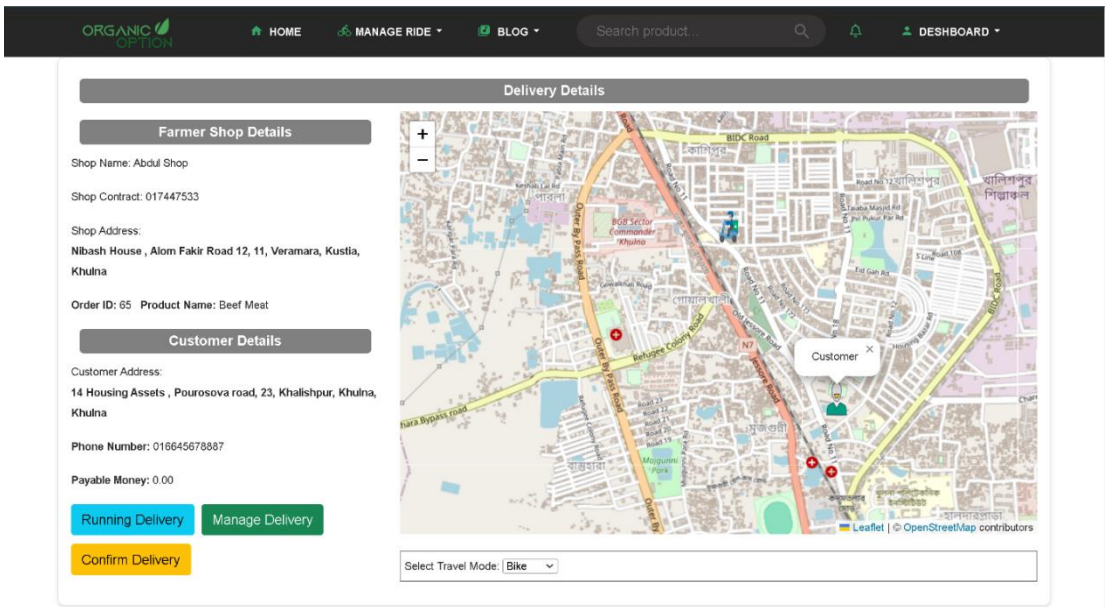


Figure 5.3.6.3 Farmer shop order release



Farmer will prepare relevant order. Overleaf map show farmer location and customer location on map. When rider arrive farmer shop and match order id, farmer release order. Order related product amount is set on farmer shop revenue and order state are on delivery. Customer gets

Figure 5.3.6.4 Rider go for order delivery

notification to order track that order on delivery. During delivery time rider can pickup delivery that are is same route.

After Farmer order release system send notification to corresponding customer that order is on delivery. Customer can track order. Rider confirms delivery and collect cash from customer if order is cash on delivery. After successful order delivery customer can review corresponding farmer shop.

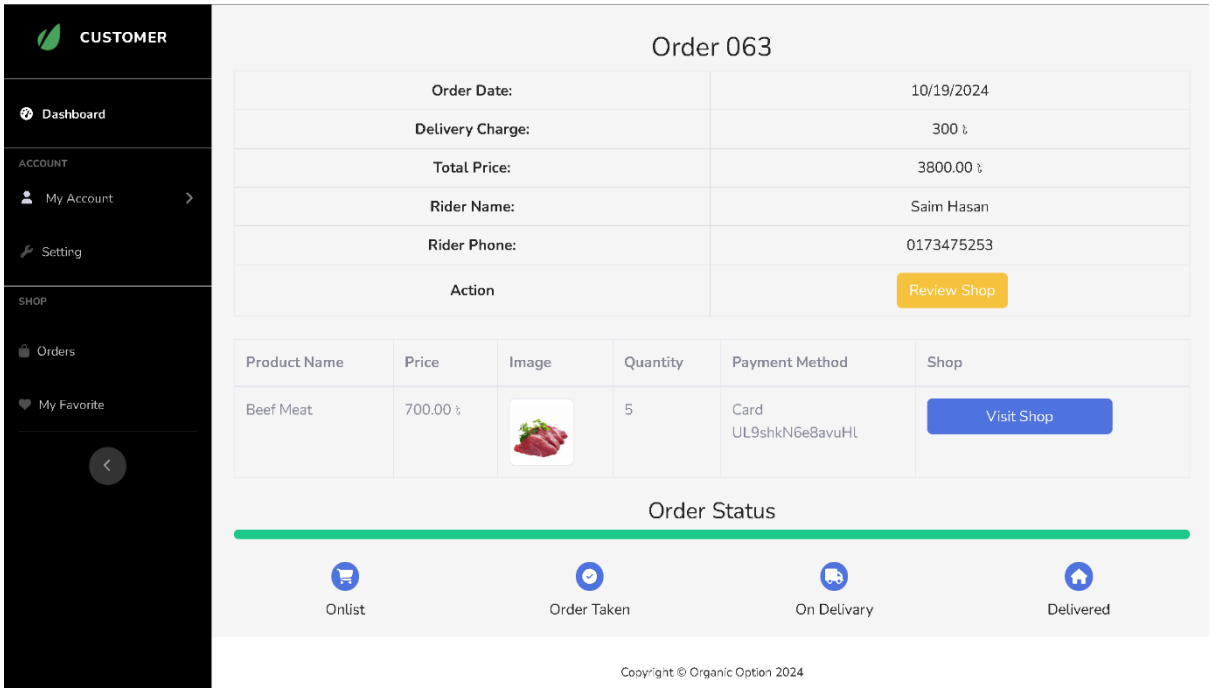


Figure 5.3.6.5 Customer order tracking

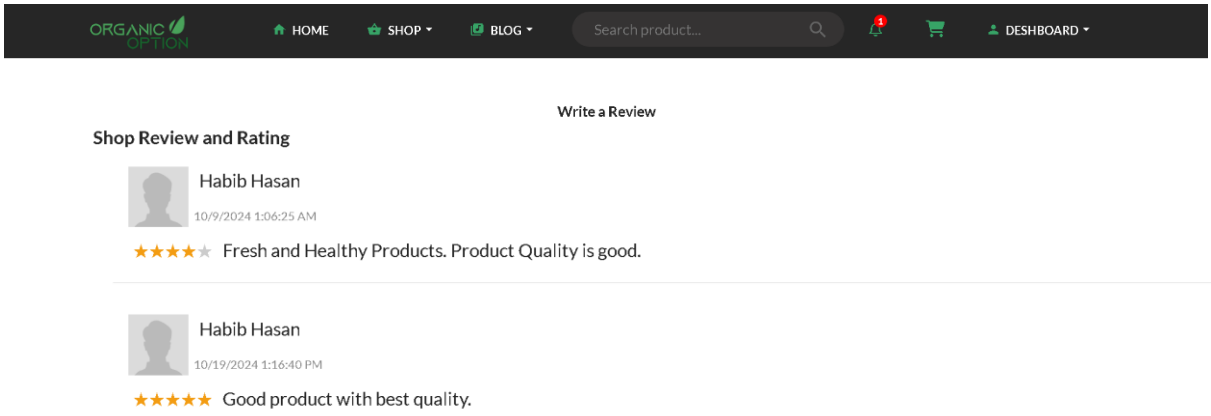


Figure 5.3.6.6 Customer Shop review and rating

Admin Module: The admin can manage all users (customers, farmers, and riders), including adding or disabling users.

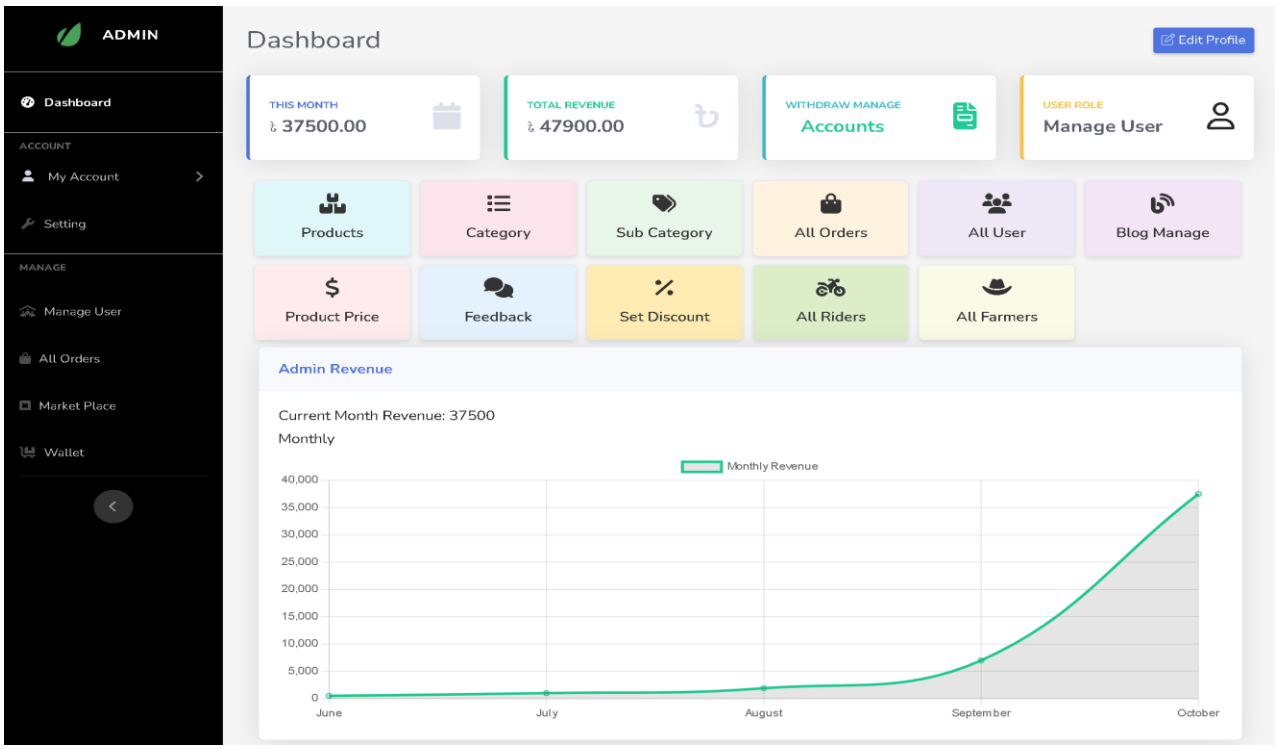


Figure 5.3.7.1 Admin Dashboard UI

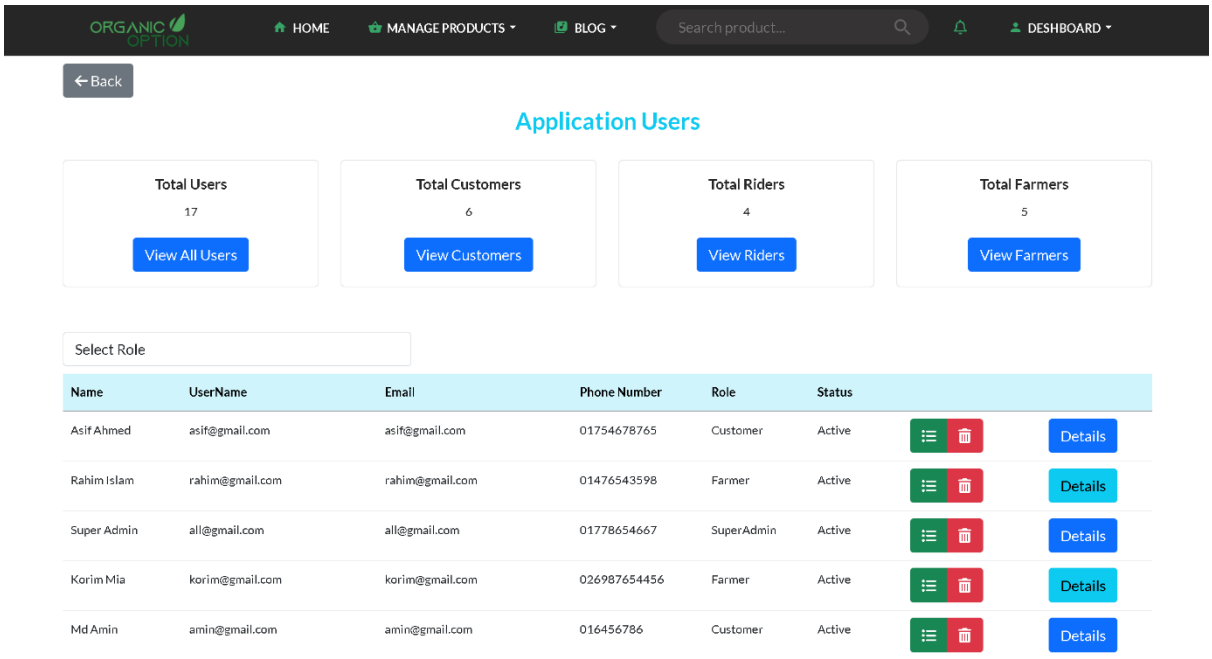


Figure 5.3.7.2 Admin Application user management

Order Management: Admins monitor all orders and manage history and complains

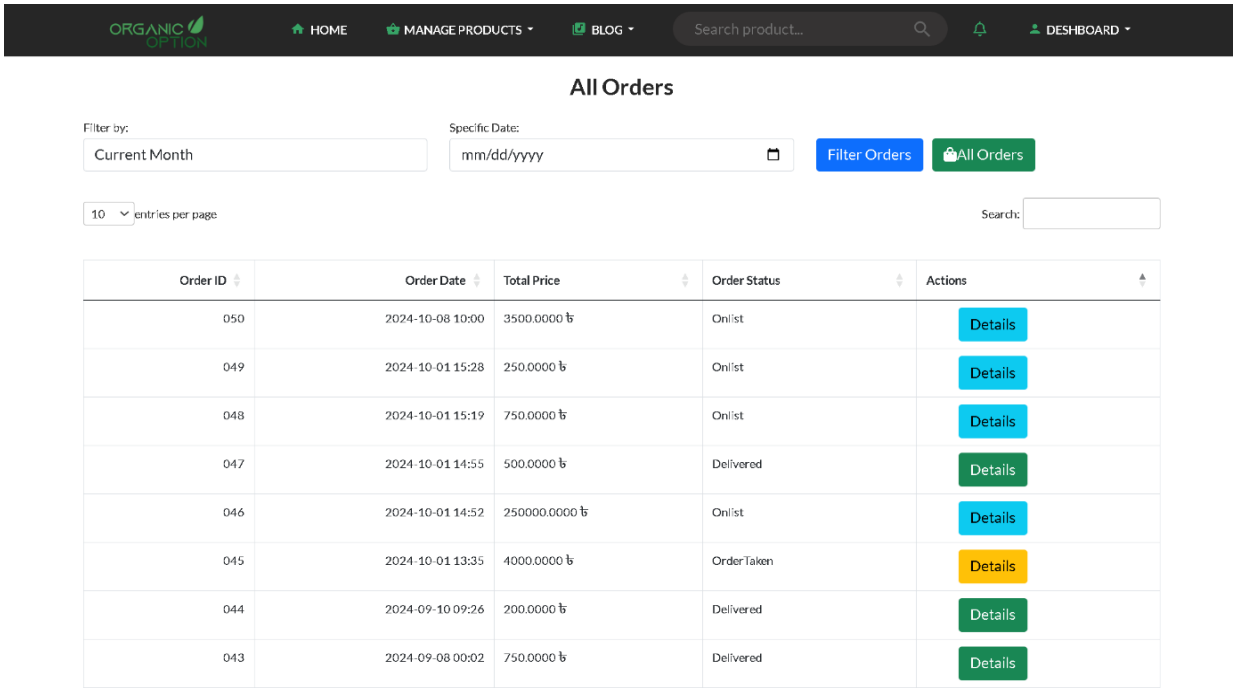


Figure 5.3.7.3 Admin order Monitoring

Payment Module:

Stripe Integration: The system integrates with the Stripe API to handle secure payments for online transactions. Cash on Delivery (COD): For customers opting for COD, the system marks the order for cash payment upon delivery, and riders handle the collection.

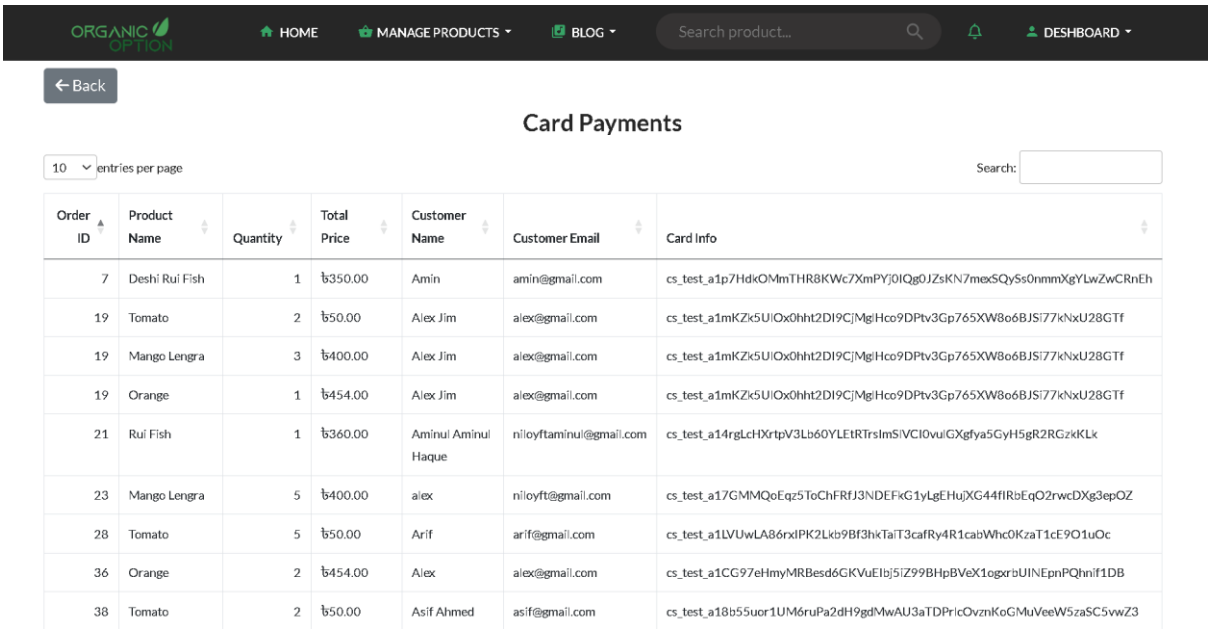


Figure 5.3.7.4 Card Order Monitoring

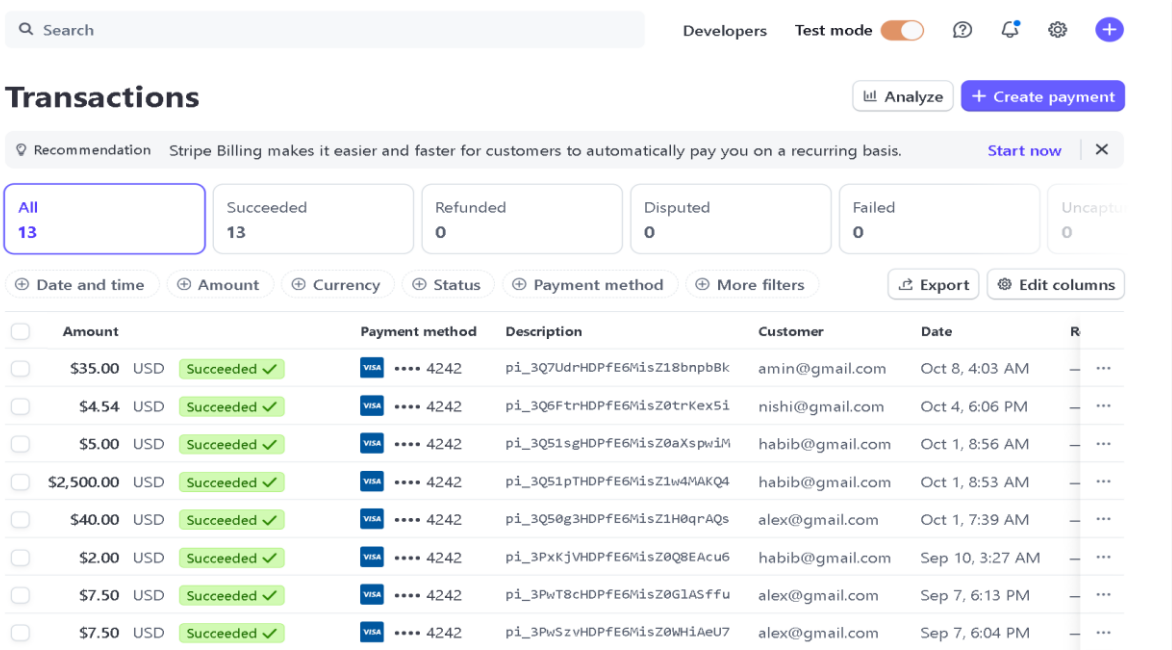


Figure 5.3.7.5 Stripe payment history

External Stripe payment transactions track card payment history and manage card payment module. This offer refund and failed transaction management after product order.

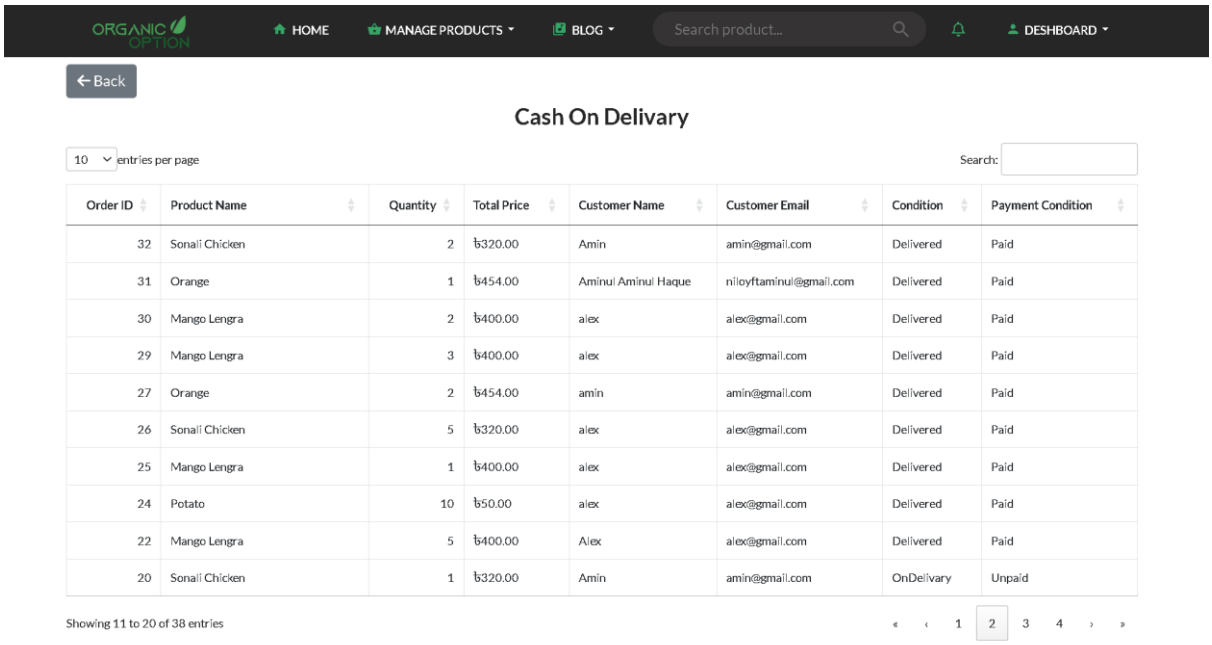


Figure 5.3.7.6 Cash on Delivery Order Monitoring

Cash on delivery History map and track rider due and overall customer engagement of cash delivery. This refers hassle free easy shopping experience among users. Account manages cash order and collated by rider.

5.3.8 User-Focused Features:

In prioritizing an enriched user experience, the project introduces several user-focused features as like trusted or favorite shop bookmark and manage later.

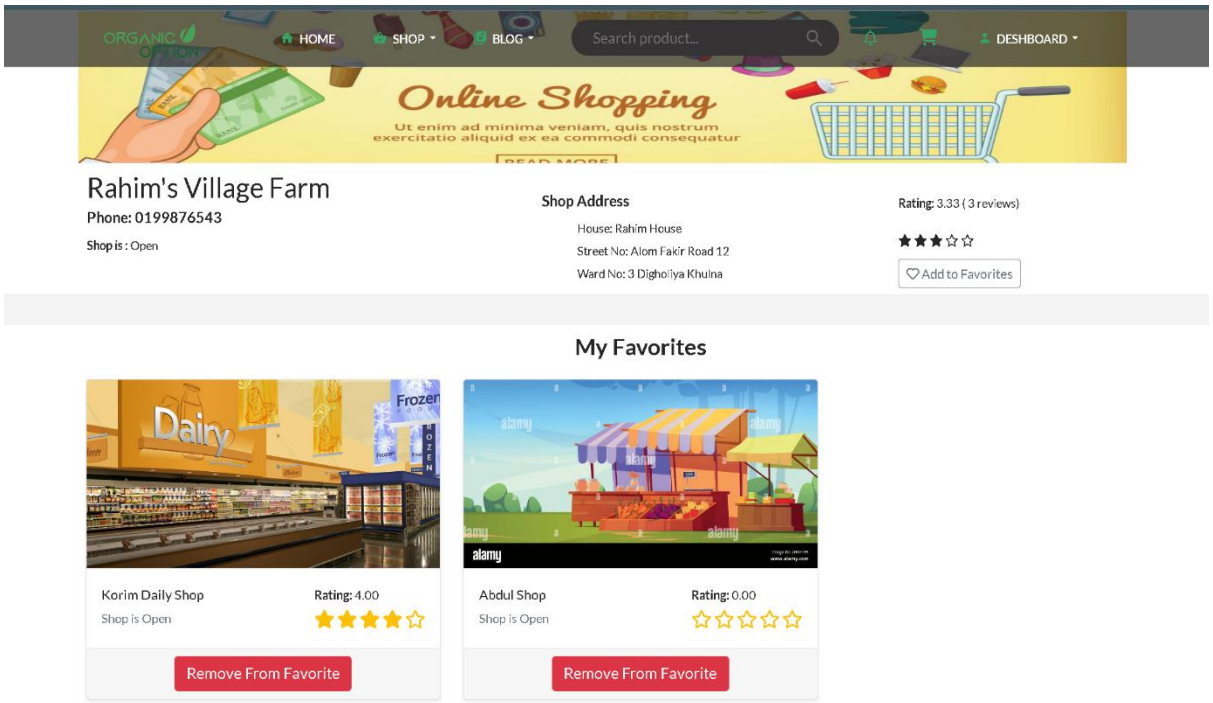


Figure 5.3.8.1 Customer Favorite management

Account and Profile: all user can edit, delete and update profile information like password, account lockout, delete account, password management and other functionalities

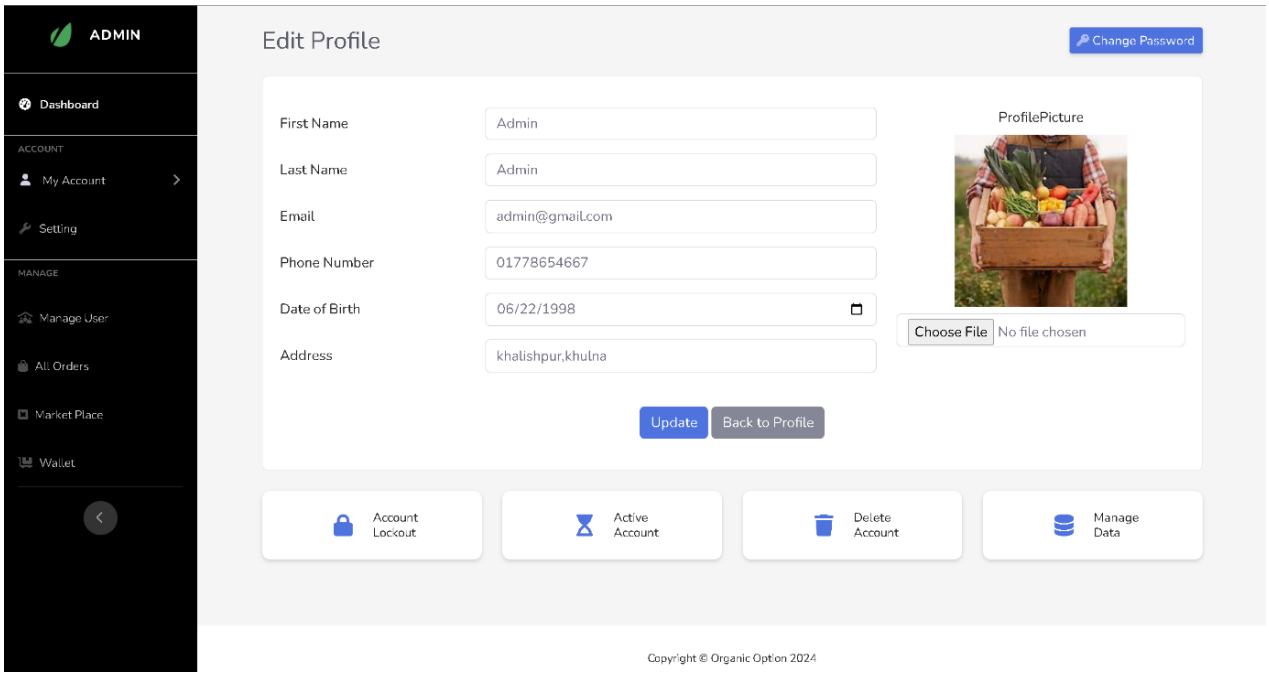


Figure 5.3.8.2 User account and Profile Management

Search and Discovery: Robust search functionality, alongside intuitive filters and sorting options, enables users to effortlessly discover local organic farms, promoting accessibility and engagement.

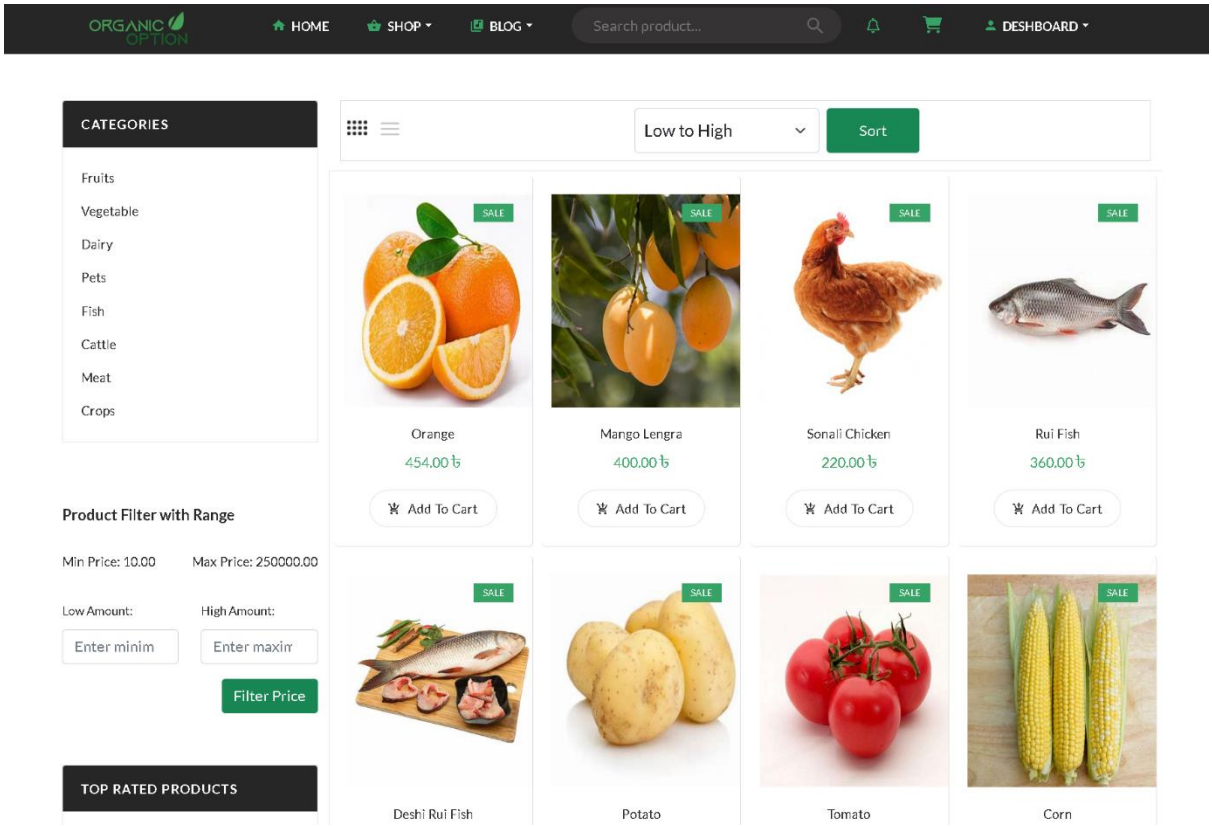


Figure 5.3.8.3 Product filtering and sorting

Notification Service:

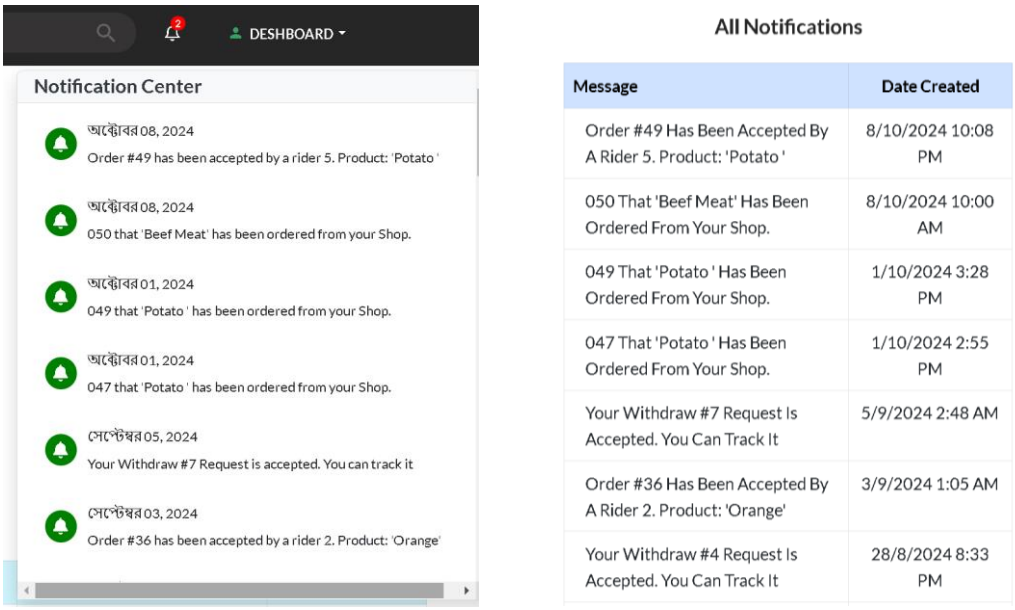


Figure 5.3.8.4 User Notification Service UI

Notification service implemented for real-time customer order update, order tracking, farmer shop order services and revenue withdrawal update for both rider and farmer. It's an important feature for more user experiences.

Feedback System: A user-driven feedback system is implemented, that allowing users to provide valuable insights on products, farms, and delivery experiences, promoting transparency and continuous improvement.

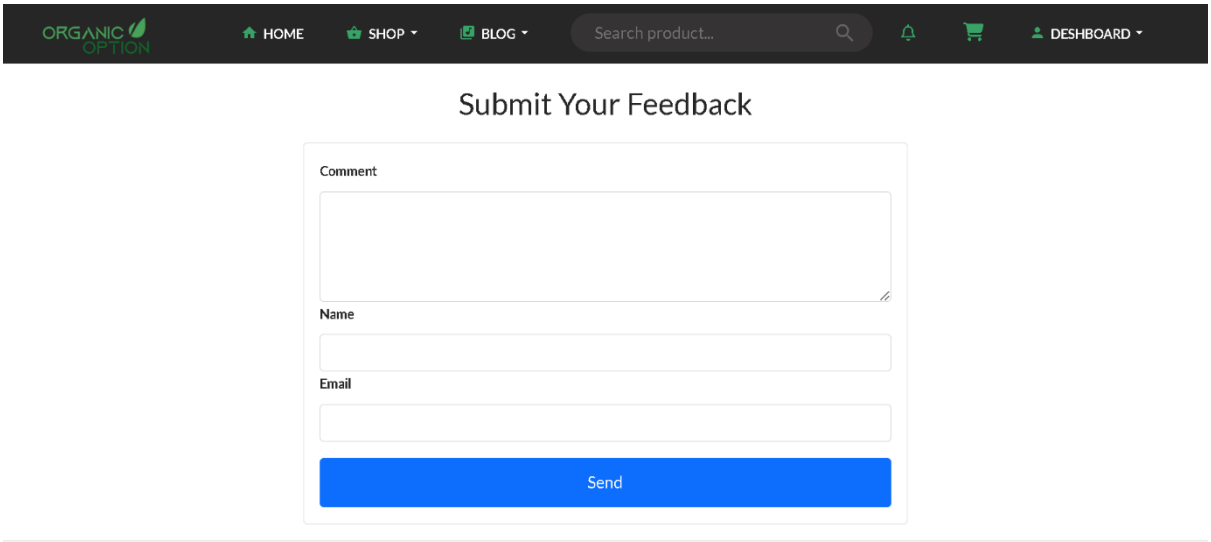


Figure 5.3.8.5 User Feedback UI

Regular Blog and Farmer AID: Regular Blog and Farmer Aid: The system offers a regular blog along with educational tools for both farmers and riders to help them adapt to digital devices.

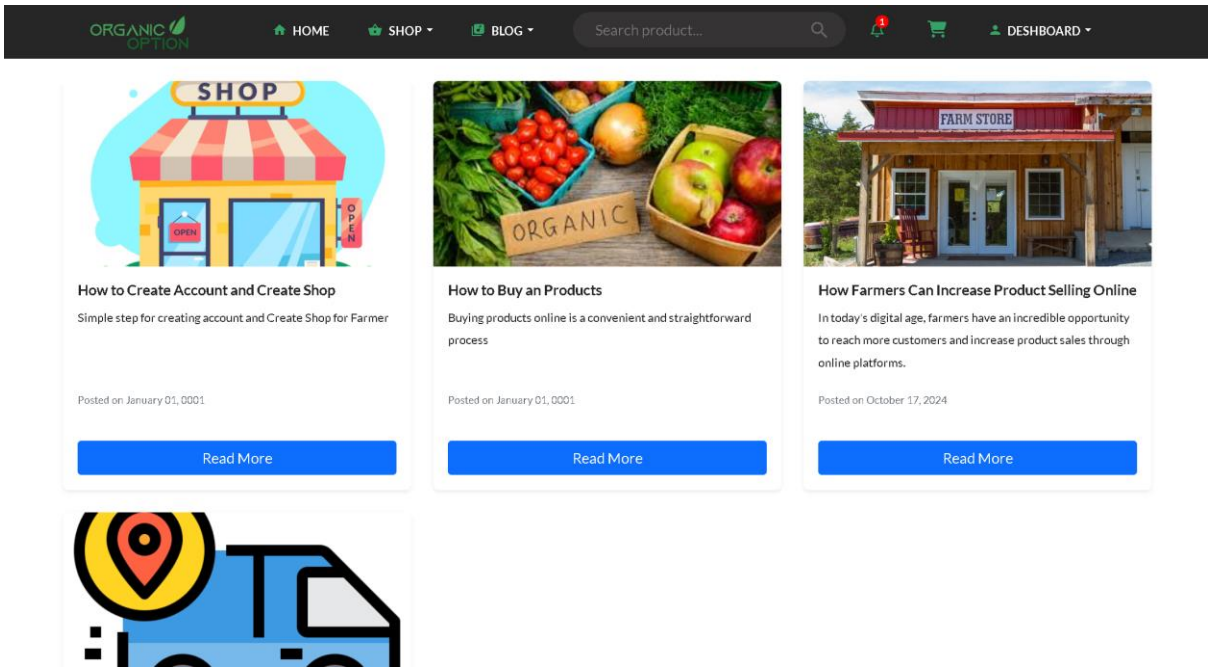


Figure 5.3.8.7 Latest Blog and Educative tools

These features assist farmers by providing guidance on increasing production and offering suggestions for addressing crop diseases and selecting appropriate medicines

Daily Product Price:

System Admin update daily product price that help both farmer and customer to knowledge of regular product price.

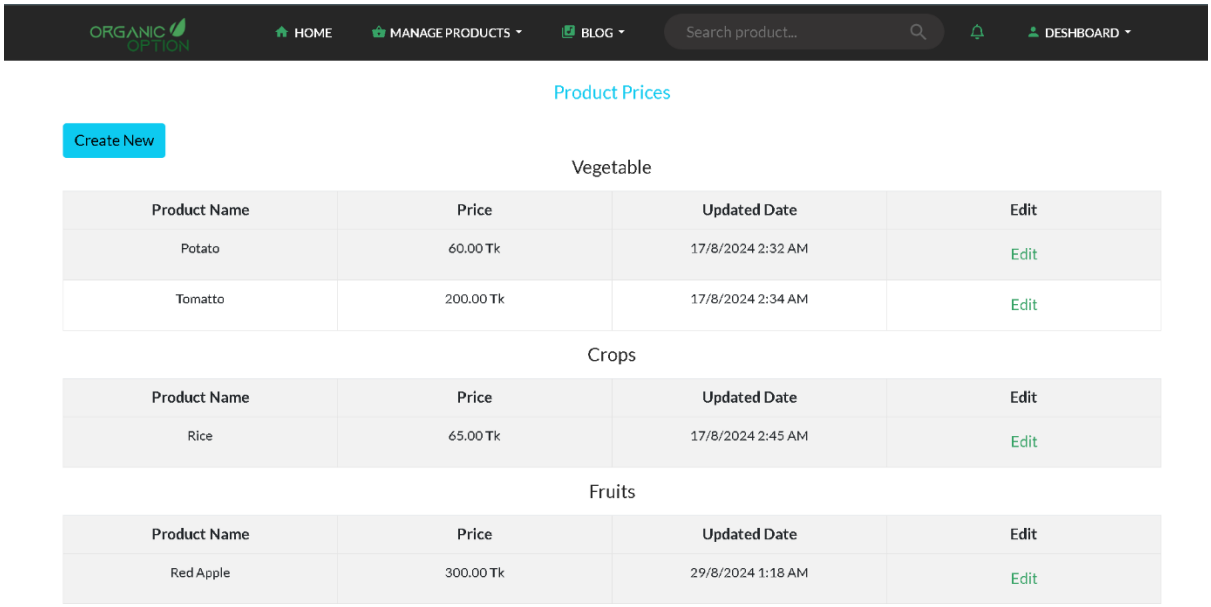


Figure 5.3.8.8 Daily Product Price

Summary of the Project

The "Organic Options" e-commerce platform was made to connect local farmers with customers. It offers an easy, efficient and eco-friendly way to connect with local farmer and sell organic products. By using modern technology, the platform helps farmers and supports local farmer and rider. Main goal of this project is digital adaption of local farmer, removing middleman that's present time syndicates and create opportunity to get Farmer proper price and work opportunity of local riders. Local customer can sell product through online as like as product sell on marketplace that helps to customer get fresh and health product from farmer.

For the platform's development, we used Microsoft SQL Server, ASP.NET Core, Entity Framework Core. We followed industry standards and best practices to ensure it works well, is secure, and of high quality.

The platform includes features like role-based user login, product management, order handling, and delivery tracking to meet the needs of customers, farmers, delivery riders, and admin.
We tested the platform thoroughly, and the results show that it works as expected and solves the problems faced by farmers and customers.

Conclusion

The successful implementation of the "Organic Options" platform modernizes the agricultural supply chain for organic farming by directly connecting customers with fresh, locally-grown products. This reduces middlemen, allowing farmers to earn more while effectively managing agricultural waste through better inventory management and digital interaction.

The platform addresses challenges faced by local farmers, customers, and middleman syndicates, offering practical solutions that boost the local economy and create job opportunities for delivery riders. By promoting organic products, it supports healthier lifestyles and tackles social and environmental issues.

"Organic Options" ensures a trustworthy, user-friendly marketplace with customer-centric features, while also addressing challenges like low digital literacy among farmers and rural infrastructure limitations. Ultimately, it advances agriculture by making it more efficient, sustainable, and beneficial for farmers, customers, and delivery riders, paving the way for future growth in the sector.