Advancing Product Traceability in Nearby Shop & Farmer-centric E-commerce Infrastructure : A Research Implementation Perspective.

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Approval

This is certify that the research project report about Advancing Product Traceability in Nearby Shop & Farmer-centric E-commerce Infrastructure submitted by Sagor Sarker (CE-19004) and NN Dipu Islam (CE-19021) to the department of Computer Science and Engineering, Mawlana Bhashani Science and Technology University, Santosh, Tangail-1902, Bangladesh, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bechelor of Science (Engineering) in Computer Science and Engineering and approved as to it's style and contents.

Board of Examiners

1…… (Supervisor)

2…… (Examiner)

3…… (Examiner)

Declaration

We hereby, declare that the project development work presented by the outcome of us under the supervision of Md. Mahfuz Reza, Associate Professor, department of Computer Science and Engineering, Mawlana Bhashani Science and Technology University, Santosh, Tangail-1902, Bangladesh. We also declare that no part of this project has been submitted elsewhere for the award of any other degree.

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Abstract

The traditional market structure often includes middlemen that drive up prices and make transactions more difficult. With the objective to promote direct relationships between producers and customers, this research project suggests an innovative method. The project employs an integrative strategy. It first makes use of the Google Maps API to locate stores in the vicinity, evaluate their offers, and filter them according to user-specified criteria like cost, star rating, and distance. Peer-to-peer transactions are facilitated by a central platform, second. There is no need for middlemen because users can upload products, determine prices, and communicate with potential consumers directly. Third, the initiative actively encourages people starting their own companies on the platform, creating an expanding marketplace and enabling people to take on economic responsibilities. Ultimately, the platform gives direct farmer-to-consumer sales priority because it understands the difficulties farmers experience in obtaining fair prices. This strategy guarantees farmers a larger portion of the sale price and gives them more influence. This project seeks to establish a more effective, transparent, and egalitarian marketplace by doing away with middlemen, encouraging entrepreneurship, and emphasizing direct connections. Not only the farmer but also the end users can get authentic product from the root level.

Acknowledgement

First and foremost, we are appreciative to God for providing us with the wisdom, drive, and endurance necessary to successfully finish the project.

We would like to sincerely thank our internal supervisor, Md. Mahfuz Reza, Associate Professor in the Mawlana Bhashani Science and Technology University's Department of Computer Science and Engineering, for his invaluable advice, insight, support, and encouragement as we conducted our research and prepared for this project. Without his support and work, we would not have been able to complete or write this project, and we owe him our Bachelor's degree.

We also appreciate Mawlana Bhashani Science and Technology University's respected computer science and engineering instructors for their unwavering support and ongoing encouragement over our years of study and during this research effort. Without them, this achievement would not have been achievable.

We would especially want to thank our friends for their support and information during this process. We are incredibly grateful to our parents for their unwavering love and support.

Preface

Chapter 1

It provides the introduction of the system. Mainly it is the opening section or beginning.

Chapter 2

It provides the project definition and requirement analysis of the system.

Chapter 3

It discusses the object-oriented design of the whole system.

Chapter 4

It discusses about technical tools of the system.

Chapter 5

It provides a detailed discussion based on the testing, security and maintenance of the system.

Chapter 6

It provides in detailed the project features and functionalities.

Chapter 7

It discusses about the limitations, future work and conclusion.

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Chapter 1

Introduction

1.1 Project Definition

Imagine a giant online marketplace where you can ditch the big companies and deal directly with the people selling the things you want. Think of it as a massive, always-open farmer's market accessible from your phone or computer.

This project cuts out the middleman by allowing anyone to sell their products directly to you, and vice versa. Looking for the best deals nearby? Search for stores and products, compare prices, and see customer reviews all in one place. The platform even encourages people to become their own boss by starting small businesses selling their creations or finds. But it doesn't stop there - this project has a special focus on helping farmers get a fair price for their crops by connecting them directly with you, the consumer.

1.2 Motivation

The current market in our country is choked by powerful syndicates that dictate what's available and for how much. These middlemen leech profit while contributing little, leaving farmers with a pittance for their crops and discouraging young people from entering the field. Consumers, meanwhile, are stuck with limited options, inflated prices, and potentially stale products that have lingered in storage. This situation is unacceptable.

Our project is driven by a desire to smash this system and empower both producers and consumers. We envision a marketplace that's direct, transparent, and fair. By connecting farmers directly with you, the customer, they'll receive a larger slice of the pie, revitalizing agriculture. You'll benefit from fresher, more authentic products that haven't languished in warehouses. This online platform will be accessible to everyone, regardless of physical limitations, offering a wider variety of products at competitive prices. It even encourages people to become micro-entrepreneurs, selling

their own creations and fostering a more diverse marketplace. This isn't just about buying and selling; it's about building a fairer and more efficient economic system that benefits everyone.

1.3 Objective

 Increase farmer profits: By eliminating middlemen, the project aims to ensure farmers receive a significantly larger share of the final selling price for their crops and produce.

 Enhance product quality and freshness: By reducing the time products spend in storage and transportation through middlemen, the project aims to deliver fresher, higher-quality goods directly from producers to consumers.

 Improve accessibility and convenience: The project aims to create an online platform that provides a user-friendly way for people of all ages and abilities to access a wider variety of products at competitive prices, regardless of their physical limitations.

 Foster entrepreneurship and economic empowerment: The project aims to encourage individuals to become micro-entrepreneurs by providing a platform to sell their own products and services, stimulating economic activity and creating new business opportunities.

 Disrupt and dismantle existing market control: The project aims to challenge the dominance of powerful syndicates in the market by creating a more direct and transparent system that empowers both producers and consumers.

1.4 Related Work and Comparison

Topic	Daraz	ChalDaal	PandaMart	Our App
Large Network	Yes	Yes	Yes	No
Big Inventory	Yes	Yes	Yes	Not necessary
Business Model	B2B and B2C	B2B and B2C	B2B and B2C	D2C
Overpricing	No	Yes	Yes	No
Commission on Sales	Yes	Yes	Yes	No
Known Source of Product?	No	No	No	Yes
Many vendors to Buy?	Yes	No	No	Yes
Can Farmers sell?	No	No	No	Yes
Reference	[1]	[2]	[3]	[4]

Table 1: Comparison between Platforms

Chapter 2

Project Definition and Requirement Analysis

2.1 Project Definition

This project targets the root level farmer's to get their fair price. It ensures the fair price for both the customer and the seller.

This project cuts out the middleman by allowing anyone to sell their products directly to you, and vice versa. Looking for the best deals nearby? Search for stores and products, compare prices, and see customer reviews all in one place. The platform even encourages people to become their own boss by starting small businesses selling their creations or finds. But it doesn't stop there - this project has a special focus on helping farmers get a fair price for their crops by connecting them directly with you, the consumer.

2.2 Project Model Analysis

There are some business models available in the current market. Lets discuss about them first-

2.2.1 B2B (Business to Business)

B2B refers to businesses that sell products or services to other businesses. This could involve selling raw materials, components, or finished products that are used in the production of goods or services by another company. B2B transactions often involve larger order quantities, longer sales cycles, and more complex decision-making processes compared to B2C transactions. Key characteristics of the B2B model include relationship-driven sales, customized solutions tailored to business needs, and a focus on efficiency and cost-effectiveness. Examples of B2B companies include manufacturers, wholesalers, distributors, and service providers that cater to businesses rather than individual consumers.[5]

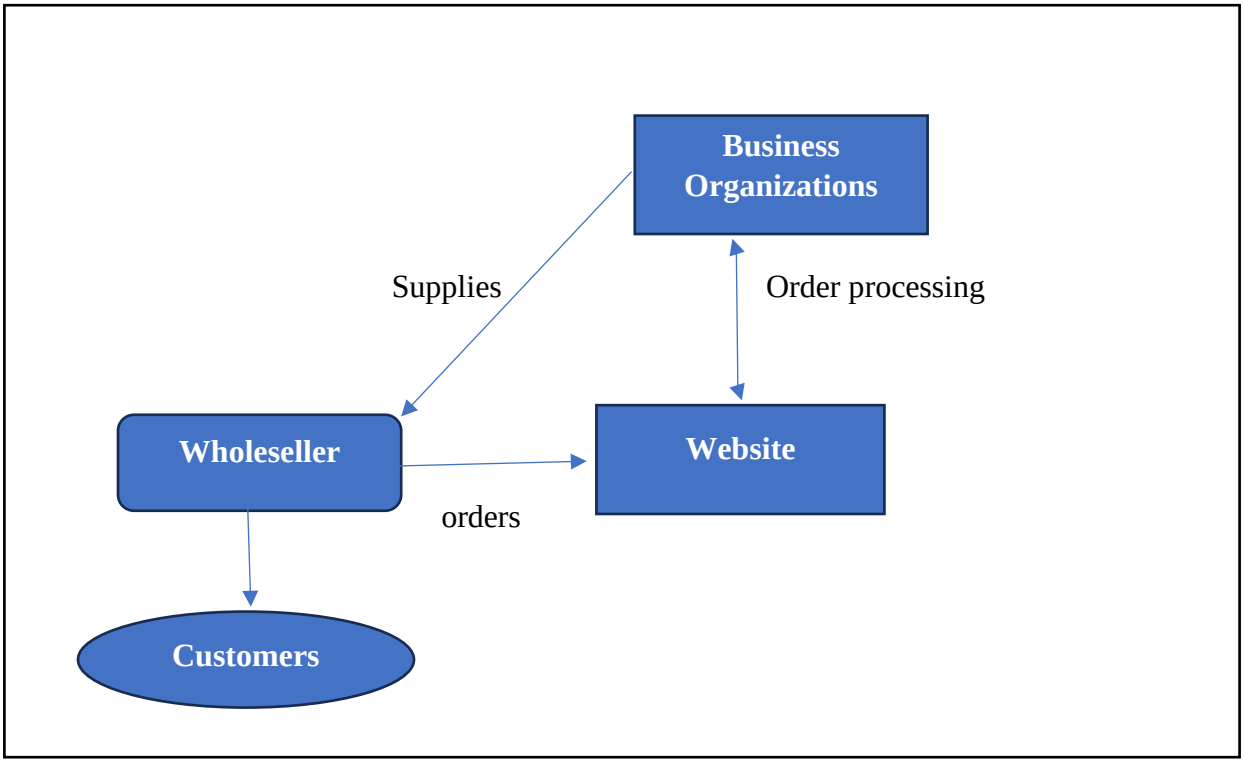


Figure 1:B2B Model

2.2.2 B2C (Business to Consumer):

B2C refers to businesses that sell products or services directly to individual consumers. This is the most common type of commerce that individuals engage in daily, such as shopping at retail stores, buying from online marketplaces, or subscribing to streaming services. B2C companies typically focus on mass marketing, brand awareness, and delivering a positive customer experience to attract and retain individual customers. They may utilize various channels such as e-commerce websites, physical retail locations, social media, and advertising to reach their target audience. Examples of B2C companies include retailers, e-commerce platforms, entertainment companies, and consumer goods manufacturers.[6]

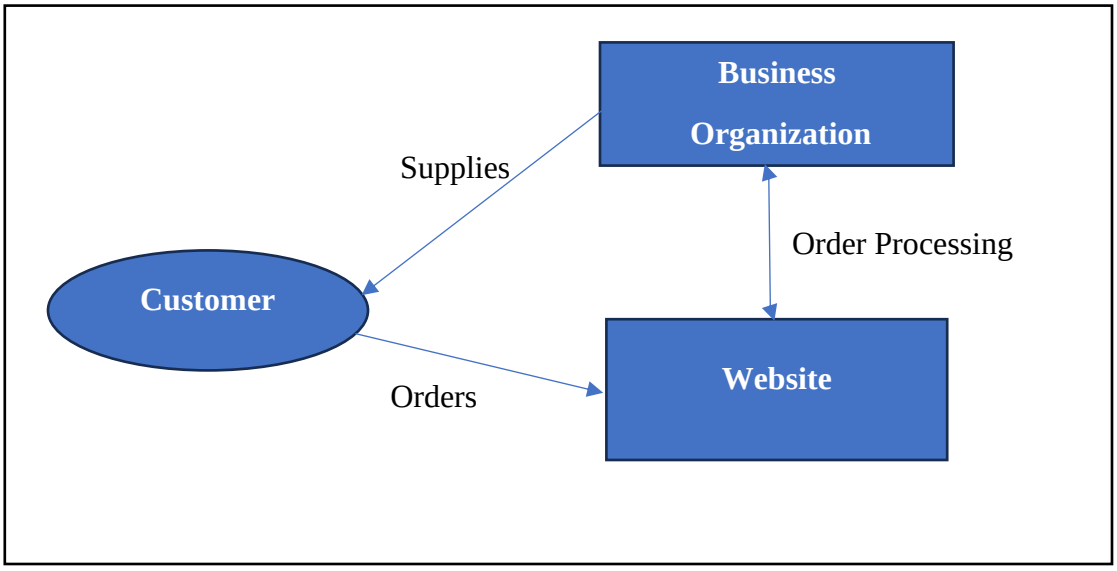


Figure 2:B2C Model

2.2.3 D2C (Direct to Consumer):

D2C is a subset of B2C and refers specifically to businesses that bypass traditional retail channels and sell their products or services directly to consumers. D2C brands typically leverage e-commerce platforms, social media, and digital marketing channels to reach and engage their target audience. By selling directly to consumers, D2C companies can have greater control over their brand, customer experience, and pricing strategy. This allows them to build direct relationships with customers, gather valuable data and feedback, and adapt quickly to changing consumer preferences. D2C brands often focus on delivering high-quality products, personalized shopping experiences, and authentic brand storytelling to differentiate themselves in the market. Examples of D2C companies include digitally native brands in various industries such as fashion, beauty, wellness, home goods, and food and beverage.

We are introducing D2C business model in the market which is currently not available in any of the e-commerce site.

Adding a Direct-to-Consumer (D2C) model to our online store is a big move that comes with lots of benefits for our brand. Instead of going through middlemen, we'll sell our products straight to customers. This gives us more control over how people experience our brand—from the moment they check out our website to when they get their order. We can make sure every step feels just right and matches what we stand for. Plus, selling directly lets us build stronger connections with our customers. We can chat with them, learn what they like, and use that info to make our products even better. With all the data we'll collect, we can make smarter decisions and keep up with what's

trending in the market. Going D2C opens up exciting new possibilities for growing our business and standing out from the crowd in online shopping.[7]

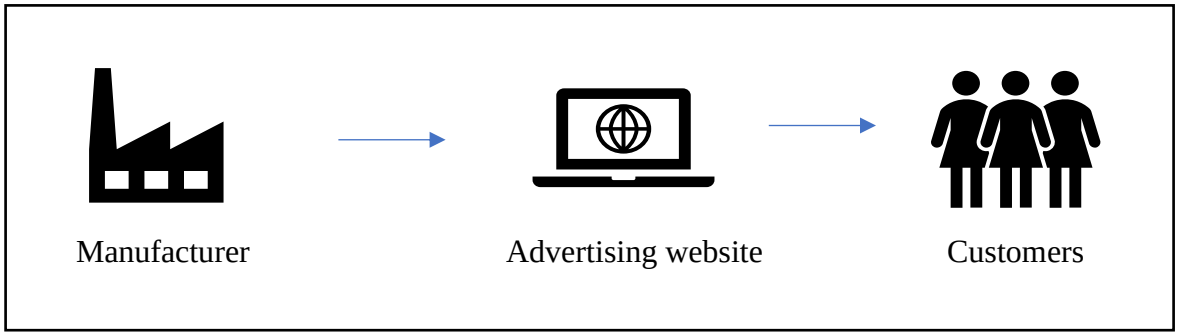


Figure 3:D2C Model

2.3 Difference Between Business Models

Feature	B2B	B2C	D2C
Target Market	Businesses	Individuals	Individuals
Sales Channels	Sales representatives, distributors, e-commerce platforms.	Retail stores, online marketplaces, e commerce platforms.	Own websites, mobile app, limited retail presence.
Sales volume	Higher per transactions.	Lower per transactions but higher overall volume.	Varies to the customer
Customer Relationship	Long-term relationship based.	Transactional/repeat customer based.	Direct, focused on customer experience.
Pricing Strategy	Negotiable, volume based discounts.	Competitive pricing, promotions.	Value based pricing.

Table 2:Comparison between models

2.4 Project Purpose

The goal of this project is to shake up the way things are done in our country's markets. Right now, powerful middlemen control what's for sale and how much it costs. They take a big chunk of the profit without doing much, leaving farmers with barely anything for their hard work. This discourages young people from going into farming, and you, the customer, end up paying more for products that might not even be fresh.

We want to change that. This project is about creating a marketplace where farmers can sell directly to you, so they get a fair price and you get fresher stuff. It'll also be an easy-to-use online platform, so everyone can shop from a wider variety of products at competitive prices, no matter their age or ability. But that's not all! The platform will also encourage people to start their own small businesses, selling their own creations or finds. It also makes our daily shopping easier and effortless. By the location based shops you can compare them and select the best shops for you. Even in a rainy day or shiny day, you can buy your product easily. In short, this project isn't just about buying and selling; it's about building a system that's fair and good for everyone involved.

2.5 Project Scope

The project scope outlines the specific features, functionalities, and deliverables that will be included in the development of our app. The overview of the project scope is given below:

- **Registration:** In the user registration feature user can do registration by his email to build his login account to access the app. He can directly signup using the gmail api.
- **Login:** In login system, user can log in by his registered email and password to access the app.
- **Forget password:** You can reset your password if you have forgotten it.
- **Homepage:** In the homepage you can see the main features of our app.
- **Edit Profile:** Edit your profile to keep your shop up to date.
- **Start New business**: You can start your own business if you have any scope of business. Just upload your product and if you have a good price for the customer, the customer will knock you soon.
- **Upload Product**: Anyone can upload their own product very easily.
- **Marketplace:** This is a virtual market where you will get the authentic product from every corner of our country and in a very good price. Just find the best priced product for you.
- **Search and filter:** These features makes our life easier. By these features we can find our desired product easier and effortlessly.
- **Order Items:** You can order items from a particular shop.
- **Cart:** Check what you want to buy in the cart.
- **Setting:** Customize your app from here.

- **Logout:** You can logout from the app when you are done.

2.6 Requirements

For creating this website some requirements are needed. We provide these requirements in three parts. These are:

- Project Requirements
- Software Requirements
- Hardware Requirements

Project Requirements	Software Requirements	Hardware Requirements
Complete development Diagram	Language: Flutter (Frontend) Laravel(Backend) , Firebase(Auth)	CPU: Pentium 4 Or upper version
Complete Source code and run files for the frontend and backend	Database: MYSQL	Ram: 2 GB or upper
Complete database design.	IDE: VS code	HDD: As much as large so that contains a big amount of data

Table 3: Requirements

2.7 System Analysis

The system architecture phase lays the groundwork for a successful development process. It defines the number of layers (client-server or otherwise) and the structure of different tiers, including the user interface, data storage (database design), data organization (data structures), and application logic (package architecture). This phase is crucial because flaws identified later can be expensive to fix. The user interface, as the point of interaction for users, is particularly important. It should provide clear screens for navigation, data entry forms, and report generation.

2.7.1 Analysis Model

This document is important to the software development life cycle (SDLC) as it records all of the application's requirements.[8]

There is more analysis of the construction codes that are applied to structures via the load combination technique. It is applied to load-bearing and structural behavior analysis as well as design. It is meant for use by developers and acts as the foundation for the testing process. Any changes to the requirements in the future will require official change authorization procedures. The Agile Model was advised for iterative development.[9]

An iterative development approach to software development is called an agile paradigm. Agile techniques divide work into manageable chunks, or portions that don't directly require long-term planning.

In the Agile process model, an iteration is a small time "frame" that usually lasts one to four weeks. By breaking the project up into smaller components, the overall project delivery time requirements are decreased and project risk is minimized. The basic steps for the Agile model can be re-factored as follows:

- The requirements of the users for the software are gathered and prioritized.
- A plan is created for delivering the software, including the features that will be delivered in each iteration.
- Building of the software is done using frequent and rapid iterations.
- The software is thoroughly tested to ensure that it meets the user's requirements and is of high quality.

- ❖ The software is deployed and put into use.
- ❖ The software is maintained to ensure that it continues to meet the customer's needs and expectations.

2.7.2 Graphical User Interface

The interface was created with a graphical idea in mind, connected through a interface, in order to maximize the flexibility of uses. A GUI is a software interface that makes use of the visual capabilities of the computer to make the application easy to use. Many users find this feature more productive. Vibrant colors, captivating graphics, illustrations, and icons were employed for the visual design of the website. A consistent visual style has been maintained throughout the website for a cohesive and polished look. The main features are designed in the homepage so that a user can easily access them. The products are shown along with pictures to make the interface more attractive and clear.

2.7.3 Number of modules

The following modules will be displayed after the application has been completed. We have a user module and admin module in this application.

Users Modules

- Log in
- Sign up
- Start new business
- Search store in the app
- Check the items in the shop
- Compare shops
- Check the products in the marketplace
- Filter and search products

- Order items
- Edit profile
- Upload any item
- Logout

Admin Modules

Admin has overall control of the system

- To manage user accounts including registration and log in
- To manage and store product information
- To store both response of users and user’s information

2.8 System Planning

To bring this project to life, we'll leverage a well-designed app that prioritizes user experience. The app will employ location services to discover nearby shops and products that match your searches. Design principles like clear information hierarchy and intuitive navigation will ensure a smooth user journey. For price comparisons and informed decision-making, we'll incorporate a model-view-controller (MVC) design pattern to separate data, user interface, and business logic. Looking to sell? The app will utilize a user-centric design approach, allowing sellers to effortlessly upload products, set prices, and connect directly with customers. Thinking of becoming a micro-entrepreneur? The app will follow established e-commerce design patterns to streamline your business setup. Security will be paramount, with robust features to safeguard transactions. For seamless purchases, we'll integrate with popular payment gateways following industry best practices. Finally, the app will embrace an iterative design process, incorporating user feedback through regular updates to ensure it remains fresh and relevant.[10]

2.9 Feasibility Study

A feasibility study employs comprehensive investigation and research to assess and scrutinize the project's viability, furnishing decision-makers with comprehensive data. A feasibility study seeks to rationally and impartially determine the benefits and drawbacks of a proposed or ongoing commercial endeavor, as well as the opportunities and hazards presented by the surrounding environment, the resources required to proceed, and, ultimately, the probability of success. To put it simply, the two elements that go into determining feasibility are the value to be realized and the cost necessity.

A description of the good or service, accounting statements, details about the operations and management, marketing research and policies, financial data, regulatory requirements, and tax obligations should all be included in the historical context of the business or project. In general, feasibility assessments come before project implementation and technological development.

2.9.1 Technology and System Feasibility

In order to identify whether the organization has the necessary technical know-how to manage the project’s completion, the evaluation is based on an outline design of the system requirements. It is important to keep the following things in mind while preparing a feasibility[11] report:

- A brief description of the business to assess more possible factors which could affect the study.
- The part of the business being examined.
- The human and economic factors.
- The possible solutions to the problems.

The question at this stage is whether the plan is practical from a technological and legal standpoint.

2.9.2 Operational Feasibility

Operational feasibility assesses how well a proposed system aligns with an organization's goals and capabilities. It considers if the system effectively addresses identified problems and

opportunities, and if it meets the requirements defined during the planning stages. This evaluation also includes gauging management's commitment to the project, as their support is crucial for successful implementation and user acceptance within the organization.[12]

2.9.3 Economic Feasibility

The project's benefits and costs are examined in the economic feasibility study. This feasibility study essentially carries out a thorough review of the project's development costs, including the cost of design and development, the resources needed for hardware and software, and so forth. The next step is to determine whether or not a project will benefit the company financially. Each of the expected benefits is recognized and measured. A cost-benefit analysis is frequently included in this assessment.[13]

2.9.4 Technical Feasibility

Technical feasibility involves developing a project by analyzing available hardware and software resources in addition to necessary technology. This study provides a report on the availability of the technology and resources needed to develop the project. A feasibility study also examines other factors, such as whether or not to employ current technology, whether or not maintenance and upgrades are simple for the selected technology, and the technical expertise and capabilities of a technical team. We built our app with the most up-to-date technologies possible to make it functional for modern users.

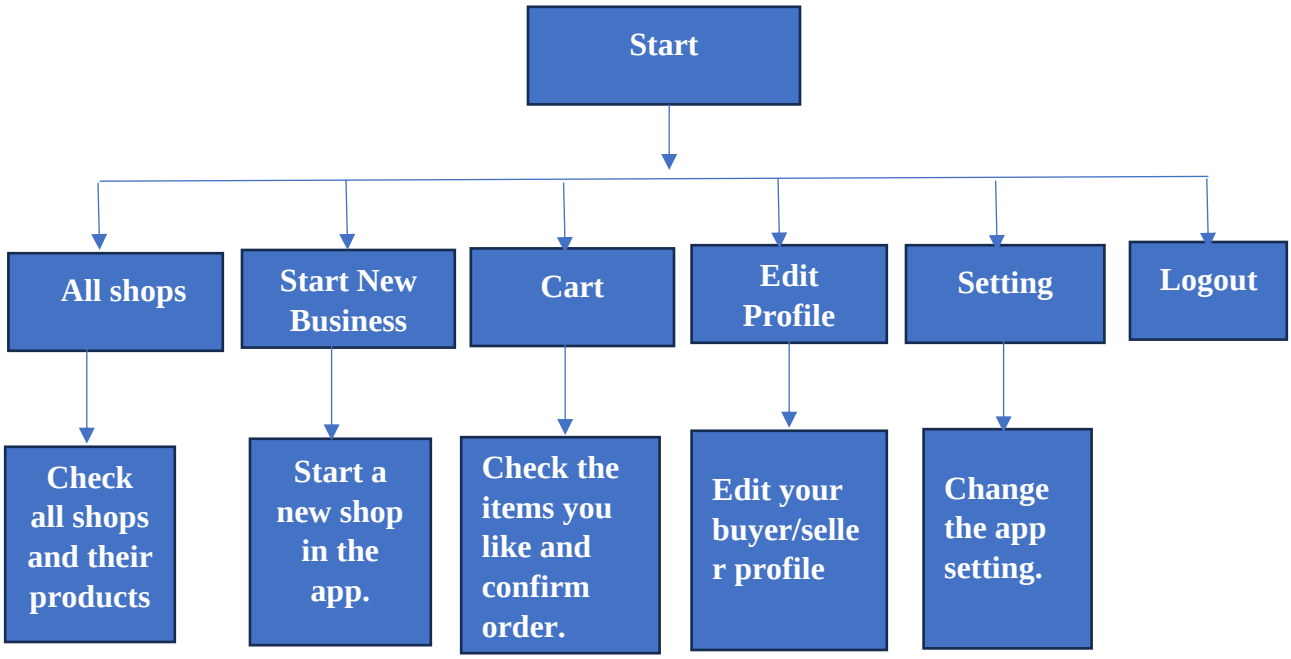
Chapter 3

Methodology

3.1 Design Specification

A design specification is a plan or a blueprint that describes how the software program should be designed and a block system diagram describes how the software work. It helps developers create software which is well-structured, easy to understand and maintain, and which meets the requirements of the stakeholders. There is design specification in Object Oriented Programming.

3.2 Overview Of Project



3.3 Flow Chart

A flowchart[14] is like a picture that shows how things happen step by step. It's used to plan and understand how a program or process works. People often use it in software development to organize their ideas and show how different parts of a program connect. Flowcharts help us explain how something works to others, making it simpler to understand and solve problems. They're

handy for breaking down big problems into smaller steps and figuring out the best way to solve them. Here is the flow chart of our program in below:

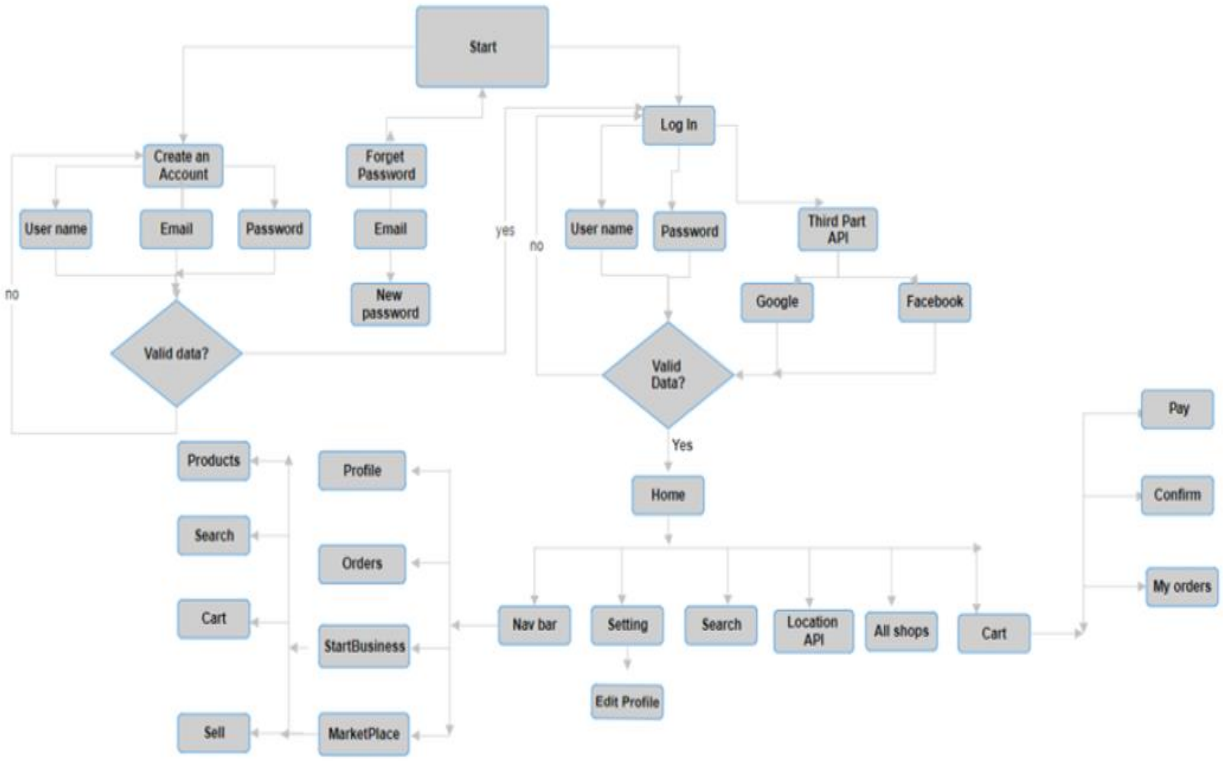


Figure 4:Project Flow Chart

3.4 Use Case Diagram

A use case diagram is like a picture that shows how people or other things use a system. It's a way to see all the different things that a user can do with a system, like logging in or making a purchase. Actors, which can be people or other systems, are shown interacting with the system through these actions. Use case diagrams help us understand what a system needs to do from the perspective of its users. They're made at the beginning of building a system to figure out what it should do and how people will use it.[15]

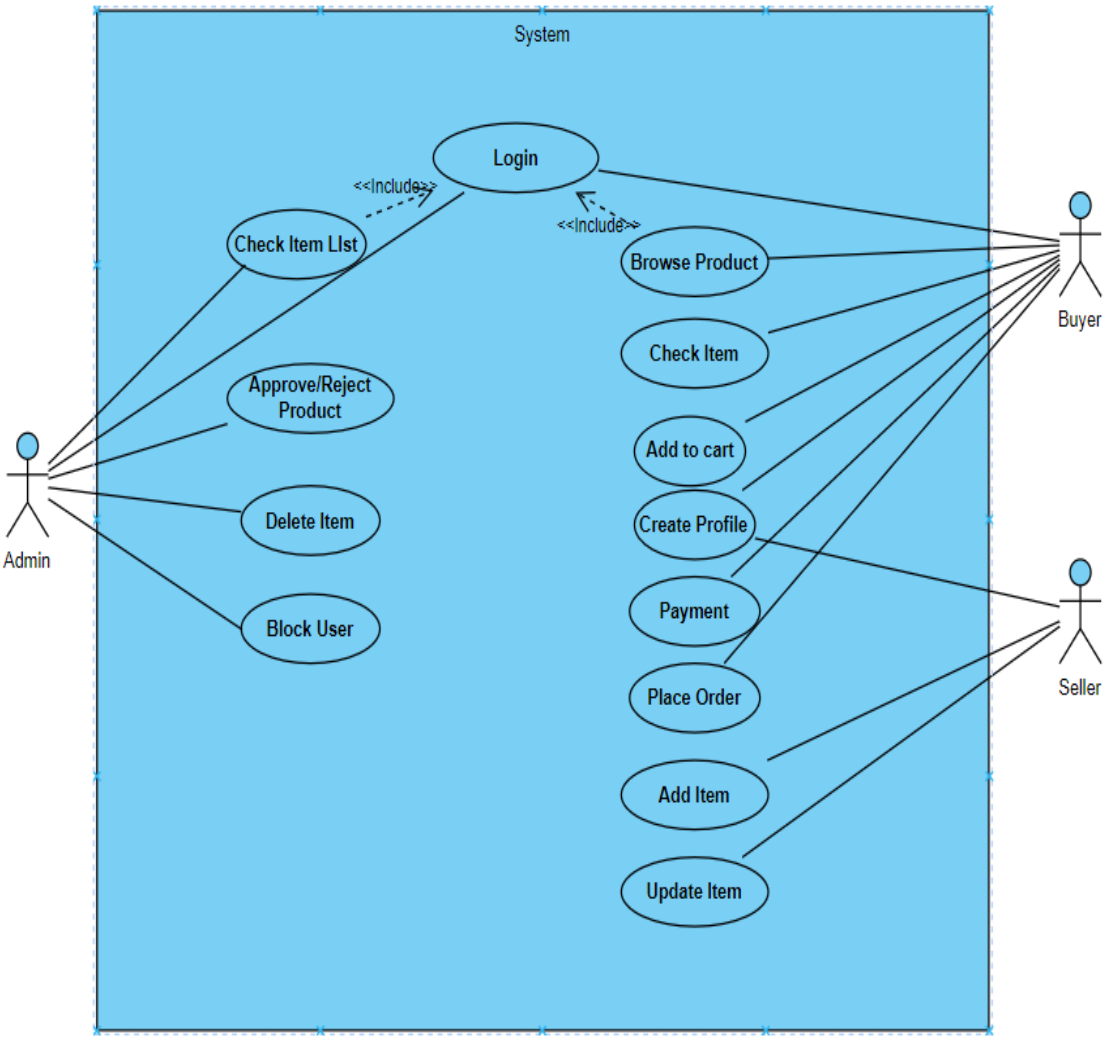


Figure 5: Use Case Diagram

3.5 Class Diagram

A class diagram is like a visual blueprint that shows the different parts of a system and how they work together. It uses boxes to represent classes or objects and lines to show how they relate to each other. These diagrams help us understand the structure of a system and how its parts interact. They show what each part does and how they communicate with each other. Class diagrams are useful for planning and designing software because they make it easier to see how everything fits together.[16]

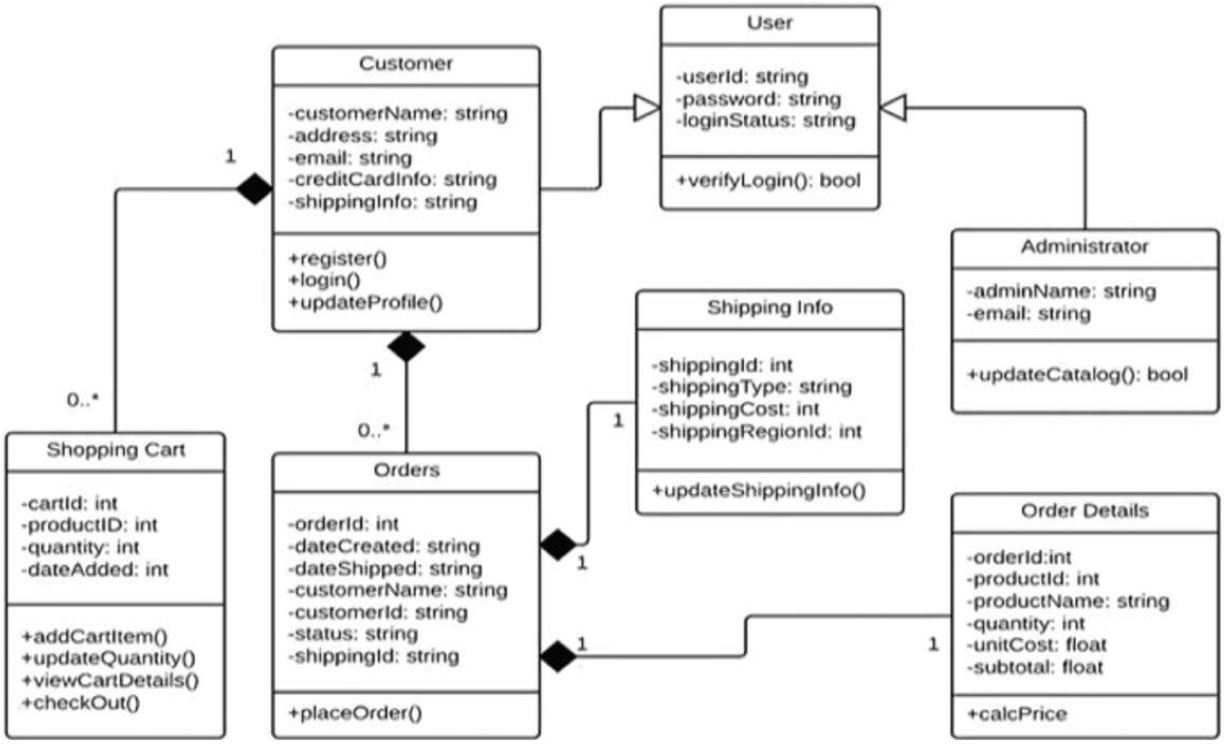


Figure 6:Class Diagram

3.6 The Front end users will have following features

❖ Authentication

- Sign Up
- Log In
- Forget Password
- Login with third party API

❖ Home

- Checkout Nearby Shops
- Marketplace
- Create Business Account
- Edit profile
- Setting
- Cart

- **Marketplace**
    - Checkout Items
    - Compare Products
    - Add item in the cart
    - Check Price
    - Check shop rating
    - Search Item
    - Filter Item
- **Checkout Nearby Shops**
    - Compare Shops
    - Search Shop
    - Check product and price in the shop
    - Order items
    - Check orders
- **Start New Business**
    - Create new business account
    - Upload your products
- **Edit Profile**
    - Update Shop name
    - Update Phone number
    - Update item prices
    - Update item lists
- **Setting**
    - Change language
    - Logout

Chapter 4

Technical Tools

4.1 Frameworks and IDE

4.1.1 Vs Code

VS Code is a computer program you can use to write code on your computer. It helps you write code more easily by suggesting things as you type. It's free to download and use, which is pretty cool. You can make it look and work the way you want by adding stuff to it. Lots of people like it, but if it's not your cup of tea, that's okay too!It has a huge library of extensions that helps to develop anything very easy and effortlessly. We used vs code as out primary IDE.[17]

4.1.2 Flutter

We used Flutter framework as our frontend development. Flutter is a very useful technology to build front end in a cross platform manner.[18]

Google created the user interface (UI) toolkit Flutter to enable developers to create natively built desktop, web, and mobile applications from a single codebase. It makes use of the Google-developed Dart programming language. With Flutter, developers can create stunning, seamless user experiences because to its extensive collection of customizable widgets and layouts. With its hot reload feature, developers may view changes right away without having to restart the application. Flutter apps have excellent performance and fluid animations since they are built to native ARM code for the iOS and Android operating systems. Its reactive foundation makes it simple and effective to design sophisticated user interfaces. Flutter's layered architecture allows for seamless integration with platform-specific code, enabling access to device features and APIs. It has extensive documentation and a supportive community, making it easier for developers to learn and troubleshoot. Flutter's popularity has been growing rapidly due to its efficiency in app development and its ability to deliver consistent experiences across different platforms. With Google's backing and continuous updates, Flutter is positioned as a leading choice for cross-platform app development in the future.

4.1.3 Laravel

We used Laravel framework for our backend development.

A PHP framework called Laravel is used to create online apps. It offers developers a range of features and tools to accelerate and improve the effectiveness of web development. Its clean syntax, which makes routine operations like routing, authentication, and database interfaces easier, is one of its primary characteristics. Since Laravel adheres to the Model-View-Controller (MVC) architectural pattern, it is simple to distinguish between presentation and logic. It has a robust Object-Relational Mapping (ORM) tool called Eloquent, which maps database tables to PHP objects to streamline database administration. Laravel also includes features like Blade templating engine for creating reusable views and artisan command-line interface for automating tasks. Its built-in support for testing helps developers ensure the quality and stability of their applications. With a vibrant community and extensive documentation**,** Laravel is a popular choice for both beginners and experienced developers alike.[19][20]

4.1.4 Firebase

We used firebase framework for our primary authentication.

Firebase is a mobile and web application development platform acquired by Google. It offers a suite of tools and services to help developers build, improve, and grow their apps. With Firebase, developers can easily set up authentication, real-time database storage, and cloud messaging for their applications. It provides hosting services for deploying web applications quickly and securely. Firebase also offers analytics and performance monitoring tools to help developers understand user behavior and optimize app performance.[21]

4.2 Languages

To create dynamic and interactive websites and web applications languages is essential for developers. Different languages serve different aspects of web development.

4.2.1 DART

Dart is a programming language developed by Google, known for its versatility and efficiency. It's primarily used for building web, mobile, and server applications. Dart's strong typing system and Just-in-Time (JIT) compiler ensure fast performance and robust error checking during development. It supports both object-oriented and functional programming paradigms, making it flexible for different coding styles. With Flutter, Google's UI toolkit, Dart has gained popularity as a preferred language for cross-platform app development.[22]

4.2.2 PHP

PHP is a popular server-side scripting language used for web development. It's known for its ease of use and broad compatibility across different platforms. PHP enables developers to create dynamic and interactive web pages by embedding code directly into HTML. With a vast ecosystem of libraries and frameworks like Laravel and Symfony, PHP offers solutions for various web development needs. It's open-source and constantly evolving, with a dedicated community contributing to its growth and improvement. Despite criticisms, PHP remains a staple in the web development world, powering millions of websites and applications.[23]

4.2.3 MySQL

For the creation and management of our databases, we used MySQL extensions. A popular open-source relational database management system (RDBMS) for managing and storing data is called MySQL. It is a well-liked option for web applications and other software projects due to its reputation for dependability, scalability, and simplicity of use. SQL, or structured query language, is used by MySQL to manage and manipulate data in its databases. It offers flexibility in data

management and performance optimization by supporting several storage engines. MySQL can manage a wide range of workloads, from small-scale applications to enterprise-level systems, thanks to features like replication, clustering, and high availability options.[24]

Chapter 5

Testing, Security and Maintenance

5.1 Methodology used for testing

Testing an application involves several sequential phases aimed at ensuring its functionality, usability, security, and performance. Initially, unit testing verifies individual components or modules of the application, ensuring they function correctly in isolation. Integration testing follows, where these components are combined and tested together to ensure they interact seamlessly. System testing then evaluates the application as a whole in a simulated real-world environment, ensuring it meets all specified requirements and operates smoothly. Acceptance testing involves stakeholders or end users testing the application to ensure it meets their expectations and needs. Regression testing ensures that previous functionalities remain intact after updates or changes are made. Additionally, performance testing evaluates the application's speed, responsiveness, and stability under various conditions, while security testing identifies and addresses potential vulnerabilities. Together, these phases ensure that the application is reliable, user-friendly, and secure before it is deployed to users.

5.2 Testing Methods

Application testing is a software testing to test websites and applications to identify potential bugs before it is accessible to the user. In software testing there are two methods which are black-box testing and white box testing. These two methods are describe the testing results from the point of view of those methods.

5.2.1 Black box testing

An internal testing system is called black box testing. However, it is unable to access the software's internal workings or source code. The purpose of the testing, which is based on the requirements and specifications of the system, is to confirm that the system functions as intended and generates the desired outcomes when given various inputs. It can be applied to three main types of tests those are: functional, non-functional, and regression testing.[25]

There are various test case design techniques applied for black-box testing:

- Boundary Value Analysis
- Equivalence partitioning
- State Transition Testing
- Decision Table Testing
- Graph-Based Testing
- Model-based Testing
- Error Guessing Technique

5.2.2 White box testing

White box testing provides tester with complete knowledge of the application being tested, including access to source code and design documents. It is also an internal structure, design, and coding are tested to verify input-output flow and improve design, usability, and security. In this testing codes are visible that's why it is also called Clear box testing, Open box testing, Transparent box testing, Code-based testing, and Glass box testing.[26]

White Box Testing is coverage of the specification in the code:

- Code coverage
- Segment coverage
- Branch Coverage or Node Testing

- Compound Condition Coverage
- Basis Path Testing
- Data Flow Testing (DFT)
- Path Testing
- Loop Testing

5.3 Security

Web security refers to protecting networks and computer systems from damage to or the theft of software, hardware, or data. The purpose of website security is to prevent any sort preventing unauthorized users from accessing, using, modifying, destruction or disruption. This project contains high level of security as a software system required. The project system has two types of users as admin and those user who can use the website.

5.4 Maintenance

Maintenance is the process it keeps a website up-to-date and running smoothly as well as performing. It is the last stage of software development life cycle. Software maintenance can be used when the software delivered like correction, bug fix, performance increase. It is based on the real world changes that's why when the real world changes it needs to change the model software. There are several causes for why software might require maintenance. Market conditions, client needs, host needs, changes in organizational structure, or even the requirement to restore the product to its original state. Therefore, the goal of software maintenance is to fix bugs after delivery and upgrade software programs as demand changes as a result of changes in the actual world. There are four types of maintenance based on the size and nature:

Corrective Software Maintenance: Corrective software maintenance focuses on fixing software flaws, errors, and defects.

Adaptive Software Maintenance: The goal of adaptive software maintenance is to modify software in response to environmental changes.

Perfective Software Maintenance: Perfective software maintenance is concentrated on functions that enhance the user experience.

Preventive Software Maintenance: The goal of preventive software maintenance is to modify and adapt software to lessen the likelihood of deterioration.

Chapter 6

Project Features and Functionalities

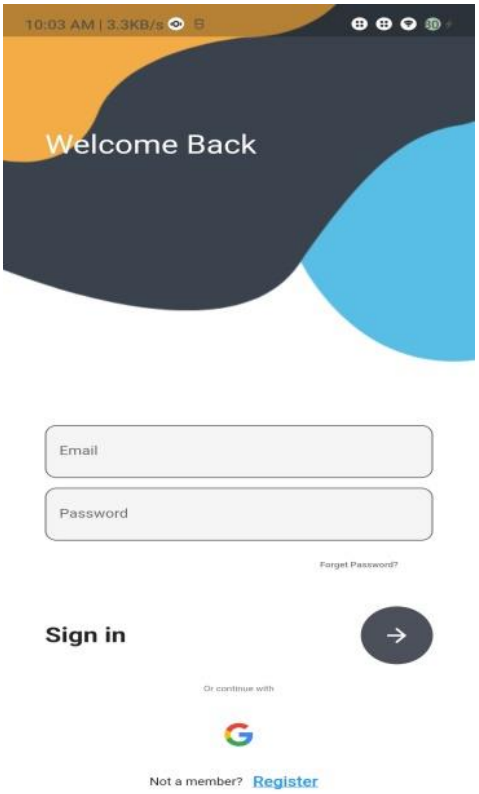


Figure 8:Login Page

From this page user can login to our app and can use the services.

Figure 7:Sign Up page

If an user don't have a account the user can signup here and create a account.

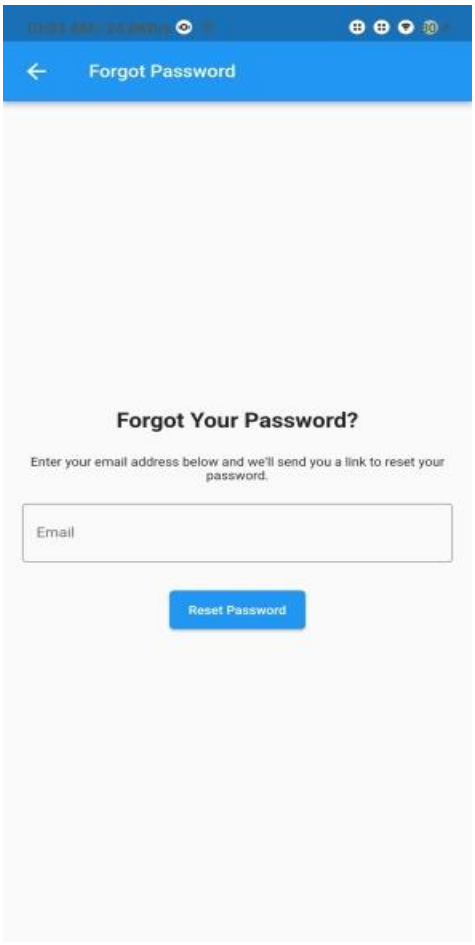


Figure 9: Forget Password

From this page if a user forgets their password they can reset their passwod

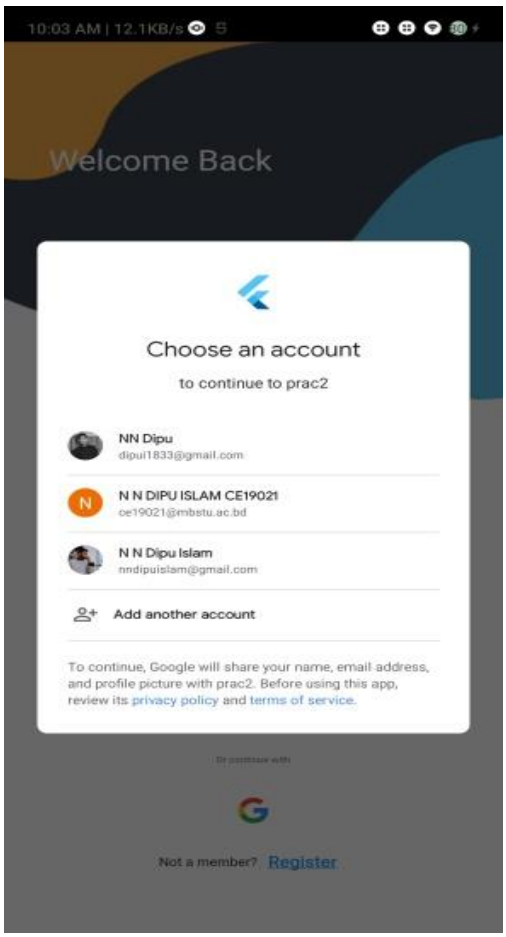


Figure 10:Third Party API Login

User can directly login using this third party login system.

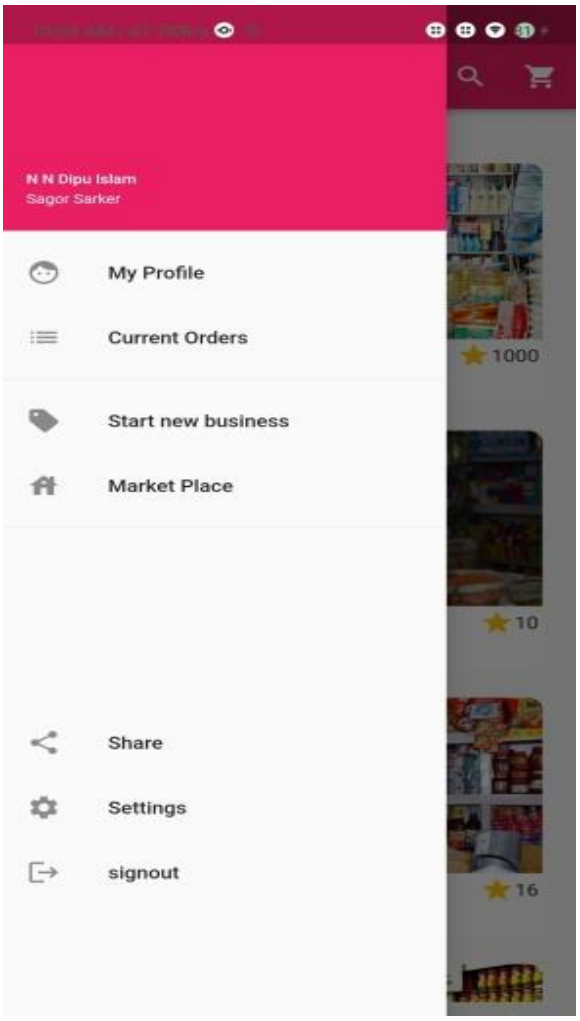


Figure 12: Home Page

Users can directly access the main functionalities from this homepage.

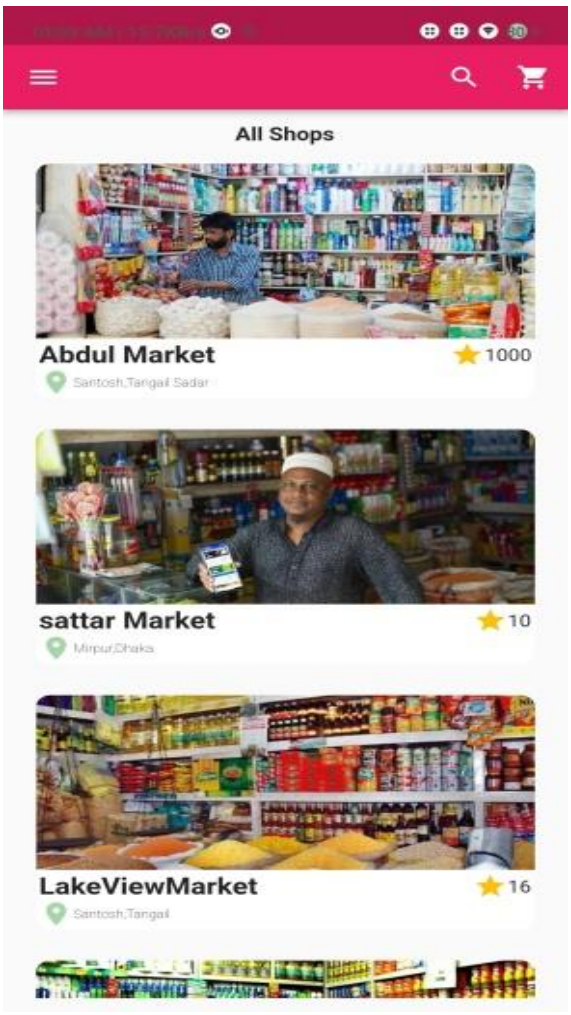


Figure 11:Location Based Shop

We can see the shops around us and the list of products along with prices.

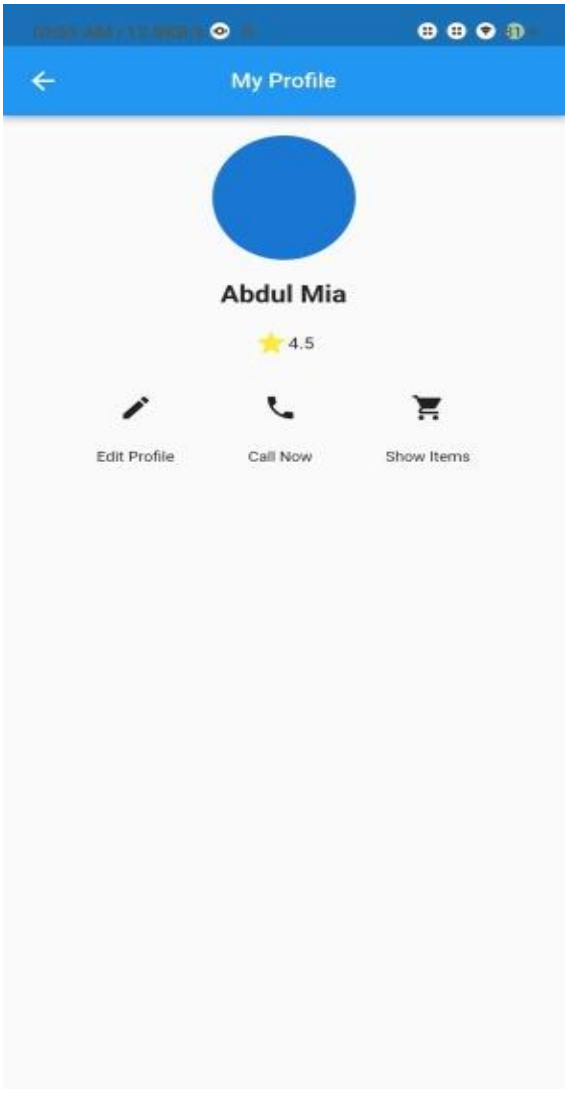


Figure 13:User Profile

You can see the shops details from this page and can also contact them.

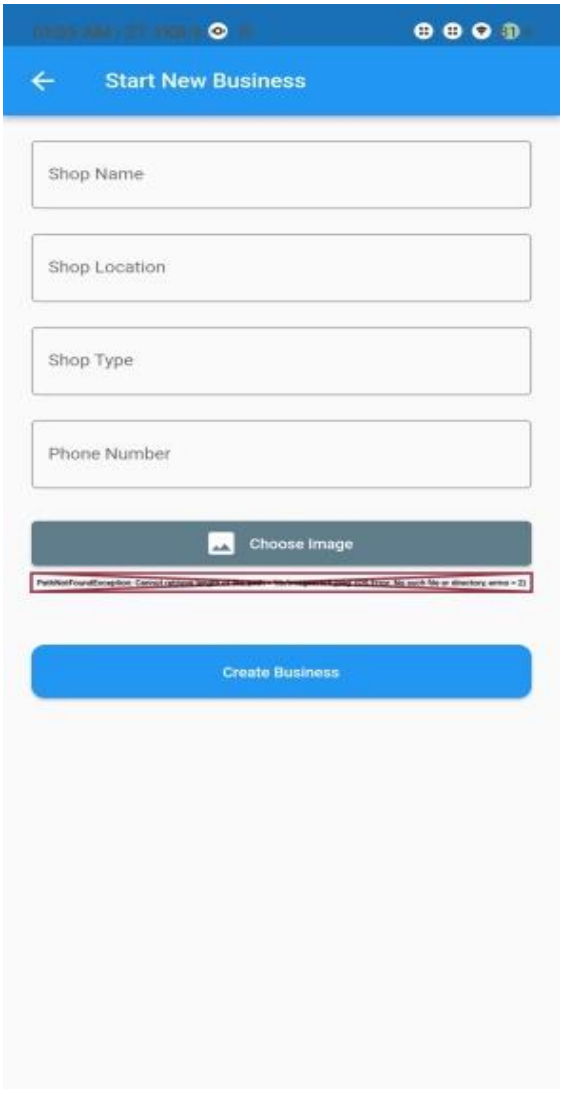


Figure 14: Create business page

From this page we can create our business account to start a new shop.

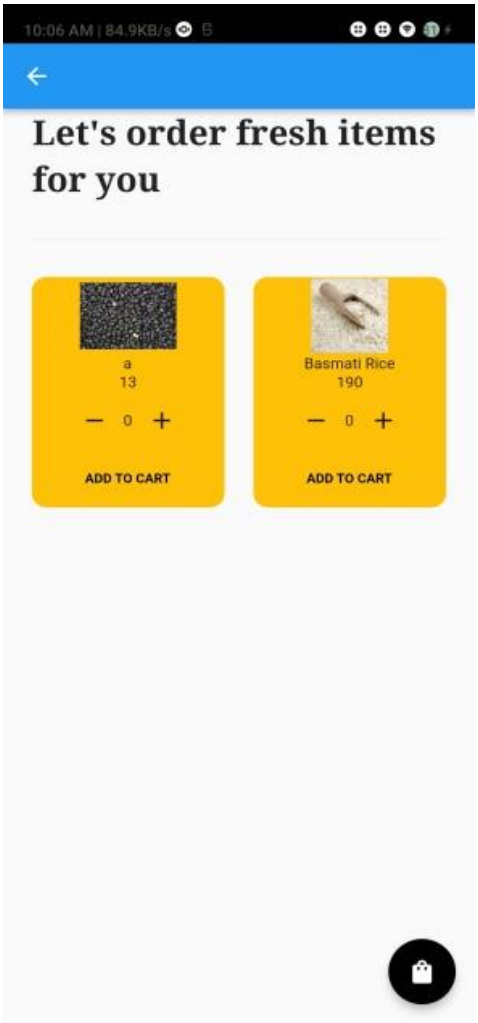


Figure 15: Item list

We can checkout the item lists of a shop with prices and we can add them in the cart.

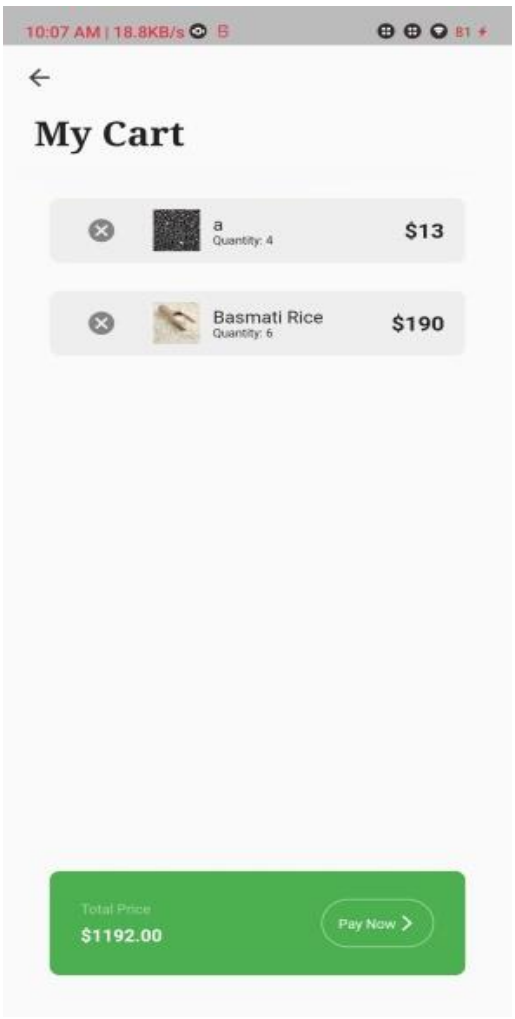


Figure 16 : Cart page

In the cart page, we can see the products that we like or we want to buy.

Figure 17 : Marketplace

This is the open marketplace where anyone can sell their items here. He just need to have a business account and upload the product advertisement.

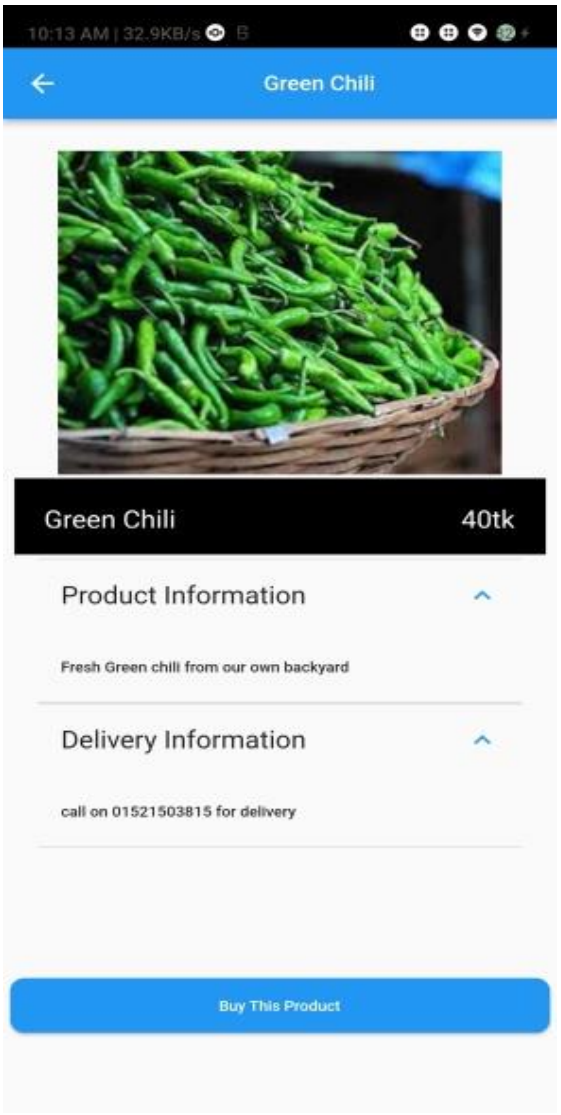


Figure 18: Product Information

The Buyer can check the item details from here.

Chapter 7

Limitations, Future Work and Conclusion

7.1 Limitations

- Not optimized for too many users.
- Do not have our own delivery system.
- No payment system.
- No delivary system

7.2 Future Work

- We will optimize it.
- We will try to scale up the user.
- We will try to deploy it in the live server
- We will try to convince users by seminers to use our app.

7.3 Conclusion

The goal of this project is to make the current market farmer centric. We want to design a system where the farmers will get a fair price and the young generations will get motivated for farming. This project also enhance the current shopping system by introducing location based market and ordering items from home. We hope this project will help every level of people from root to the city.

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