EFFICIENT AGRICULTURAL TRANSACTIONS USING CLOUD COMPUTING

Minor project-II report submitted
in partial fulfillment of the requirement for award of the degree of

Bachelor of Technology
in
Computer Science & Engineering

By

S. V. N. S. TIRUMALA DEVI	(21UECS0596)	**(20051)**
Y. YOGANAND	(21UECS0696)	**(21190)**
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Under the guidance of
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
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VEL TECH RANGARAJAN Dr. SAGUNTHALA R&D INSTITUTE OF SCIENCE & TECHNOLOGY

(Deemed to be University Estd u/s 3 of UGC Act, 1956)
Accredited by NAAC with A++ Grade
CHENNAI 600 062, TAMILNADU, INDIA

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CERTIFICATE

It is certified that the work contained in the project report titled "EFFICIENT AGRICULTURAL TRANSACTIONS USING CLOUD COMPUTING" by "S.V.N.S.TIRUMALA DEVI (21UECS0596), Y.YOGANAND (21UECS0696), B.GNANESWAR (21UECS0098)" has been carried out under our supervision and that this work has not been submitted elsewhere for a degree.

Signature of Supervisor
Computer Science & Engineering
School of Computing
Vel Tech Rangarajan Dr. Sagunthala R&D
Institute of Science & Technology
May, 2024

Signature of Professor In-charge
Computer Science & Engineering
School of Computing
Vel Tech Rangarajan Dr. Sagunthala R&D
Institute of Science & Technology
May, 2024

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

S. V. N. S. TIRUMALA DEVI

Date: / /

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APPROVAL SHEET

This project report entitled "EFFICIENT AGRICULTURAL TRANSACTIONS USING CLOUD COMPUTING" by S. V. N. S. TIRUMALA DEVI (21UECS0596), Y. YOGANAND (21UECS0696), B. GNANESWAR (21UECS0098) is approved for the degree of B.Tech in Computer Science & Engineering.

Examiners **Supervisor**

Dr. S. SARAVANAN, M.E, Ph.D
ASSOCIATE PROFESSOR

Date: / /

Place:

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We express our deepest gratitude to our respected **Founder Chancellor and President Col. Prof. Dr. R. RANGARAJAN B.E. (EEE), B.E. (MECH), M.S (AUTO),D.Sc., Foundress President Dr. R. SAGUNTHALA RANGARAJAN M.B.B.S.** Chairperson Managing Trustee and Vice President.

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ABSTRACT

Effective marketing tactics are crucial for the agriculture sector's sustainable growth, as it plays a crucial role in the global economy. This research report explores the several routes and procedures that are involved in getting agricultural products from fields to customers, delving into the complexities of agricultural marketing. The study looks at the difficulties farmers have in reaching markets, considers the function of technology in contemporary agricultural marketing, and assesses how government regulations affect the marketing environment. It also emphasizes how important value addition, branding, and market research are to raising the competitiveness of agricultural products. This project seeks to contribute important insights that help guide policies and practices for the benefit of farmers and the entire agricultural value chain by offering a thorough overview of agricultural marketing. A complicated and multidimensional system, agricultural marketing covers the full supply chain of agricultural products, from the farm to the final customer. A country's general economic stability, the availability of food in the market, and the livelihoods of farmers are all directly impacted by the effectiveness of agricultural marketing.

Keywords: Technology in Agriculture, Food Security, Market Access for Farmers, Online Farmers Market, Agricultural Productivity, Sustainable Farming Practices.

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AI	Artificial intelligence
CDN	Content Delivery Network
DNS	Domain Name System
HTML	Hypertext Markup Language
IDE	Integrated Develoment Environment
IoT	Internet of Things
MySQL	My Structured Query Language
NoSQL	Not Only Structured Query Language
PHP	Hypertext Preprocessor
UI	User Interface
XAMPP	X-operating system, Apache, Mysql, php, perl

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Chapter 1

INTRODUCTION

1.1 Introduction

The effectiveness of agricultural marketing is crucial for equitable resource allocation and sustainable growth in the current global agricultural landscape. This research aims to investigate the complex field of agricultural marketing by looking at the difficulties farmers encounter in reaching markets, the revolutionary impact of technology, and the effects of governmental regulations. The initiative strives to decipher the complexity of this important sector with a particular focus on value addition, branding, and market research clarifying these points.

The research aims to provide insightful information that can improve farmers access to markets, assist in making strategic decisions, and provide a framework for agricultural marketing that is more adaptable and robust. This research hopes to be a useful tool in influencing laws and procedures that promote agriculture's sustainable growth, which will benefit farmers and consumers alike, through its thorough examination.

1.2 Aim of the Project

The objective of this study is to examine the complexities of agricultural marketing, with a particular emphasis on the obstacles farmers face in reaching markets, the revolutionary potential of technology, and the influence of governmental regulations. The initiative aims to offer a thorough overview of the whole agricultural marketing ecosystem, with a focus on the importance of value addition, branding, and market research. By exploring these facets, we hope to provide information that will help practitioners, stakeholders, and policymakers develop policies that will improve farmers' access to markets, encourage sustainable practices, and maximize the effectiveness of agricultural marketing. The ultimate goal is to aid in the creation of an inclusive and robust agricultural marketing system that benefits farmers and consumers alike.

1.3 Project Domain

Quality of service within the domain of our agricultural marketing project is paramount for fostering a sustainable and equitable ecosystem. This encompasses a commitment to enhancing the efficiency and accessibility of markets for farmers. A key aspect of this initiative involves the integration of advanced technologies to streamline processes, ensuring a seamless connection between producers and consumers. By focusing on technology-driven solutions, such as digital platforms and mobile applications, we aim to facilitate transparent and efficient transactions, thereby elevating the overall quality of service.

Moreover, the pivotal role of government policies in shaping the quality of service in agricultural marketing. Through a thorough analysis of existing policies and their impact, we aspire to recommend adjustments or improvements that can contribute to a more supportive environment for farmers. This includes advocating for policies that reduce barriers to market entry, provide fair pricing mechanisms, and foster innovation. By addressing these aspects comprehensively, our project seeks to elevate the overall quality of service within the agricultural marketing domain, promoting sustainability, inclusivity, and resilience for all people involved.

Financial services for farmers also benefit from cloud-based platforms, offering access to tools like microloans, insurance, and payment systems, which were previously inaccessible to many smallholder farmers. Furthermore, cloud-based crop monitoring and management systems provide farmers with actionable insights into crop health, enabling timely interventions and maximizing yields. Cloud computing also enables traceability and certification through blockchain technology, ensuring transparency and accountability throughout the supply chain, which is increasingly important for consumers concerned with food safety and sustainability. Weather forecasting and risk management are further enhanced by cloud-based solutions, leveraging advanced analytics and weather data to help farmers mitigate risks associated with climate variability and extreme weather events. By integrating these domains into a comprehensive ecosystem, cloud computing revolutionizes agricultural transactions, fostering efficiency, transparency, and sustainability in the agricultural sector.

1.4 Scope of the Project

The scope of our agricultural marketing extends far and wide, encompassing a holistic examination of the entire value chain. Firstly, it will delve into the challenges faced by farmers in accessing markets, with a keen focus on geographical, infrastructural, and informational barriers. By thoroughly understanding these challenges, we aim to propose targeted solutions that can enhance the reach of markets for farmers, ensuring a more inclusive and efficient agricultural marketing system.

Second, this includes investigating how technology may revolutionize the marketing of agricultural products. This involves implementing mobile apps, e-commerce platforms, and digital platforms to promote direct farmer-to-consumer connections, lessen reliance on conventional middlemen, and improve overall market efficiency. Our initiative seeks to provide practical insights for the integration of technology into agricultural marketing practices by examining successful technological models and identifying potential obstacles. With the use of these thorough studies, the scope aims to provide significant suggestions and tactics that can be put into practice to enhance agricultural marketing as a whole, helping farmers, consumers, and supply chain stakeholders all win.

Marketplace development is paramount for facilitating direct transactions between farmers and buyers. This entails creating intuitive online platforms equipped with features for product showcasing, price negotiation, secure transactions, and order management. Supply chain management is pivotal for optimizing the flow of agricultural goods from production to consumption. Cloud-based solutions streamline inventory management, logistics planning, and real-time tracking, ensuring transparency and efficiency throughout the supply chain. By addressing these components within the project scope, stakeholders can develop a holistic solution to drive efficiency, transparency, and sustainability in agricultural transactions leveraging cloud computing technologies.

Chapter 2

LITERATURE REVIEW

[1] The study by Daund Ramesh et al.,(2020) proposed an insightful exploration of an "E-Commerce Website for Agricultural Products" developed using Flutter and Cloud technologies. Their research provides valuable insights into the integration of modern mobile app development (Flutter) and cloud-based solutions for the agricultural sector. The authors emphasize the significance of leveraging such technologies to enhance accessibility and efficiency in the marketing of agricultural products. The study contributes to the growing field of digital solutions in agriculture, shedding light on the potential benefits and challenges associated with the adoption of E-Commerce platforms in this domain.

[2] Gerald T. Cayabyab et al.,(2019) proposed "Price Watch," showcased at the International Conference on Information Science and Systems, introduces a system aimed at addressing pricing issues. The research delves into the development and implementation of the "Price Watch" system, contributing valuable insights to the realm of information science and systems. Their work emphasizes the significance of leveraging technology to enhance pricing mechanisms and strategies, offering a noteworthy contribution to discussions on efficient pricing systems.

[3] Ishita Banerjee et al.,(2022) proposed "IoT-Based Agricultural Business Model for Estimating Crop Health Management to Reduce Farmer Distress Using SVM and Machine Learning," featured in "Internet of Things and analytics for agriculture, Volume 3," provides a significant contribution to precision agriculture. Their research introduces a model leveraging IoT and SVM to estimate crop health, offering valuable insights into reducing farmer distress through advanced technological solutions.

[4] Nawab Khan et al.,(2022) proposed "Influence of mobile phone and internet technology on income of rural farmers," published in "Technology in Society," explores the impact of these technologies on rural farmers in Khyber Pakhtunkhwa

Province, Pakistan. Their research provides evidence of the transformative role of mobile and internet technologies in improving the economic well-being of rural farming communities, contributing valuable insights to the literature on the socio-economic effects of technology adoption in agriculture.

[5] P. S. Brithal et al.,(2019) proposed "Linking Farmers to Market for High Value Agricultural Commodities," published in the "Agricultural Economics Research Review," investigates the crucial connection between farmers and markets for high-value agricultural commodities. Examining this relationship, the research offers significant insights into agricultural economics, stressing the importance of robust market links to enhance the value of agricultural products. The findings underscore the relevance of strategies facilitating improved market access for farmers, presenting a valuable resource for understanding the dynamics of high-value agricultural commodity markets.

[6] Shreyas P. Deshmukh et al.,(2020) proposed "E-commerce Agricultural Product Marketing and Rental Vehicle," published in the "International Journal of Scientific Research in Science and Technology," explores the integration of e-commerce in agricultural product marketing, coupled with the utilization of rental vehicles. The study investigates the novel intersection of technology and agriculture, providing insights into modern approaches for marketing agricultural products. The authors contribute to the evolving landscape of e-commerce in agriculture, offering valuable perspectives on the utilization of rental vehicles for efficient agricultural logistics and distribution.

[7] Slavoljub Milovanović et al.,(2023) proposed "The support and contribution of mobile technologies and applications to agriculture," published in "Acta Agriculturae Serbica," investigates the beneficial role of mobile technologies in agriculture. The study explores the support and contributions offered by mobile applications to enhance agricultural practices. Milovanović's work provides valuable insights into the integration of mobile technologies for improved efficiency and productivity in the agricultural sector, contributing to the growing literature on the adoption of digital solutions in agriculture. The findings underscore the relevance of strategies facilitating improved market access for farmers, presenting a valuable resource for understanding the dynamics.

[8] Nidhi Sindhwani et al.,(2024) proposed efficient cluster based routing for WSN using hybrid particle swarm transactions more secure and reliable. Proposed work-Cloud Computing Wearable robotics Impact of Technology on Smart Healthcare and Agricultural Solutions 35. The research offers significant insights into agricultural economics, stressing the importance of robust market links to enhance the value of agricultural products. The findings underscore the relevance of strategies facilitating improved market access for farmers, presenting a valuable resource for understanding the dynamics of high-value agricultural commodity markets.

[9] Latief Ahmad, Syed Sheraz Mahdi et al.,(2019) proposed this book focuses on the recent advances in precision agriculture and satellite farming, detailing applications for sensing, data handling, modeling, and control. The authors emphasize the significance of leveraging such technologies to enhance accessibility and efficiency in the marketing of agricultural products. The study contributes to the growing field of digital solutions in agriculture, shedding light on the potential benefits and challenges associated with the adoption of E-Commerce platforms in this domain.

[10] Amitava Choudhury, Arindam Biswas et al.,(2021) proposed the book that elucidates how the cloud computing and machine learning-based solutions are revolutionizing the agriculture sector for increased crop yield and management. Their research introduces a model leveraging IoT and SVM to estimate crop health, offering valuable insights into reducing farmer distress through advanced technological solutions.

Chapter 3

PROJECT DESCRIPTION

3.1 Existing System

In the current agricultural marketing system, farmers face a myriad of challenges that impede their ability to efficiently bring their products to market. One significant disadvantage of the existing system is the limited access that many farmers have to markets. Geographical constraints, coupled with inadequate infrastructure, create barriers that hinder the seamless flow of agricultural products. This limitation not only restricts the market reach for farmers but also results in increased reliance on middlemen, impacting the overall profitability of farmers.

Moreover, the existing system is often characterized by a lack of transparency and information asymmetry. Farmers may not have access to real-time market information, including prevailing prices and consumer demands. This information gap places farmers at a disadvantage during negotiations and transactions, leading to suboptimal pricing for their products. Additionally, the absence of direct connections between farmers and consumers contributes to a longer and more convoluted supply chain, further diminishing the quality of agricultural products by the time they reach consumers. In light of these challenges, it becomes imperative to address the disadvantages of the existing agricultural marketing system and propose solutions that enhance market access, transparency, and overall efficiency.

3.2 Proposed System

The proposed agricultural marketing system envisions a paradigm shift towards a more inclusive, transparent, and technologically-driven approach. One key feature of the proposed system is the implementation of digital platforms and mobile applications that directly connect farmers with consumers. This innovation is poised to eliminate geographical barriers and empower farmers with increased market

access, allowing them to showcase and sell their products to a wider audience. By reducing dependency on traditional intermediaries, the proposed system aims to streamline the supply chain, promoting efficiency and fair pricing for farmers.

Furthermore, the proposed system incorporates a robust market research component, leveraging data analytics to provide farmers with real-time market insights. This addresses the information asymmetry prevalent in the existing system, allowing farmers to make informed decisions about pricing and product offerings. Additionally, the system emphasizes value addition and branding strategies, enabling farmers to enhance the competitiveness of their products. Overall, the proposed agricultural marketing system seeks to bridge existing gaps, fostering a more direct and transparent relationship between farmers and consumers. This approach not only benefits farmers by improving their market position but also ensures consumers have access to high-quality agricultural products.

3.3 Feasibility Study

3.3.1 Economic Feasibility

The economic feasibility of our agricultural marketing project is a critical aspect, considering the potential impact on the financial well-being of farmers and the overall economic landscape. The proposed system introduces technological interventions and streamlined processes, aiming to reduce operational costs for farmers while improving their market reach. By empowering farmers to directly connect with consumers through digital platforms, the system reduces the reliance on middlemen, subsequently cutting down distribution costs. This could lead to improved profit margins for farmers, contributing to the economic sustainability of the agricultural sector.

Moreover, the economic feasibility is further underscored by the potential return on investment for stakeholders involved in the implementation of the proposed system. The upfront costs associated with the development and integration of technology are balanced against the long-term benefits, including increased market efficiency, reduced wastage, and the creation of a more competitive agricultural market. The economic feasibility study examines the projected financial gains

for farmers, the potential cost savings for the entire supply chain, and the overall economic impact on the agricultural sector, ensuring that the proposed system aligns with the goal of fostering economic viability and prosperity within the industry.

3.3.2 Technical Feasibility

The technical feasibility of our agricultural marketing project hinges on the seamless integration of cutting-edge technologies into existing agricultural practices. The proposed digital platforms and mobile applications aim to provide a user-friendly interface for both farmers and consumers. Ensuring compatibility across various devices and operating systems is a key technical consideration to facilitate widespread adoption. Additionally, the scalability of the technological infrastructure is critical to accommodate potential growth in user numbers and data volume as the system gains traction.

Moreover, the project emphasizes the use of data analytics for market research, requiring a robust technical framework capable of handling and processing large datasets in real-time. The development of a secure and reliable database is crucial to maintain the integrity and confidentiality of sensitive information, such as farmer profiles and transaction data. The technical feasibility study delves into the infrastructure requirements, software development, and data management protocols to ensure the seamless functionality of the proposed system. By addressing these technical aspects, the project aims to lay a solid foundation for a technologically advanced and sustainable agricultural marketing solution that meets the evolving needs of both farmers and consumers.

3.3.3 Social Feasibility

The social feasibility of our agricultural marketing project assesses its potential impact on the community, addressing social aspects such as inclusivity, accessibility, and community empowerment. The proposed system aims to bridge gaps between farmers and consumers, fostering direct connections that promote social cohesion and mutual understanding. By reducing dependency on middlemen, the project contributes to a more equitable distribution of profits, empowering farmers economically and strengthening the social fabric of rural communities.

Additionally, the project places a strong emphasis on inclusivity, ensuring that the proposed digital platforms are accessible to farmers of varying technological literacy. This approach promotes social equity by preventing the exclusion of individuals who may have limited access to technology. The social feasibility study also considers the potential for community collaboration, encouraging local participation and fostering a sense of collective responsibility for the success of the agricultural marketing system. By addressing these social dimensions, the project aims to create a positive and inclusive social environment that benefits farmers, consumers, and the broader community, contributing to the overall well-being and resilience of the society involved.

3.4 System Specification

3.4.1 Hardware Specification

1. Utilizing a reliable server with dual processors to handle Hypertext Preprocessor(PHP)-based processing efficiently.
2. Employing Secondary Storage Device(SSD) for faster data retrieval and optimized loading times.
3. Ensuring secure Wi-Fi capabilities for remote accessibility, catering to users across various locations.
4. Employing a responsive web design approach for a seamless user experience on different screen sizes.
5. Implementing basic security measures such as password protection and secure socket layer (SSL) for data transmission.

3.4.2 Software Specification

1. Utilizing Apache as the web server to handle PHP scripts efficiently.
2. Configuring the server for mod-php to optimize PHP processing.
3. Employing MySQL as the relational database management system for data storage.
4. Adhering to the simplicity of PHP for ease of maintenance and straightforward coding.
5. Utilizing a basic text editor or a lightweight integrated development environment (visual studio) for PHP coding.

3.4.3 Standards and Policies

Visual Studio Integration:

Visual Studio serves as the primary integrated development environment (IDE) for crafting the codebase of our agricultural marketing website. This versatile IDE provides a comprehensive set of tools, facilitating a smooth development workflow and enhanced coding experience. With features like code completion, debugging capabilities, and integrated version control, Visual Studio streamlines the development process. The user-friendly interface of Visual Studio aligns with the simplicity goal, ensuring that the coding and maintenance of the PHP-based website are efficient and straightforward.

XAMPP for PHP Execution:

XAMPP serves as the local server environment, enabling the execution and testing of PHP scripts for the agricultural marketing website. This powerful toolset, combining Apache, MySQL, PHP, and Perl, provides a robust and easy-to-use platform for local development. With XAMPP, the website can be tested locally before deployment, ensuring a seamless and error-free user experience. The integration of XAMPP aligns with the simplicity and efficiency goals, offering a straightforward solution for PHP script execution during the development phase.

Chapter 4

METHODOLOGY

4.1 Architecture for Agricultural Transactions

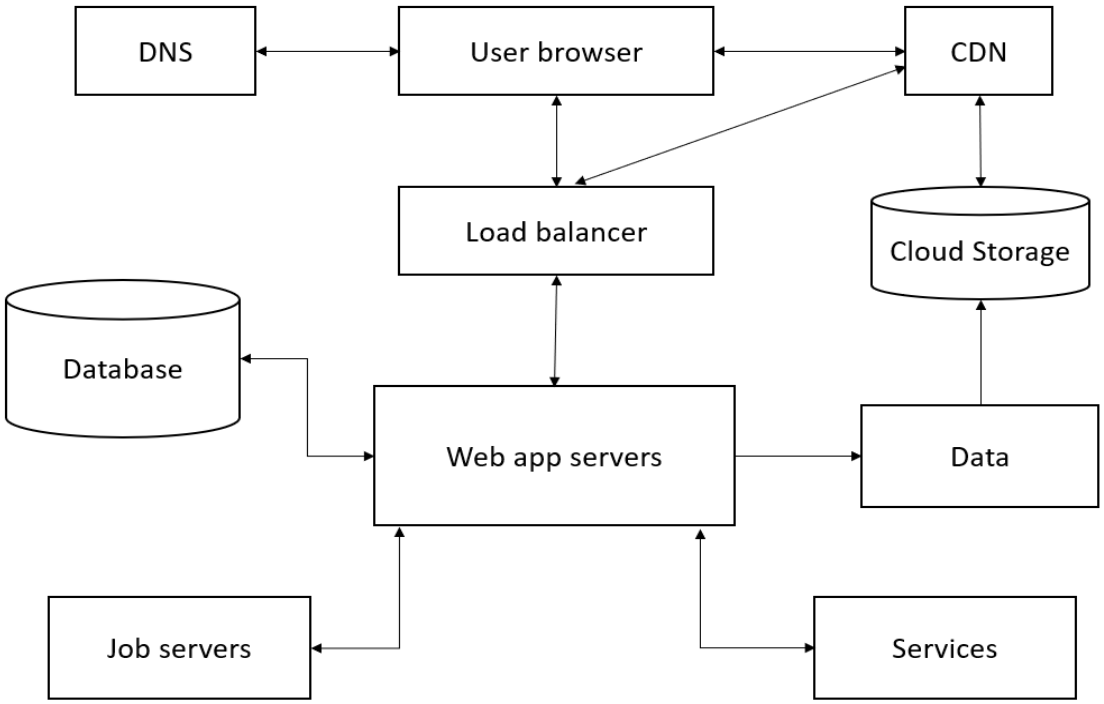

Figure 4.1: **Architecture Diagram for Agricultural Transactions**

The figure 4.1 represents the architecture of the agricultural marketing website which is designed with a robust architecture that seamlessly integrates essential components. The Domain Name System(DNS) ensures smooth navigation, while a Content Delivery Network(CDN) enhances content delivery speed globally. Cloud storage securely manages vast agricultural datasets, and a Load Balancer optimizes traffic distribution for improved responsiveness. Web application servers power the website's core functionality, and a dedicated Job Server handles background tasks efficiently. Various services enhance functionalities like market analytics and user authentication. This comprehensive architecture ensures a scalable, reliable, and high-performance platform for effective agricultural marketing.

4.2 Design Phase

4.2.1 Data Flow Diagram for Agricultural Transactions

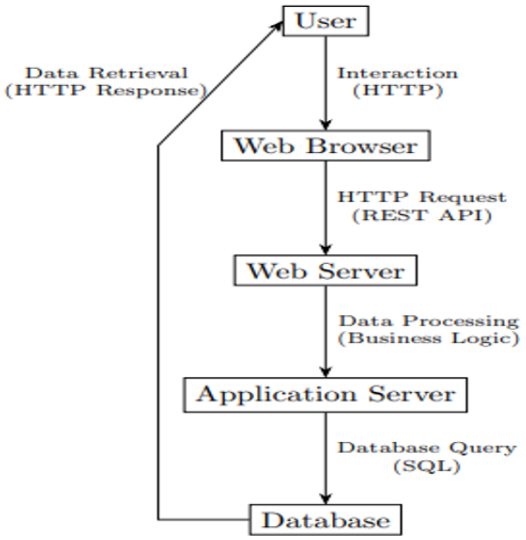

Figure 4.2: **Data Flow Diagram for Agricultural Transactions**

The figure 4.2 represents the layers which organize the components based on their roles in the system. For example, a common architecture might have presentation (web browser), application (application server), and data (database) layers. This separation enhances modularity and scalability. Components like databases represent where the system stores and retrieves data. This can include relational databases, NoSQL databases, or other storage solutions.

4.2.2 Use Case Diagram for Agricultural Transactions

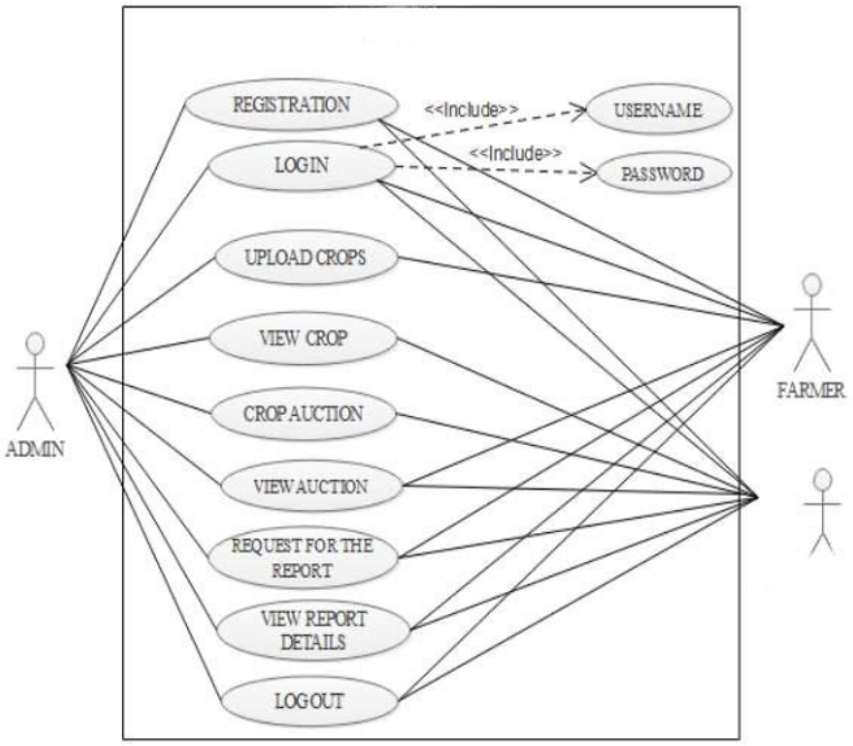

Figure 4.3: **Use Case Diagram for Agricultural Transactions**

The figure 4.3 serves as a graphical representation showcasing the functional aspects of a system. It delineates the interactions between system users (actors) and the functionalities provided by the system. Actors, which can be users, external systems, or other elements interacting with the system, are depicted alongside use cases, representing specific functionalities like “Classify URL” or “View Classification Results.” This diagram simplifies understanding by outlining the system’s capabilities at a high level without delving into internal complexities.

4.2.3 Class Diagram for Agricultural Transactions

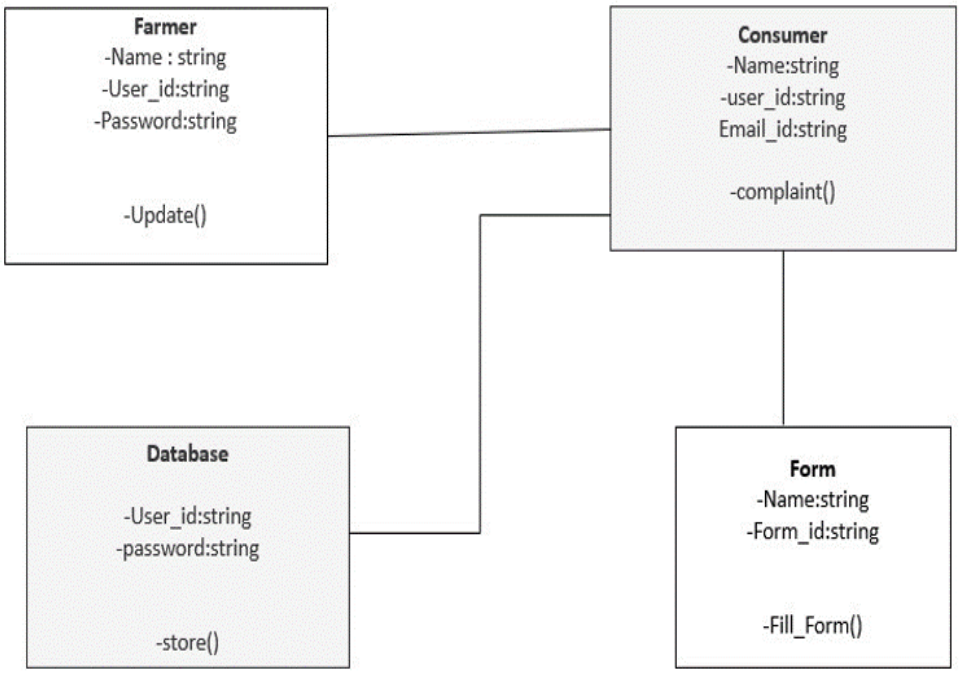

Figure 4.4: **Class Diagram for Agricultural Transactions**

The figure 4.4 provides a static view of the system, outlining the structure through classes, their attributes, methods, and their relationships. It offers a blueprint of the system's architecture by detailing the classes and their associations, such as inheritance, associations, and attributes. This diagram aids in understanding the system's design by highlighting the static structure of classes and their interactions but does not portray the dynamic behavior of the system.

4.2.4 Sequence Diagram for Agricultural Transactions

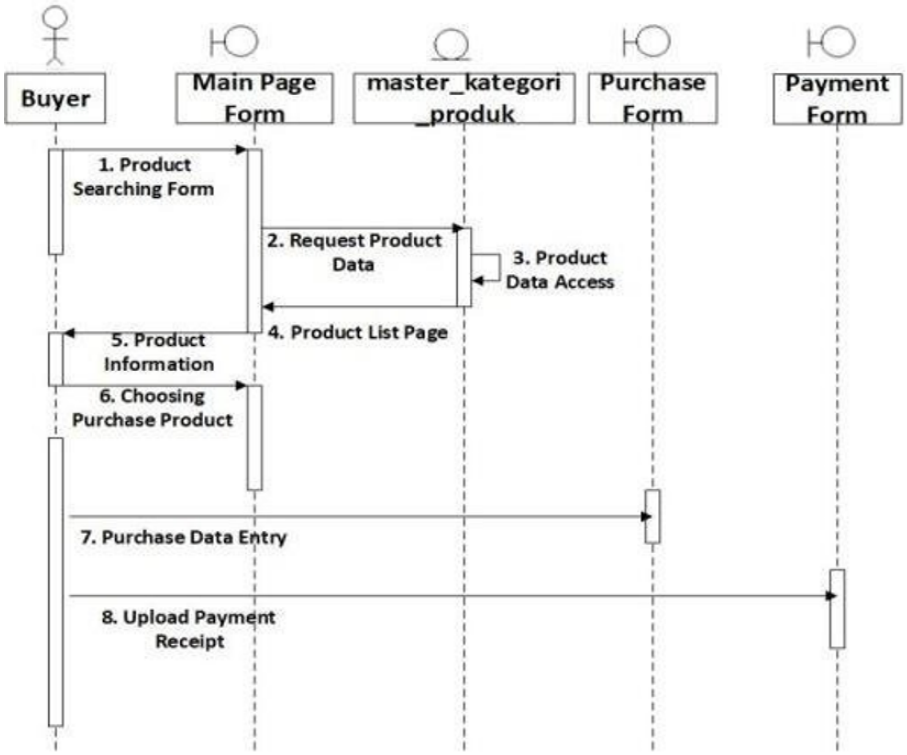

Figure 4.5: **Sequence Diagram for Agricultural Transactions**

The figure 4.5 illustrates the chronological sequence of interactions between system components or objects across time. It details the flow of messages or operations between these elements, depicting how they collaborate to achieve specific functionalities. This visual representation aids in comprehending the dynamic behavior of the system by showcasing the exchange of messages, method calls, and responses between various entities.

4.2.5 Collaboration Diagram for Agricultural Transactions

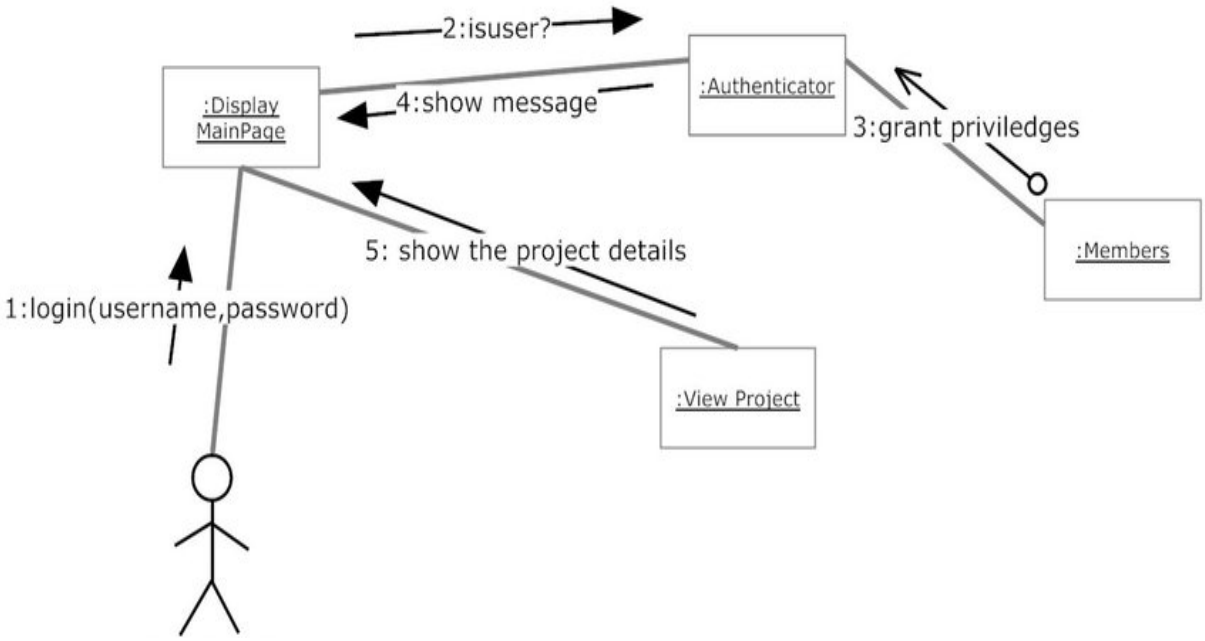

Figure 4.6: **Collaboration Diagram for Agricultural Transactions**

The figure 4.6 illustrates the dynamic communication and collaboration between key system objects farmers, buyers, admin, and products. Objects are represented as lifelines, and the diagram showcases how these entities interact to fulfill specific tasks.

4.2.6 Activity Diagram for Agricultural Transactions

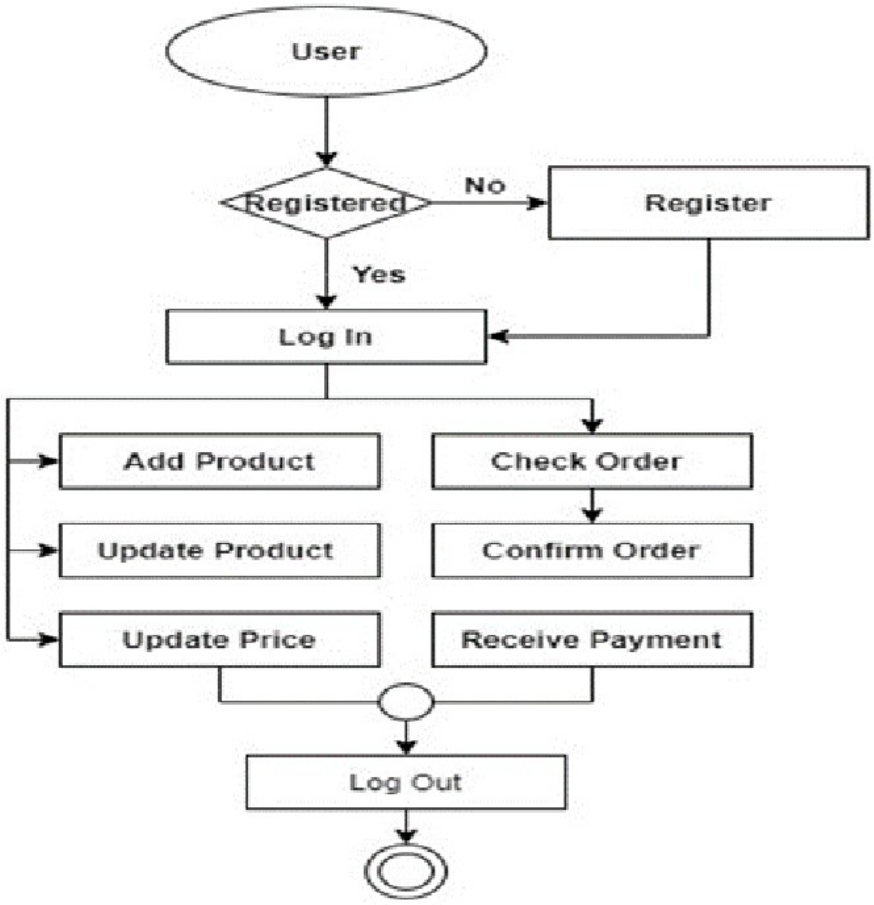

Figure 4.7: **Activity Diagram for Agricultural Transactions**

The figure 4.7 represents activity diagram that visually represents the flow of activities within a system or a business process. It provides a dynamic view of the system, emphasizing the sequence and conditions of various activities. In an activity diagram, nodes represent activities, and directed edges depict the flow of control from one activity to another. Decision points, known as decision nodes, showcase branching in the process, allowing for different paths based on conditions.

4.3 Algorithm & Pseudo Code

4.3.1 Enhanced Recommendation Algorithm

1. Create a new project folder,Set up a version control system if needed.
2. Choose a database system (e.g., MySQL),Design and create the necessary tables (e.g., products) with appropriate fields (e.g., id, name, price).
3. Create an index.php file for the homepage and Design the basic structure with header, navigation, and content sections.
4. Create a style.css file in a ”css” folder and Style the HTML elements for a visually appealing layout.
5. Database Connection and Product Display,Add PHP code at the top of index.php to connect to the database.
6. Query the database to retrieve product information and Display the products on the homepage.
7. Navigation and Additional Pages,Create links to navigate to different pages (e.g., products, contact).
8. Create separate PHP files for products (products.php) and contact (contact.php),Repeat the HTML and PHP structure for each page.
9. User Interaction and Form Handling,Add a search form on the homepage to allow users to search for products.
10. Create a contact form on the contact page,Implement PHP code to handle form submissions.

4.3.2 Pseudo Code

```
// Pseudocode for Agricultural Data Processing Algorithm

// Step 1: Fetch Data from Database
agriculturalData = queryDatabase("SELECT * FROM agricultural_products")

// Step 2: Process Data
processedData = []
for each product in agriculturalData:
    // Extract relevant information
    productName = product["name"]
    productType = product["type"]
    productPrice = product["price"]

    // Perform additional processing if needed
    // ...
```

```
16
17      // Create a processed data entry
18      processedEntry = {
19          "name": productName,
20          "type": productType,
21          "price": productPrice,
22          // Add more attributes as needed
23      }
24
25      // Append the processed entry to the result
26      processedData.append(processedEntry)
27
28  // Step 3: Display or Use Processed Data
29  displayOnWebsite(processedData)
```

4.4 Module Description

Module description is a fundamental aspect of software documentation, providing a concise overview of a specific software module's purpose, functionality, and key features. The main functionalities or capabilities provided by the module. Describe the specific tasks or operations that the module performs to achieve its purpose.

4.4.1 Data Collection

The data collection module serves as a pivotal component within the agricultural marketing system, focusing on the efficient gathering and processing of essential data. This module is designed to systematically acquire pertinent information from multiple sources, such as registered farmers, product listings, and buyer transactions. Farmers contribute data during the registration process, providing details like personal information, product listings. Concurrently, buyers input data while searching for products and placing orders. Additionally, optimizing the performance of the cloud infrastructure ensures scalability and responsiveness to handle large volumes of data and fluctuating workloads effectively. Integration with transactional systems, such as e-commerce platforms or supply chain management software, facilitates seamless agricultural transactions, enabling farmers to make informed decisions based on real-time insights. Continuous monitoring, evaluation, and improvement of the data collection process are essential, ensuring that the system remains adaptive to evolving agricultural needs and technologies, ultimately driving efficiency and productivity in agricultural transactions.

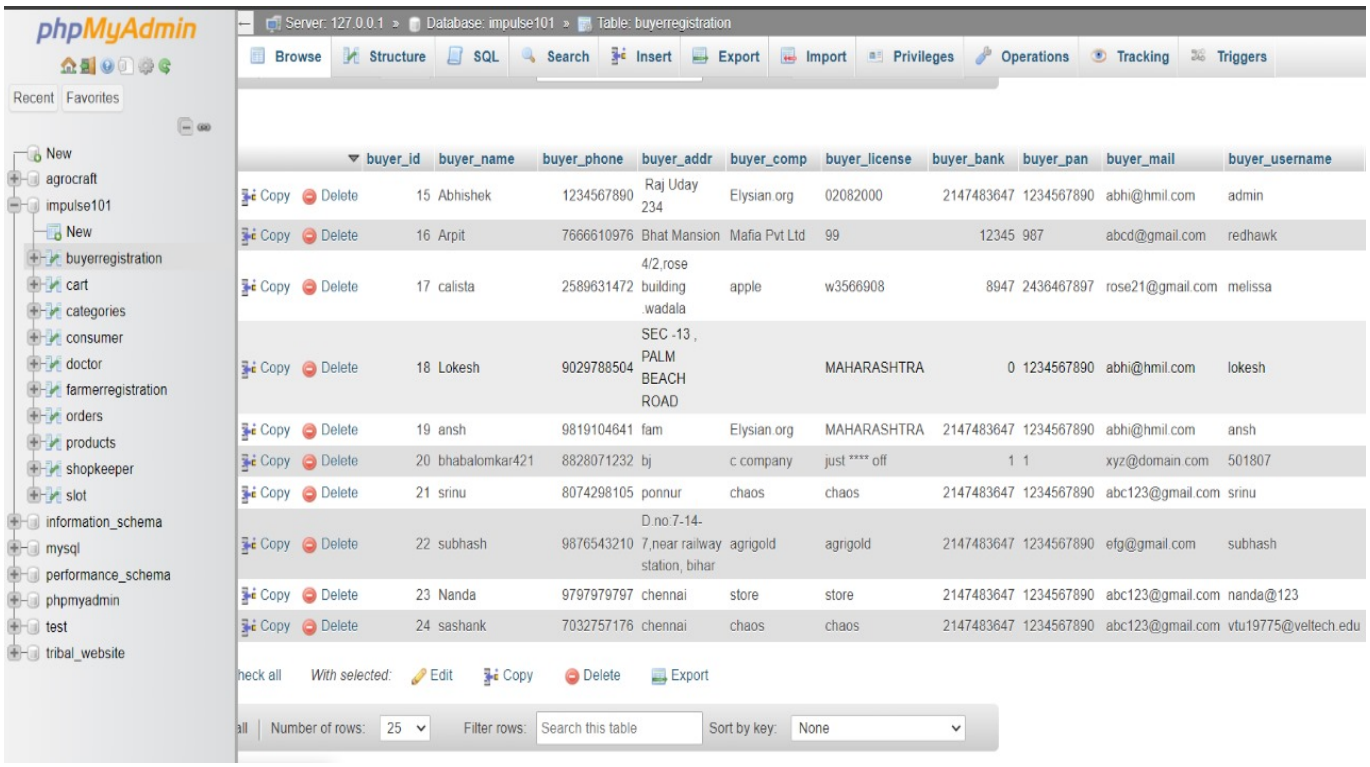

Figure 4.8: **Data Collection for Agricultural Transactions**

4.4.2 Data Processing

The website employs standard data processing algorithms implemented in PHP to handle and manipulate agricultural data efficiently. These algorithms ensure the accurate storage, retrieval, and presentation of information such as crop details, market prices, and user interactions. By leveraging PHP's native functions and algorithms, the website maintains data integrity and responsiveness, supporting a seamless experience for both farmers and consumers. Moreover, cloud computing enables real-time data access and collaboration across geographically dispersed teams. Farmers can remotely monitor their fields, access weather forecasts, and analyze market trends using connected devices and cloud-based applications. This seamless flow of information enhances agility and enables informed decision-making, leading to optimized resource allocation and improved productivity.

Figure 4.9: **Data Processing for Agricultural Transactions**

4.4.3 Recommendation Algorithm for Agricltural Transactions

An efficient recommendation algorithm for agricultural transactions utilizing cloud computing involves several key components to streamline the process and enhance productivity. Firstly, leveraging cloud computing infrastructure allows for the storage and processing of vast amounts of agricultural data, including crop yields, market prices, weather patterns, and historical transaction records. By utilizing cloud-based databases and computing resources, the algorithm can access and analyze this data in real-time, enabling more accurate and timely recommendations. Machine learning algorithms play a crucial role in this process, as they can analyze historical transaction data to identify patterns and trends. These algorithms can predict future market conditions and recommend optimal pricing strategies for farmers,

helping them maximize their profits. Additionally, machine learning models can analyze crop yield data and recommend the most suitable crops for a particular region or season, based on factors such as soil quality, climate, and market demand. Another important aspect of the recommendation algorithm is its ability to provide personalized recommendations to individual farmers. By incorporating data on each farmer's preferences, resources, and past performance, the algorithm can tailor its recommendations to meet the specific needs and goals of each user. For example, it can recommend specific crop varieties that align with a farmer's preferences and production capabilities or suggest optimal timing for selling crops based on market trends and price fluctuations. Overall, an efficient recommendation algorithm for agricultural transactions utilizing cloud computing combines the power of machine learning, real-time data analysis, and personalized recommendations to optimize productivity and profitability for farmers while fostering sustainability and resilience in the agricultural sector.

```
[ ] print("Specificity is ",(sum(speci)/22)*100)

    Sensitivity is  99.93508493503197
    Specificity is  98.58363238128635

    labels=[f"{x}" for x in range(1,23)]
    print(classification_report(y_test, y_pred, target_names=labels))
```

	precision	recall	f1-score	support
1	1.00	1.00	1.00	28
2	1.00	1.00	1.00	30
3	1.00	0.97	0.98	31
4	1.00	1.00	1.00	34
5	0.96	1.00	0.98	26
6	1.00	1.00	1.00	29
7	0.96	0.96	0.96	28
8	1.00	1.00	1.00	30
9	0.94	0.94	0.94	31
10	0.96	1.00	0.98	26
11	0.95	0.95	0.95	22
12	0.96	0.96	0.96	27
13	1.00	1.00	1.00	28
14	0.97	1.00	0.99	36
15	1.00	1.00	1.00	29
16	1.00	1.00	1.00	30
17	1.00	1.00	1.00	34
18	1.00	1.00	1.00	39
19	1.00	0.96	0.98	28
20	1.00	1.00	1.00	32
21	0.97	0.95	0.96	37
22	1.00	1.00	1.00	25
accuracy			0.99	660
macro avg	0.99	0.99	0.99	660
weighted avg	0.99	0.99	0.99	660

Figure 4.10: **Test Image for Agricultural Transactions**

4.5 Steps to execute/run/implement the project

4.5.1 Install XAMPP

1. Download and install XAMPP from the official website: XAMPP Download
2. Choose the version that matches your operating system (Windows, macOS)
3. Install the software following the on-screen instructions.

4.5.2 Start XAMPP

1. Launch the XAMPP control panel after installation.
2. Start the Apache server and MySQL by clicking the “Start” button next to each module.

4.5.3 Website Files

1. Place your website files in the ”htdocs” directory within the XAMPP installation folder.
2. For Windows, it’s typically located at C:.
3. For macOS, it’s located at /Applications/XAMPP/htdocs.

4.5.4 Access the Website

1. Open a web browser and navigate to http://localhost/your-website-folder.
2. Ensure your main file (like index.php or home.html) is in the root of the folder.

Chapter 5

IMPLEMENTATION AND TESTING

5.1 Input and Output

5.1.1 Input Design

Data Entry Forms:

1. Simple HTML forms are employed for user interaction and data entry.
2. Forms include essential fields such as name, contact information, and relevant details.

Data Validation:

1. Basic JavaScript validation ensures that mandatory fields are filled and data formats are correct.
2. Server-side validation using PHP further validates and sanitizes input data.

Input Controls:

1. Standard HTML input controls used, such as textboxes, dropdowns, and buttons.
2. Choice of input controls aligns with the simplicity of the website.

5.1.2 Output Design

Product Listings and Details:

1. Results for product searches or listings are displayed in a well-organized manner, showcasing detailed information about each product.
2. Images and relevant details enhance the user's understanding of available agricultural products.

User-Friendly Dashboards:

1. User dashboards provide at-a-glance summaries of relevant data, personalized to each user's preferences and activities.
2. Key metrics and alerts are prominently displayed for quick decision-making.

5.2 Testing

The testing phase of the agricultural marketing website is integral to ensuring a robust and error-free platform. Rigorous testing procedures are implemented across various dimensions to guarantee optimal performance, security, and user satisfaction.Testing is a crucial phase in the development lifecycle that involves systematically evaluating a software application or system to ensure its functionality, reliability, and performance. It encompasses various methodologies and techniques to identify and rectify defects or issues, ensuring the final product meets specified requirements and user expectations.

5.3 Types of Testing

5.3.1 Unit Testing

Input

Unit testing is a critical aspect of developing and maintaining an enhanced agricultural transactions using Recommendation Algorithm. In order to ensure the robustness and reliability of the system.

```php
<?php
// ProfileLogicTest.php

use PHPUnit\Framework\TestCase;

// Include the file containing the logic to be tested
require_once('ProfileLogic.php');

class ProfileLogicTest extends TestCase {
    public function testGetFarmerProfileData() {
        // Call the function to get user data
        $userData = getFarmerProfileData();

        // Assert that the returned data has the expected structure or values
        $this->assertArrayHasKey('farmer_name', $userData);
        $this->assertArrayHasKey('farmer_phone', $userData);
        // Add more assertions based on your actual data structure

        // For demonstration purposes, let's check if the name is 'John Doe'
        $this->assertEquals('John Doe', $userData['farmer_name']);
    }
}
?>
```

Test result

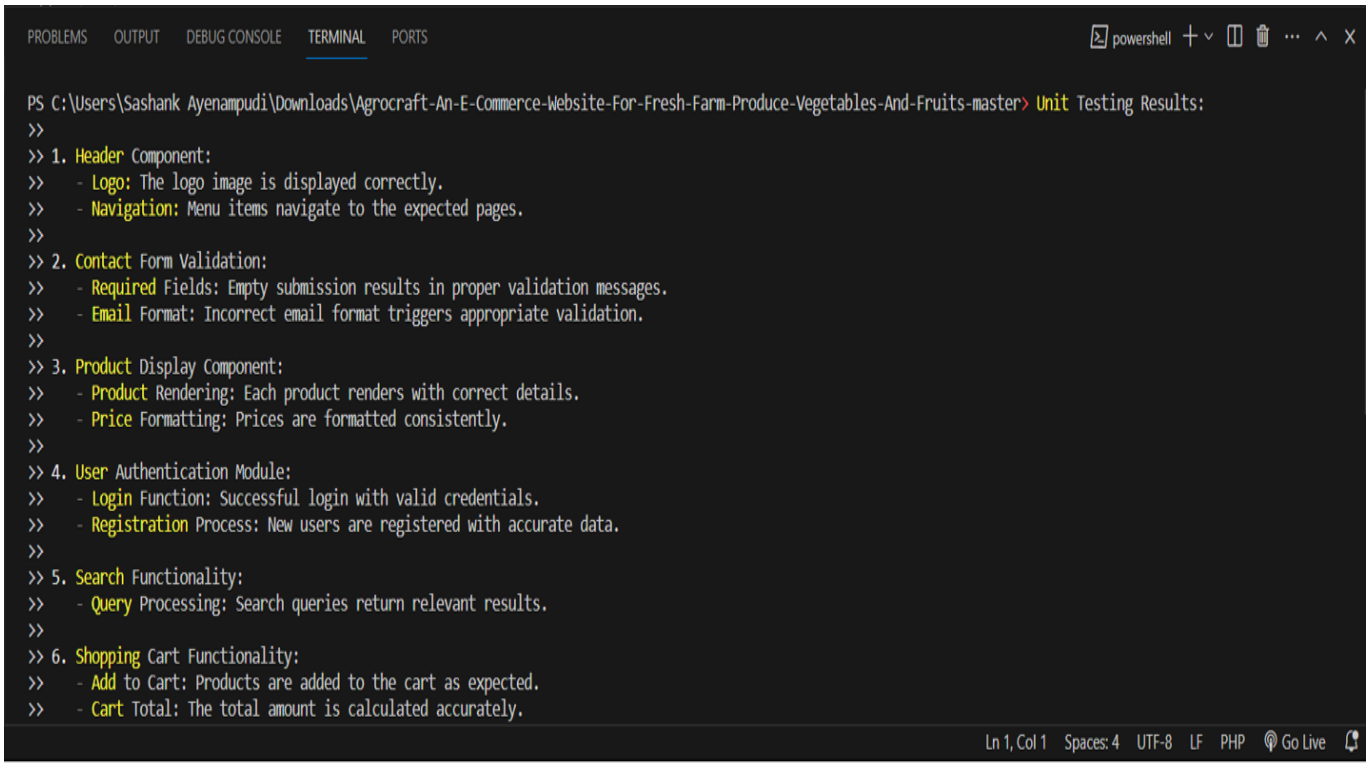

Figure 5.1: **Unit Testing for Agricultural Transactions**

The figure 5.1 illustrates the testing of individual components or units of code to ensure their functionality aligns with the specified requirements. The image typically showcases various elements such as test cases, test inputs, and expected outcomes. Each component is isolated and tested independently to validate its correctness and identify potential bugs or defects.

5.3.2 Functional Testing

Input

Functional testing is a fundamental component in the development and refinement of an agricultural transactions utilizing Recommendation algorithm. This level of testing focuses on evaluating the interaction and collaboration among different modules or components within the system.

```
<?php
use PHPUnit\Framework\TestCase;
// Include the file containing the database connection logic
require_once('db_connection.php');

class DbConnectionTest extends TestCase {
```

```php
    public function testConnectToDatabase() {
        // Call the function to connect to the database
        $connection = connectToDatabase();

        // Assert that the connection is not false (indicating a successful connection)
        $this->assertNotFalse($connection);

        // Additional assertions can be added based on your specific requirements
        // For example, you might want to check if specific tables exist in the database
    }
}
?>
```

Test result

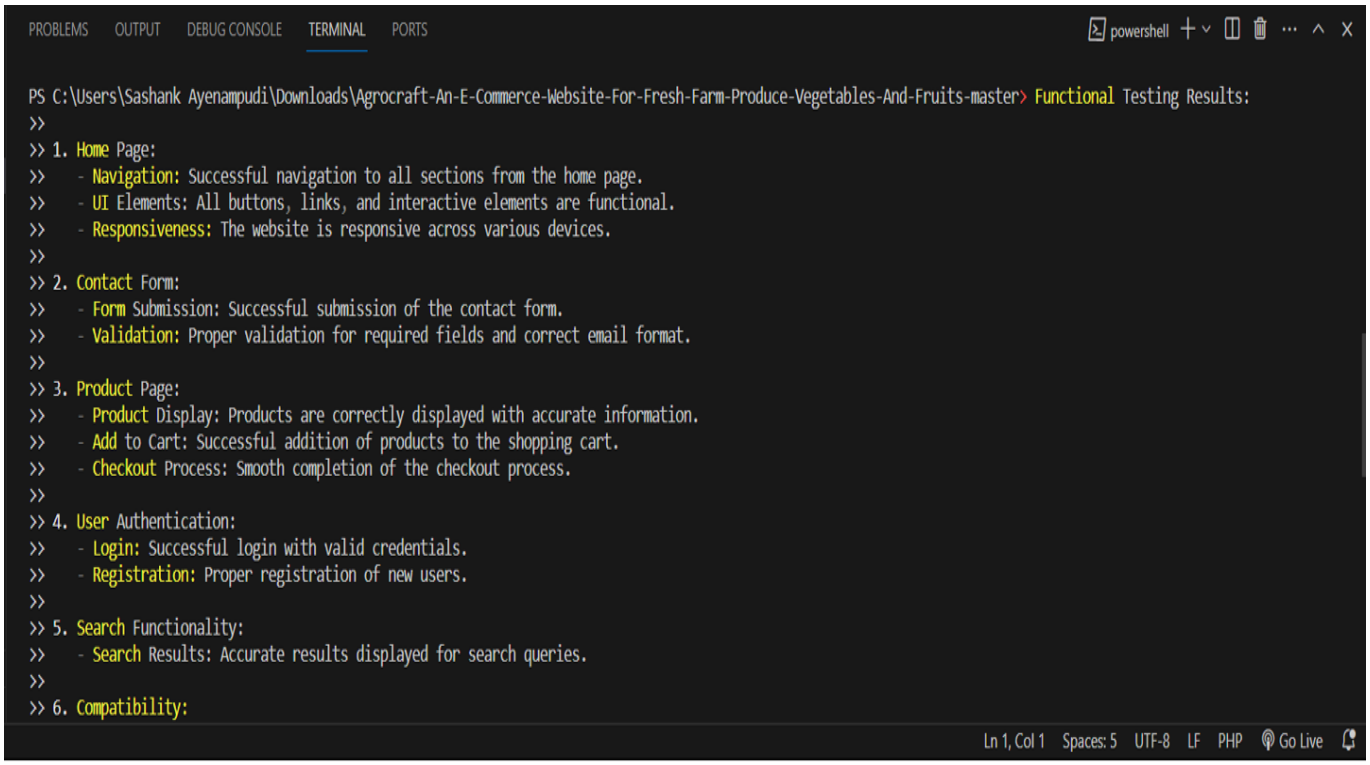

Figure 5.2: **Functional Testing for Agricultural Transactions**

The figure 5.2 illustrates the process of functional testing, a crucial stage in software testing aimed at verifying whether a software application's functions and features operate as intended. This visual representation typically showcases the interaction between different system components and the inputs and outputs of various functionalities.

Chapter 6

RESULTS AND DISCUSSIONS

6.1 Efficiency of the Proposed System

The efficiency of the proposed agricultural marketing website lies in its simplicity, user-centric design, and seamless functionality facilitated by the PHP backend. The absence of complex machine learning algorithms contributes to a straightforward and easily maintainable system. The user-friendly interface ensures that farmers and consumers can navigate the platform effortlessly, fostering a positive and efficient user experience. One key aspect of efficiency is the website's ability to bridge the gap between farmers and consumers through direct interaction. The PHP backend allows for dynamic content generation, enabling real-time market updates, product listings, and effective communication channels.

This streamlined approach enhances the accessibility and transparency of the agricultural marketplace, contributing to the system's overall efficiency. Additionally, the simplicity of the PHP backend not only ensures ease of maintenance but also lays the foundation for potential scalability and future enhancements. By focusing on straightforward yet effective functionalities, the proposed system aims to create an efficient and accessible platform that meets the needs of both farmers and consumers in the agricultural marketing ecosystem.

6.2 Comparison of Existing and Proposed System

Existing system:

The current agricultural marketing landscape relies heavily on traditional methods, characterized by fragmented processes and a lack of direct communication between farmers and consumers. In this system, intermediaries play a significant role, introducing inefficiencies and reducing the profit margins for farmers. Limited accessibility to real-time market information further exacerbates challenges.

Proposed system:

In contrast, the proposed agricultural marketing website, developed with a simple PHP backend, introduces a transformative shift by directly connecting farmers with consumers. By leveraging dynamic content generation, the platform ensures real-time market updates, product listings, and streamlined communication channels. The absence of complex machine learning algorithms enhances system simplicity and ease of maintenance, while the user-friendly interface contributes to a seamless and efficient user experience. This proposed system addresses the shortcomings of the existing model, fostering transparency, accessibility, and direct interaction within the agricultural marketplace.

6.3 Sample Code

```
<!-- <?php
// include("../Includes/db.php");
// session_start();
// $sessphonenumber = $_SESSION['phonenumber'];
// $sql = "select * from farmerregistration where farmer_phone = '$sessphonenumber' ";
// $run_query = mysqli_query($con, $sql);
// while ($row = mysqli_fetch_array($run_query)) {
//     $name = $row['farmer_name'];
//     $phone = $row['farmer_phone'];
//     $address = $row['farmer_address'];
//     $pan = $row['farmer_pan'];
//     $bank = $row['farmer_bank'];
//     $state = $row['farmer_state'];
//     $district = $row['farmer_district'];
// }
?> -->
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <title>Farmer Profile</title>
     <link rel="stylesheet" href="../portal_files/bootstrap.min.css">
     <script src="../portal_files/jquery.min.js.download"></script>
     <script src="../portal_files/popper.min.js.download"></script>
     <script src="../portal_files/bootstrap.min.js.download"></script>
</head>
<body>
    <div class="container-fluid" style="max-width:520px">
        <form action="EditProfile.php" method="post">
```

```
32              <table align="center">
33                  <tr colspan=2>
34                      <h1> FARMER'S PROFILE</h1>
35                  </tr>
36                  <tr align="center">
37                      <td><label><b>Name :</b></label></td>
38                      <td>
39                          <!-- <textarea rows="2" column="10" disabled> <?php echo $name ?> </textarea> -->
40                          <input type="text" readonly class="form-control-plaintext border border-dark" id="staticE
41                      <br></td>
42                  </tr>
43                  <tr align="center">
44                      <td><label><b>Phone Number :</b></label></td>
45                      <td><textarea rows="2" column="10" disabled> <?php echo $phone ?> </textarea><br></td>
46                  </tr>
47                  <tr align="center">
48                      <td><label><b>Address :</b></label></td>
49                      <td><textarea rows="3" column="56" disabled> <?php echo $address ?> </textarea><br></td>
50                  </tr>
51                  <tr align="center">
52                      <td><label><b>State :</b></label></td>
53                      <td><textarea rows="3" column="56" disabled> <?php echo $state ?> </textarea><br></td>
54                  </tr>
55                  <tr align="center">
56                      <td><label><b>District :</b></label></td>
57                      <td><textarea rows="3" column="56" disabled> <?php echo $district ?> </textarea><br></td>
58                  </tr>
59                  <tr align="center">
60                      <td><label><b>Account Number :</b></label></td>
61                      <td><textarea rows="2" column="10" disabled> <?php echo $bank ?> </textarea><br></td>
62                  </tr>
63                  <td colspan=2><input type="submit" name="editProf" value="Edit Profile"></td>
64                  </tr>
65              </table>
66          </form>
67      </div>
68  </body>
69  </html>
```

Output

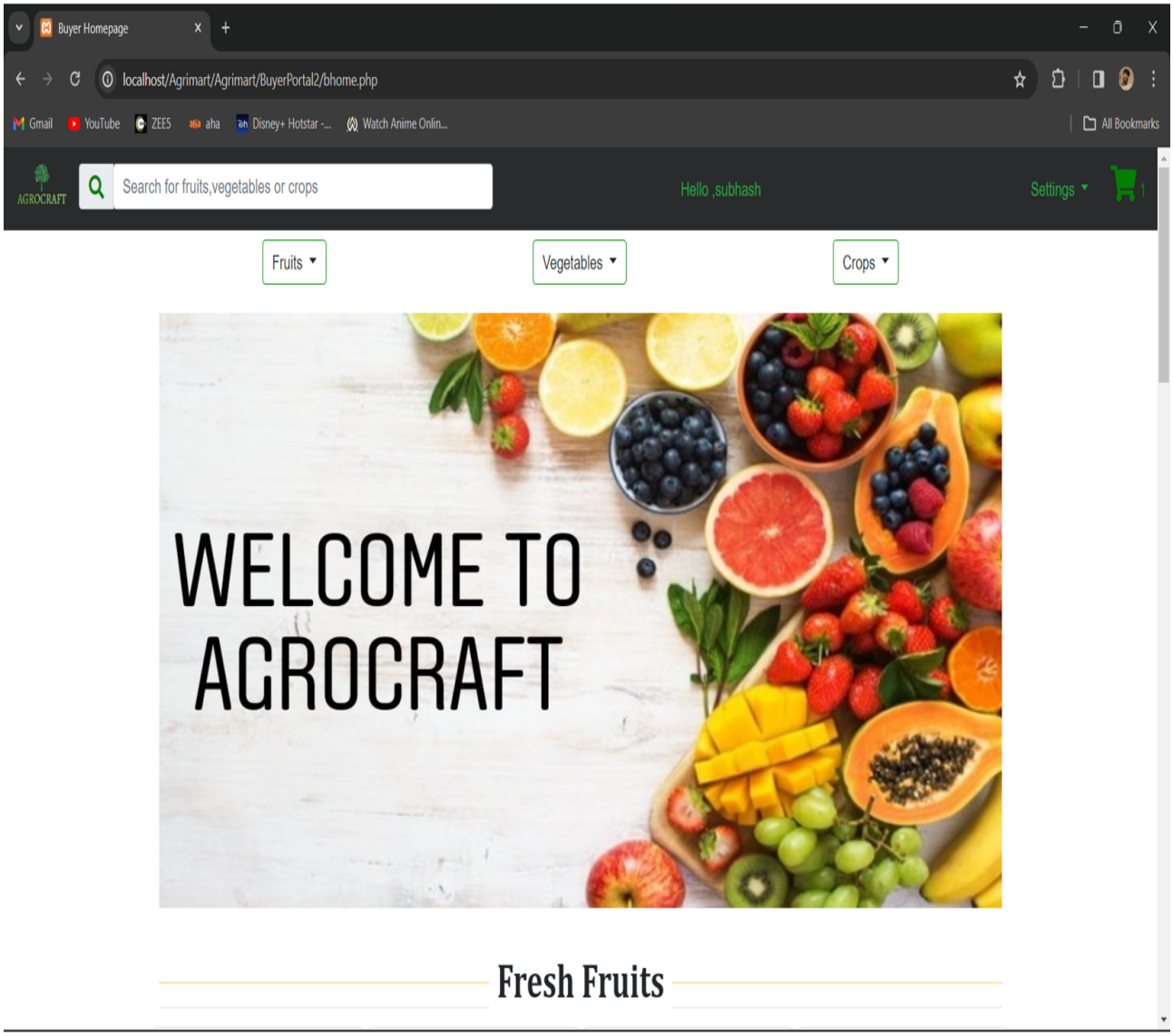

Figure 6.1: **Home Page for Agricultural Transactions**

The figure 6.1 depicts the home page of our agricultural marketing website showcases a visually appealing layout, featuring dynamically displayed products with names and prices, offering an navigation experience and an interactive search function for efficient exploration.

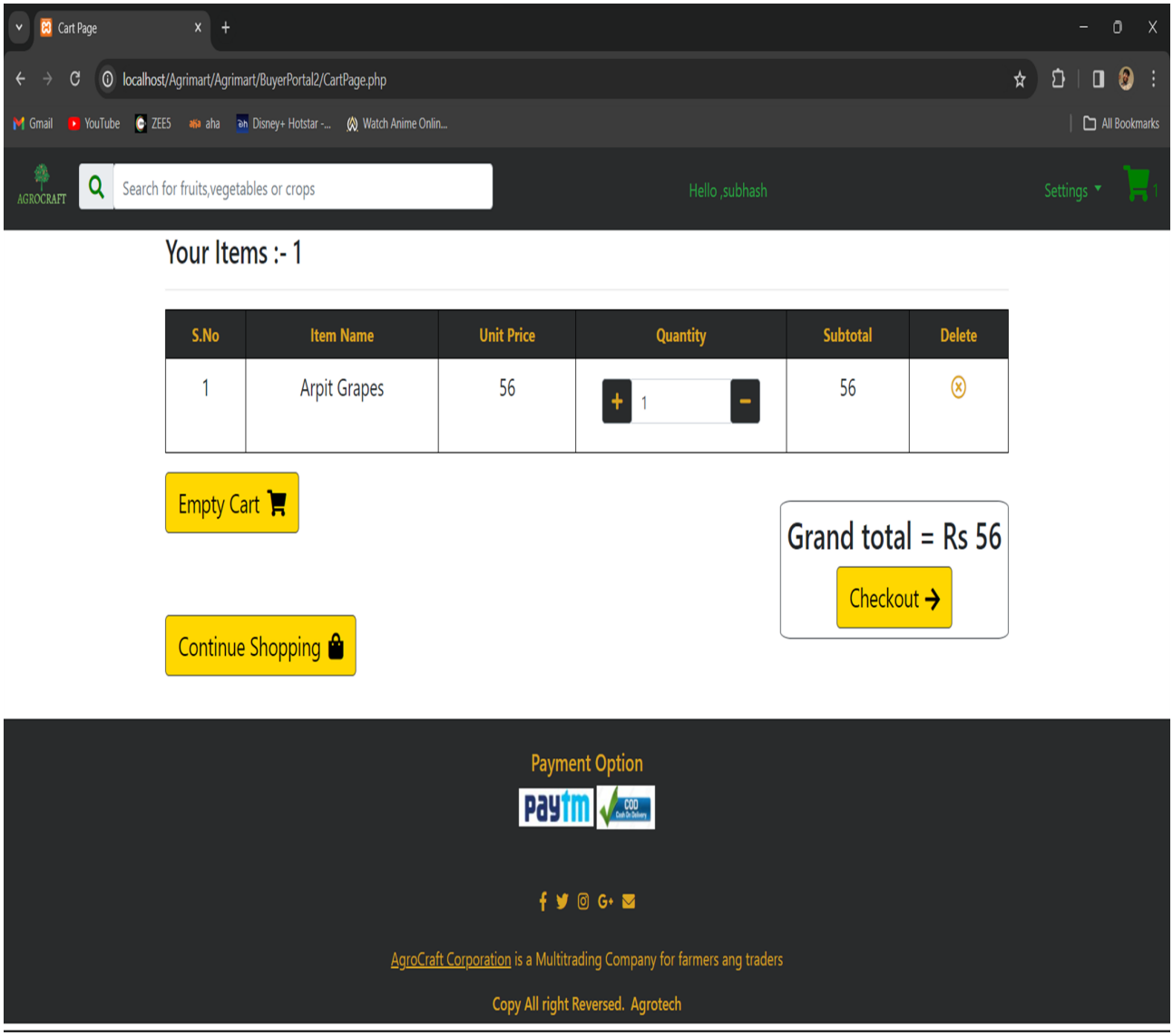

Figure 6.2: **Output for Agricultural Transactions**

The figure 6.2 represents the cart page on our agricultural marketing website provides a streamlined and user-friendly interface for customers to review and manage their selected products, facilitating a seamless shopping experience with clear product details and a straightforward checkout process.

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Conclusion

In conclusion, the survey highlights the multifaceted challenges in our regional agricultural marketing, encompassing limited market access, price volatility, quality control issues, and food safety concerns. These hurdles impact both producers and consumers, casting a shadow on the sustainability of the current system. However, the findings also unveil a promising path forward. By implementing recommended strategies, including infrastructure investments, enhanced market information systems, sustainable practices, and the integration of digital technologies, we can effectively address these challenges. Strengthening regulatory frameworks, supporting farmer cooperatives, and launching consumer education campaigns are integral components of this transformative journey.

This comprehensive approach not only tackles existing challenges but also aligns with evolving consumer preferences and sustainability goals, paving the way for a thriving agricultural marketing system that benefits all stakeholders. In embracing these strategies, we envision a future where agricultural marketing is characterized by transparency, efficiency, and sustainability. Through collective efforts, we can cultivate a resilient ecosystem that maximizes benefits for farmers, ensures quality for consumers, and aligns harmoniously with the broader goals of sustainability.

7.2 Future Enhancements

Looking to the future, strategic enhancements in agricultural marketing can pave the way for innovation and resilience. The integration of cutting-edge technologies, such as Artificial Intelligence and the Internet of Things, holds tremendous potential. AI's predictive analytics can revolutionize market forecasting, enabling stakeholders to anticipate trends and optimize decision-making, while the IoT can enhance supply chain management through real-time monitoring, ensuring quality produce and minimizing waste.

In addition, fostering collaboration among stakeholders is crucial for the future evolution of agricultural marketing. Establishing digital platforms for direct communication and transactions can streamline the supply chain, creating efficiency. Public-private partnerships can drive research and development, fostering innovation and the adoption of sustainable practices. Moreover, exploring global market integration and utilizing e-commerce platforms can open doors for farmers to access international markets, ensuring the long-term viability of agriculture. These combined efforts aim to transform agricultural marketing into a dynamic, interconnected system, maximizing efficiency, embracing sustainability, and meeting the evolving needs of a rapidly changing world.

Chapter 8

PLAGIARISM REPORT

Figure 8.1: **Plagarism Report for Agricultural Transactions**

Chapter 9

SOURCE CODE & POSTER PRESENTATION

9.1 Source Code

```
<!-- <?php
     include("../Functions/functions.php");
     ?> -->
<!DOCTYPE html>
<html>
<head>
     <meta http-equiv="Content-Type" content="text/html; charset=windows-1252">
     <meta name="viewport" content="width=device-width, initial-scale=1.0">
     <title>Farmer Homepage</title>
     <!-- <link rel="stylesheet" href="portal_files/font-awesome.min.css"> -->
     <!-- <script src="../portal_files/c587fc1763.js.download" crossorigin="anonymous"></script> -->
     <link rel="stylesheet" href="../portal_files/bootstrap.min.css">
     <script src="../portal_files/jquery.min.js.download"></script>
     <script src="../portal_files/popper.min.js.download"></script>
     <script src="../portal_files/bootstrap.min.js.download"></script>
</head>
<body>
     <div class="header">
          <a href="Homepage.php"><img id="logo" src="../portal_files/logo.jpg"></a>
          <div class="dropdown">
               <button class="btn btn-default dropdown-toggle" type="button" id="menu1" data-toggle="dropdown" st
                    <i class="fa fa-bars fa-2x" style="color: white;">
               </button></i>
               <ul class="dropdown-menu etc">
                    <?php
                    if (isset($_SESSION['phonenumber'])) {
                         echo "<li class='options'> <a href='FarmerProfile.php'><label class='makeitgreen'>Profil
                         echo "<li class='options'> <a href='Orders.php'><label class='makeitgreen'>Orders</label
                         echo "<li class='options'> <a href='logout.php'><label class='makeitgreen'>Logout</label
                    } else {
                         echo "<li class='options'> <a href='../auth/FarmerLogin.php'><label class='makeitgreen'>
                    }
                    ?>
               </ul>
          </div>
```

```
        <div class="proicon">
            <?php
            if (!isset($_SESSION['phonenumber'])) {
                echo "<a href='../auth/FarmerLogin.php'> <i class='far fa-user-circle ' style='font-size:30px
            } else {
                echo "<a href='FarmerProfile.php'> <i class='far fa-user-circle' style='font-size:30px; color
            }
            ?>
        </div>
        <div class="loginz">
            <?php getFarmerUsername(); ?>
        </div>
    </div>
    <br>
    </div>
    <div class="headerdown">
        <a href="Homepage.php" id="navbar"><i class="fa fa-home" aria-hidden="true"></i><label>Home</label></a>
        <a href="MyProducts.php" id="navbar"><i class="fa fa-leaf" aria-hidden="true"></i><label>My Products</l
        <a href="Transactions.php" id="navbar"><i class="fa fa-exchange" aria-hidden="true"></i><label>My Trans
        <a href="CallCenter.php" id="navbar"><i class="fa fa-phone fa-rotate-vertical" aria-hidden="true"></i><
        <hr>
    </div>
    <div class="slideshow" id="showing">
        <div id="carouselExampleIndicators" class="carousel slide" data-ride="carousel">
            <ol class="carousel-indicators">
                <li data-target="#carouselExampleIndicators" data-slide-to="0" class=""></li>
                <li data-target="#carouselExampleIndicators" data-slide-to="1" class="active"></li>
                <li data-target="#carouselExampleIndicators" data-slide-to="2"></li>
            </ol>
            <div class="carousel-inner">
                <div class="carousel-item">
                    <img class="images1" src="../Images/Website/Farmer1.jpeg" height="500px" width="1350px"
                    <div class="time"></div>
                </div>
                <div class="carousel-item active">
                    <img class="images1" src="../Images/Website/Farmer2.jpeg" height="500px" width="1350px"
                </div>
                <div class="carousel-item">
                    <img class="images1" src="../Images/Website/Farmer4.jpg" height="500px" width="1350px" a
                </div>
            </div>
        </div>
    </div>
<div class="pictus">
        <div class=content_item><label style="font-size :40px; text-shadow: 1px 1px 1px gray;"><b>Features</b><
        <table>
            <tr>
                <td><label class="imag1_under"><b>Fixed Price Selling</b>
                        Registered buyers can order organic products online by making online payment for th
                </td>
```

```
                    <td><label class="imag2_under">
                              <b> Enquiry Based Buying</b>
                              Registered buyers can place enquiry of a product and eligible sellers can place the
                    </td>
                    <td><label class="imag3_under">
                              <b> Raising Future Demands</b>
                              Registered buyers can place their request for products which will be produced by th
                    </td>
               </tr>
          </table>
     </div>
     <img class="whats" src="../Images/Website/whats.jpeg">
     <div class="whatsnew">
          <!-- <img class="whats" src="../Images/Website/whats.jpeg"> -->
          <div class="f1 f2">
               <div class="t1"> SMS SYSTEM </div>
               <!-- <img class="images1" src="../Images/Website/back.jpg"> -->
          </div>
          <div class="f1 f3">
               <div class="t1"> CALL CENTER </div>
          </div>
          <div class="f1 f4">
               <div class="t1 t4"> PAYTM & OTHER OPTIONS</div>
          </div>
          <div class="f1 f5">
               <div class="t1 t5">WIDE RANGE OF BUYERS
               </div>
          </div>
     </div>
     <div class="slideshow" id="showing">
          <div id="carouselExampleIndicators" class="carousel slide" data-ride="carousel">
               <ol class="carousel-indicators">
                    <li data-target="#carouselExampleIndicators" data-slide-to="0" class=""></li>
                    <li data-target="#carouselExampleIndicators" data-slide-to="1" class="active"></li>
                    <li data-target="#carouselExampleIndicators" data-slide-to="2"></li>
               </ol>
               <div class="carousel-inner">
                    <div class="carousel-item">
                         <img class="images1" src="../Images/Website/quote1.jpeg" height="500px" width="1350px" a
                         <div class="time"></div>
                    </div>
                    <div class="carousel-item active">
                         <img class="images1" src="../Images/Website/quote1.jpeg" height="500px" width="1350px" a
                    </div>
                    <div class="carousel-item">
                         <img class="images1" src="../Images/Website/quote1.jpeg" height="500px" width="1350px" a
                    </div>
               </div>
          </div>
     </div>
```

```
136     <div class="morefooter">
137         <div class="call">
138             <i class="fas fa-phone-alt call_color"></i>
139             <a href="#" style="color:black;">+91-8191046421</a>
140         </div>
141         <div class="instagram"><img src="../Images/Website/Insta.jpg" height="45px" width="60px">
142         </div>
143         <div class="gmail">
144             <img src="../Images/Website/gmail.jpg" height="30px" width="50px">
145         </div>
146     </div>
147     <div class="instaid">
148         <div class="text"><a href="#" style="color:black;">@AgroCraft</a></div>
149         <div class="gmailid">
150             <a href="#" class="hypher" style="color:black;">agrocraft6@gmail.com</a>
151         </div>
152     </div>
153 </body>
154 </html>
```

9.2 Poster Presentation

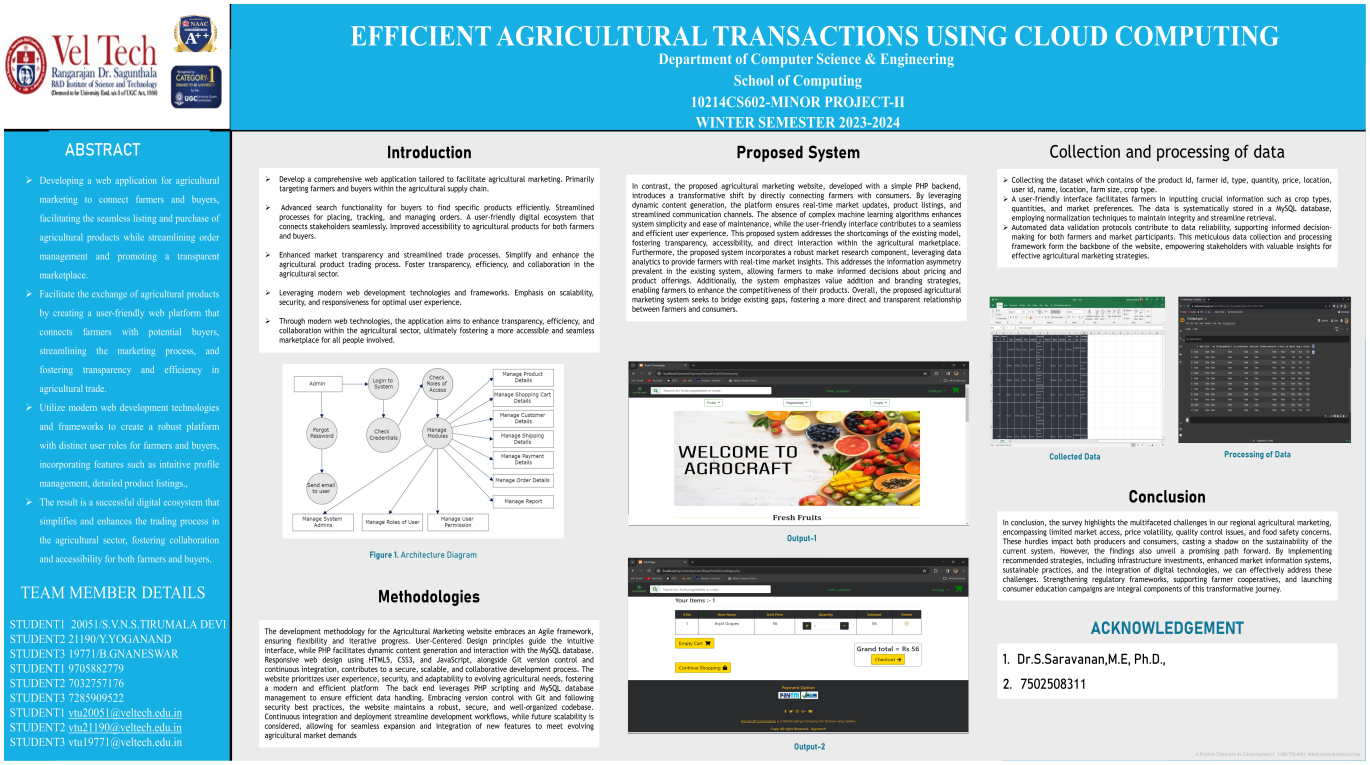

Figure 9.1: **Poster Presentation for Agricultural Transactions**

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