

EMPOWERING LOCAL RENTALS WITH INTERNET OF THINGS(IOT)

*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

**VEERAGANDHAM KAVYANJALI (21UECS0662) (VTU20004)
UTKALLU CHAITANYA KUMAR (21UECS0644) (VTU19949)
POOJARI NEERAJA (21UECS0483) (VTU19613)**

*Under the guidance of
Dr.D.Umanandhini,M.E.,Ph.D.,
Professor*



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SCHOOL OF COMPUTING**

**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 "EMPOWERING LOCAL RENTALS WITH INTERNET OF THINGS(IOT)" by "VEERAGANDHAM KAVYANJALI (21UECS0662), UTKALLU CHAITANYA KUMAR (21UECS0644), POOJARI NEERAJA (21UECS0483)" has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

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May, 2024

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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.

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Date: / /

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(POOJARI NEERAJA)

Date: / /

APPROVAL SHEET

This project report entitled "EMPOWERING LOCAL RENTALS WITH INTERNET OF THINGS(IOT)" by VEERAGANDHAM KAVYANJALI (21UECS0662), UTKALLU CHAITANYA KUMAR (21UECS0644), POOJARI NEERAJA (21UECS483) is approved for the degree of B.Tech in Computer Science & Engineering.

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Place:Avadi.

ACKNOWLEDGEMENT

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

It represents a revolutionary response to the inherent challenges in the agricultural landscape. The platform redefines farming practices by providing an on-demand rental service for a vast array of farming equipment. Beyond a conventional rental system, this introduces a dynamic marketplace where farmers can not only rent but also buy, sell, or share machinery. This approach not only makes farming more efficient but also encourages sustainable and collaborative practices. By integrating advanced technology with agriculture, it becomes a catalyst for modernization, enhancing productivity, and ensuring a more sustainable future for the farming community. With a user-friendly interface and a commitment to environmental responsibility, AgZone emerges as a transformative force. The platform envisions a brighter, more connected future for agriculture, empowering farmers and ushering in a new era of efficiency and sustainability. It provides a unified marketplace where farmers, suppliers, and agricultural enthusiasts can connect, collaborate, and fulfill diverse needs. Whether farmers seek to buy, sell, or rent equipment, seeds, or produce, the platform offers a dynamic ecosystem catering to various agricultural requirements. Beyond transactions, it fosters a sense of community by digitally connecting farmers and agribusinesses, enabling collaboration and knowledge sharing. Employees transport equipment to the farmer's location at the agreed time. The backend system matches requests with nearby available equipment and connects farmers with suitable employees who own the machinery.

Keywords: Agricultural equipment rental; Farming solutions; On-demand services; Economic empowerment; Community engagement; Digital agriculture.

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LIST OF ACRONYMS AND ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
D2	Accessible Rich Internet Application
CSS	Cascading Style Sheets
D2D	Door To Door
FinTech	Financial Technology
GTSD	Green Technology and Sustainable Development
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
JSON	JavaScript Object Notation
ML	Machine Learning
RBI	Reserve Bank of India
SIB	Sustainable Islamic Business
SQL	Structured Query Language
UI	User Interface
XSS	Cross-Site Scripting

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Chapter 1

INTRODUCTION

1.1 Introduction

The project is project, is a revolutionary online platform designed to reshape the landscape of agriculture. In response to the evolving needs of farmers, it seamlessly integrates technology into farming practices, offering a comprehensive solution for equipment accessibility. Beyond conventional rental services, this acts as a dynamic marketplace, enabling farmers not just to rent but also to buy, sell, and share machinery. This multifaceted platform aims to enhance farming efficiency, promote sustainability, and faster collaboration within the agricultural community. With its user-friendly interface and commitment to environmental responsibility, AgZone is set to usher in a new era of modernized, tech-infused farming. The project envisions empowering farmers, bridging the gap between traditional practices and cutting-edge technology, and contributing to a more connected and sustainable future for agriculture and the platform.

In addition to its core features, AgZone can further enhance its platform by implementing several complementary elements. Firstly, integrating user profiles and a review system can foster trust and accountability among farmers. A smart matching algorithm would optimize machinery recommendations based on individual needs and geographical factors. Moreover, partnering with precision agriculture providers can bring advanced tools like soil analysis and crop monitoring to the platform, boosting farming efficiency. Developing a mobile app would improve accessibility, while offering educational resources and hosting community forums can empower farmers with knowledge and foster collaboration. Additionally, services such as insurance coverage and customer support would enhance user experience. AgZone could also explore expansion into new markets or agricultural sectors to broaden its impact. By forging partnerships with research institutions and universities, the platform can stay abreast of the latest agricultural trends and innovations. Lastly, maintaining a feedback loop for continuous improvement ensures that remains responsive to farmers' evolving needs and preferences.

1.2 Aim of the project

Revolutionizing agriculture with a user-friendly D2D online platform for renting, buying, and selling farming equipment.

1.3 Project Domain

AgZone operates in the dynamic and vital domain of AgriTech, a convergence of agriculture and technology. This domain involves the integration of innovative technological solutions to address challenges and enhance efficiency in agriculture. It specifically focuses on revolutionizing the traditional approach to farm equipment by introducing a platform that facilitates on-demand agricultural equipment rental and offers comprehensive farming solutions. The project is set within the broader context of sustainable agriculture, aiming to optimize the use of resources, increase accessibility to modern farming tools, and contribute to the overall advancement of agricultural practices.

Within the dynamic AgriTech sphere, it stands as a pioneering force, integrating agricultural practices with innovative technology solutions. The project's focus on on-demand equipment rental aligns seamlessly with the broader agenda of sustainable agriculture, emphasizing optimal resource utilization, improved accessibility to modern farming tools, and the continual enhancement of agricultural methodologies. As AgZone operates in this intricate domain, it addresses multi-faceted challenges, including equipment management intricacies, user-centric experiences, and the overarching commitment to sustainable agricultural advancements.

Here some additional content for your report, structured into paragraphs:

operates at the intersection of agriculture and technology, leveraging innovative solutions to address longstanding challenges and drive efficiency in farming practices. As a pioneer in the AgriTech domain, AgZone's primary objective is to transform the traditional approach to farm equipment management by introducing a platform that facilitates on-demand rental services and offers holistic farming solutions. This initiative is deeply rooted in the ethos of sustainable agriculture, aiming to optimize resource utilization, increase accessibility to modern farming tools, and propel the overall advancement of agricultural methodologies.

Within the dynamic AgriTech landscape, AgZone stands out as a trailblazer, seamlessly integrating agricultural practices with groundbreaking technology solutions. By prioritizing on-demand equipment rental, it aligns closely with the broader agenda of sustainable agriculture, emphasizing the importance of efficient resource allocation and the widespread adoption of modern farming tools. Moreover, here operations within this intricate domain encompass a range of challenges, including the intricacies of equipment management, the imperative of delivering user-centric experiences, and a steadfast commitment to driving sustainable agricultural advancements.

1.4 Scope of the Project

The ambit of our project, titled "AgZone," is ingeniously crafted to revolutionize the prevalent challenges embedded in the agricultural domain. Informed by a meticulous analysis of the agricultural landscape, our project's scope radiates across various dimensions, merging technological prowess, community collaboration, and a commitment to sustainable farming practices. At its nucleus, it strives to democratize access to a vast spectrum of agricultural machinery. Initially targeting regions with a robust agricultural presence, our project's scope extends beyond conventional equipment, ushering in cutting-edge technologies. Collaborations with equipment manufacturers are envisioned to forge a dynamic network ensuring a constant inflow of state-of-the-art machinery.

Technological integration is a pivotal axis of our project's scope. It envisions the incorporation of emerging technologies such as the Internet of Things, allowing real-time monitoring of equipment health and usage patterns. The project matures beyond physical machinery, embracing a sophisticated online portal and a user-friendly mobile application to ensure accessibility across diverse technological landscapes. Collaboration forms the cornerstone of AgZone's scope, reaching beyond transactional facilitation to meaningful engagements with agricultural associations, manufacturers, and governmental bodies. These partnerships are envisaged not only to extend the platform's reach but to contribute to the holistic growth of the agricultural sector.

Chapter 2

LITERATURE REVIEW

[1] Kiran .“Impact of Digital Financial Services on the Profitability Performance of Banks in India.”2022 Interdisciplinary Research in Technology and Management (IRTM), 2022. This paper aims to find the impact of digital financial services on the profitability performance of commercial banks in India. Recently, the Indian banking industry has witnessed the rollout of digital and innovative banking models. The immense growth of digital financial services makes a significant impact on the performance of Indian banks. Panel data regression was adopted to find the impact of digital financial services on profitability performance. Forty-four banks and an eight-time period are considered for the study. The data suffers from both heteroscedasticity and serial correlation. Panel Corrected Standard Error estimation was used to overcome these problems. Four models were used to assess the bank profitability. The coefficient of digital financial services variables is found to be significant. This indicates that digital banking facilities could enhance the financial performance of banks. To ensure further utilization of digital financial services by the public, with the help of the Payment and settlement system, the RBI should focus more on providing electronic services facilities on a larger scale to the public and ensuring security and making the process more efficient cost-effective for the banks.

[2] Megha Jaiwani ,Shiba Prasad Mohanty et.al ., in 2022 Digital innovation is redefining industries and changing the way businesses function. Digitisation and innovative technologies are creating unprecedented disruption in the banking sector. In the conundrum of technological advancements, E-banking has evolved into one of the most critical banking services that, when effectively implemented, may improve customer contentment while also providing banks with a competitive advantage. In this context, the study empirically evaluates the number and types of e-banking services used by customers of different banks and their satisfaction after using the technology-based services based on service quality dimensions like Ease/Convenience of use, reliability, security, responsiveness and personalisation. The study further examines the relationship between customer satisfaction, their be-

havioural intentions and change in their banking habits on using the e-banking services to gauge its impact on the banking industry. Primary data was collected from 200 respondents across PAN India using a structured questionnaire, explicitly targeting regions where e-banking services are not fully embraced. A random sampling technique was used to gather responses. Data interpretation was made using graphs and tables. Whereas data analysis was performed using statistical tools such as multiple regressions and univariate regressions to determine the impact of e-banking service delivery on the customers' satisfaction with banks. The study exhibited that service quality has a favourable influence on customer satisfaction and that there is a positive association between customer satisfaction and behavioural intention. On the contrary, given data constraints, the study could not empirically establish the relationship between customer satisfaction and banking habits.

[3] M.Mirsath Begum ,“Analysis and Adoption of Mobile Banking: An E-Banking System.”2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS), 2021.Analysis of 1969 nationalization banks including 14 major business banks in the Indian E- banking system was operated internally. Public policy goals were driving force, with banks mainly engaged in modernizing the customers' deposits, funds to various sectors of the economy, and increasing public deficit money. Technology in modern banking has greatly advanced from the back office outsourcing to the electronic, centralized, and automated approaches of today. The rapid trends can be found within the financial sector. The growth of overall economic and global markets has a role to play in transforming the modern banking scenario.

[4] Nipun Mehndiratta, Ginni Arora, Ruchika Bathla et.al., in 2022 The banking industry is rapidly adopting artificial intelligence (AI)-enabled technologies to improve efficiency, reduce costs, and enhance customer experience. The paper utilizes case studies and data from various research papers to analyze the use of AI in different areas of the banking industry. The paper highlights that AI-enabled technologies can be applied in various areas of the banking industry, with significant potential for improving decision making, reducing the risk of fraud, and enhancing customer experience. The study also provides examples of AI implementations in various banking domains, such as risk assessment, credit approval process, investment/portfolio management, and others. The use of AI in fraud detection, personalized financial

advisory services, and automated customer support is discussed in detail, including examples from major financial institutions. Additionally, the paper discusses how AI can be used in claims management, wealth management, and loan and credit management. Several research studies have been reviewed that propose AI-based credit scoring models and loan underwriting systems to enhance the accuracy and efficiency of loan management processes. Overall, this paper provides a comprehensive survey of the opportunities and challenges associated with the use of AI in the banking industry, highlighting the potential for AI to transform the way banks operate and serve their customers.

[5] Prasad Mohanty, and Nilaya Murthy et.al., “Understanding Service Quality, Customer Satisfaction, and Banking Behaviour from an E-Banking Perspective: An Empirical Approach” 2022 Digital innovation is redefining industries and changing the way businesses function. Digitisation and innovative technologies are creating unprecedented disruption in the banking sector. In the conundrum of technological advancements, E-banking has evolved into one of the most critical banking services that, when effectively implemented, may improve customer contentment while also providing banks with a competitive advantage. In this context, the study empirically evaluates the number and types of e-banking services used by customers of different banks and their satisfaction after using the technology-based services based on service quality dimensions like Ease/Convenience of use, reliability, security, responsiveness and personalisation. The study further examines the relationship between customer satisfaction, their behavioural intentions and change in their banking habits on using the e-banking services to gauge its impact on the banking industry. Primary data was collected from 200 respondents across PAN India using a structured questionnaire, explicitly targeting regions where e-banking services are not fully embraced. A random sampling technique was used to gather responses. Data interpretation was made using graphs and tables. Whereas data analysis was performed using statistical tools such as multiple regressions and univariate regressions to determine the impact of e-banking service delivery on the customers’ satisfaction with banks.

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[7] V.Gowtham Raaj,. "Analysis and Adoption of Mobile Banking: An E-Banking System."2021 7th International Conference on Advanced Computing and Communication . Analysis of 1969 nationalization banks including 14 major business banks in the Indian E- banking system was operated internally. Public policy goals were driving force, with banks mainly engaged in modernizing the customers' deposits, funds to various sectors of the economy, and increasing public deficit money. Technology in modern banking has greatly advanced from the back office outsourcing to the electronic, centralized, and automated approaches of today. The rapid trends can be found within the financial sector. The growth of overall economic and global markets has a role to play in transforming the modern banking scenario.

Chapter 3

PROJECT DESCRIPTION

3.1 Existing System

In the contemporary agricultural landscape, the prevailing system revolves around individual ownership of farming equipment. Farmers, whether operating on a small or larger scale, traditionally own the machinery crucial for various farming tasks. This paradigm has been deeply entrenched in agricultural practices, shaping the relationship between farmers and their tools. From tractors to specialized implements, the ownership model has been the norm for generations.

Several challenges define the current agricultural system. First and foremost is the financial barrier, where the significant investment needed for equipment ownership poses challenges for farmers, especially those with limited resources. The under utilization of machinery is another critical issue, impacting efficiency and contributing to cost inefficiencies. Access disparities are prevalent, particularly affecting small-scale farmers who may lack access to the latest agricultural technologies. Moreover, the responsibility of maintenance and repairs falls squarely on the farmers, adding a layer of complexity and resource demand to the existing system.

3.1.1 Disadvantages of Existing System

The current agricultural system, dominated by individual ownership of farming equipment, presents several notable disadvantages. One of the primary drawbacks is the substantial financial burden placed on farmers. The need for upfront investment in purchasing machinery poses a significant hurdle, especially for small-scale farmers with limited financial resources. This financial barrier restricts access to modern and efficient equipment, perpetuating disparities in technological adoption across the agricultural sector. Another critical disadvantage lies in the under utilization of owned machinery. Farmers often face periods where equipment remains inactive,

leading to inefficient resource allocation and reduced overall cost-effectiveness. The obligation of maintenance and repairs further compounds these challenges, as farmers not only bear the initial purchase costs but also ongoing operational and maintenance expenses. This model creates an additional strain on both financial and human resources.

3.2 Proposed System

AgZone introduces a transformative on-demand agricultural equipment rental platform, revolutionizing the traditional paradigm of equipment ownership. The proposed system envisions a collaborative ecosystem where farmers, regardless of scale, can access a diverse range of modern and specialized machinery precisely when needed. This innovative model not only addresses the financial barriers associated with equipment ownership but also enhances the overall efficiency, sustainability, and economic viability of agricultural practices.

The advantages of the proposed system are multifaceted. Firstly, it significantly reduces the financial burden on farmers by providing cost-effective access to a wide array of agricultural equipment. This democratization of resources ensures that even small-scale farmers can benefit from the latest technologies, thereby leveling the playing field in agriculture.

Furthermore, the proposed system incorporates smart technologies, leveraging Artificial Intelligence (AI) and Machine Learning (ML) algorithms. These technologies enhance the platform's capabilities by providing intelligent suggestions, predictive maintenance insights, and personalized user experiences. The system's user-friendly interface ensures seamless navigation, making it accessible to a diverse range of users, including those with limited technological exposure.

3.2.1 Advantages of Proposed System

The proposed AgZone system envisions a revolutionary shift in the agricultural landscape, aiming to overcome the limitations inherent in the existing system. It

is designed as a comprehensive solution, leveraging innovative technologies to connect farmers with the right agricultural equipment efficiently. By introducing a smart matching algorithm, AgZone ensures that farmers can easily find, book, and utilize the equipment they need for specific tasks. The platform prioritizes transparency, offering farmers real-time information on equipment availability and facilitating secure and seamless transactions.

Embracing a community-driven approach, AgZone fosters collaboration among farmers, enabling them to share insights and recommendations. The proposed system goes beyond mere transactional interactions, aiming to create a supportive network where farmers can benefit from collective knowledge. Security is a top priority, with robust encryption and authentication measures in place to safeguard user data and transactions. Moreover, AgZone incorporates a feedback mechanism, allowing users to provide ratings and reviews, enhancing accountability and maintaining quality standards.

3.3 Feasibility Study

3.3.1 Economic Feasibility

In evaluating the economic feasibility, the project considers the financial viability and return on investment. AgZone seeks to streamline resource allocation and reduce inefficiencies in the agricultural sector, potentially leading to significant cost savings for farmers. The economic feasibility study includes a thorough cost-benefit analysis, projecting the financial implications of implementing the AgZone platform against the anticipated benefits for both users and stakeholders.

3.3.2 Technical Feasibility

The AgZone project stands on a strong foundation of technical feasibility, driven by its innovative approach to addressing agricultural challenges. Leveraging state-of-the-art technologies, AgZone adopts a cloud-based architecture, providing scalability and flexibility to accommodate the diverse needs of users. The platform employs advanced algorithms for equipment matching, ensuring precise and efficient resource

allocation. Real-time connectivity is a key feature, allowing farmers to access the platform seamlessly, enhancing user experience.

Furthermore, the technical feasibility extends to data security, an imperative aspect given the sensitive nature of agricultural information. AgZone implements robust encryption protocols and secure authentication methods to safeguard user data, instilling trust among farmers and stakeholders. The platform's compatibility with a variety of devices ensures accessibility even in regions with varying technology infrastructures, promoting inclusivity. AgZone's technical feasibility is not confined to the present but incorporates future scalability. The architecture is designed to accommodate evolving technologies, ensuring that the platform remains at the forefront of innovation in the agricultural sector. The technical feasibility study emphasizes the adaptability, reliability, and efficiency of AgZone's technological framework, underscoring its potential to revolutionize agricultural practices.

3.3.3 Social Feasibility

In evaluating the social feasibility of AgZone, it becomes evident that the proposed platform aligns with the broader societal goals of fostering inclusivity, community collaboration, and sustainable agricultural practices. The shift from individual ownership to shared usage of farming equipment contributes to a sense of community-driven agriculture. By enabling farmers to rent and share equipment, AgZone promotes a cooperative culture that transcends individual boundaries and facilitates a network of mutual support among farmers. Moreover, the platform's user-friendly interface ensures accessibility for a diverse user base, including farmers from remote or less technologically advanced regions. The inclusivity of the system contributes to bridging the digital divide in agriculture, ensuring that farmers with varying levels of technological literacy can benefit from AgZone's offerings. From a sustainability perspective, AgZone's emphasis on optimizing the use of existing resources contributes to environmentally conscious farming practices. By reducing the underutilization of machinery and promoting efficient use, the platform indirectly supports sustainable agricultural practices, aligning with global efforts toward greener technologies.

3.4 System Specification

3.4.1 Hardware Specification

No Hardware is used.

3.4.2 Software Specification

1. HTML5 - Latest specs (Rendering and Obsolete features)
2. CSS 4.15 Latest specs ('@import' and '@media')
3. JS ES14 - Latest specs (Optimizes the described semantics)
4. Node.js 20 - Latest specs (Web Streams Application Programming Interface(API) on the global scope)
5. Express 4.x - Latest specs (Hyper Text Transfer Protocol(HTTP) utility methods and middleware at your disposal, creating a robust API is quick and easy)
6. Visual Studio Code 1.85 - Latest specs (GitHub Copilot updates)

3.4.3 Standards and Policies

Anaconda Prompt

Anaconda prompt is a type of command line interface which explicitly deals with the ML(MachineLearning) modules. And navigator is available in all the Windows,Linux and MacOS. The anaconda prompt has many number of IDE's which make the coding easier. The UI can also be implemented in python.

Standard Used: ISO/IEC 27001

Jupyter

It's like an open source web application that allows us to share and create the documents which contains the live code, equations, visualizations and narrative text. It can be used for data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning.

Standard Used: ISO/IEC 27001

Chapter 4

METHODOLOGY

4.1 System design Architecture

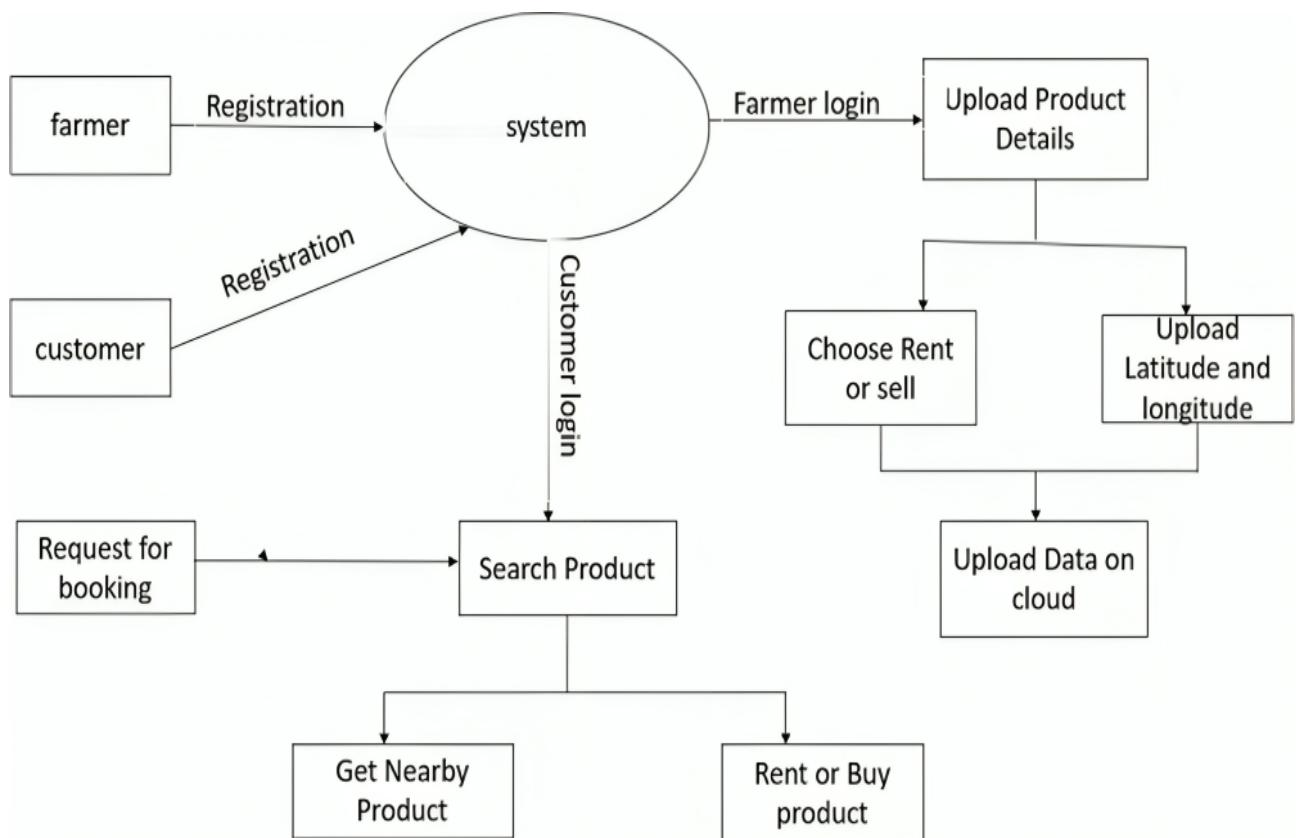


Figure 4.1: System design Architecture

The system provides an intuitive interface for users to interact with, enabling them to easily enter equipment rental details, schedule appointments, and manage their accounts. The system continuously fetches real-time data about equipment availability and market trends, ensuring users have up-to-the-minute information. Rigorous security measures protect user accounts, emphasizing the safeguarding of personal data and transaction details. Timely notifications keep users informed about their equipment rentals, account updates, and relevant agricultural events, fostering a connected and informed user experience.

4.2 Design Phase

4.2.1 Data Flow Diagram

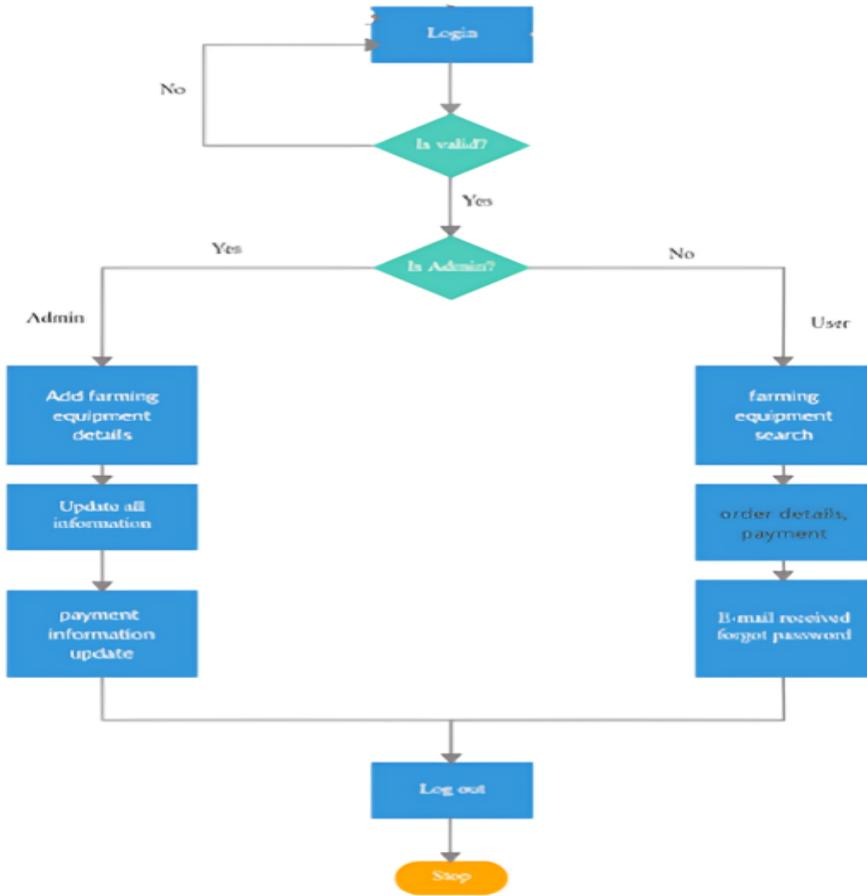


Figure 4.2: Data Flow Diagram

Here start by noting that the entire system of the Agricultural Machinery Rental System is depicted in the image. Then outline the key components of the system, which include user registration and login, comprehensive information about machinery, rent selection and booking, a dashboard for machinery owners, farmer's ability to search for machinery, payment facilities, and a system admin dashboard. Throughout the explanation, Then emphasize the efficiency and effectiveness of the Agricultural Machinery Rental System. And also note that the system's diverse functionalities enable users to efficiently rent agricultural machinery, while also allowing the system admin to monitor and manage the entire system.

4.2.2 Use Case Diagram

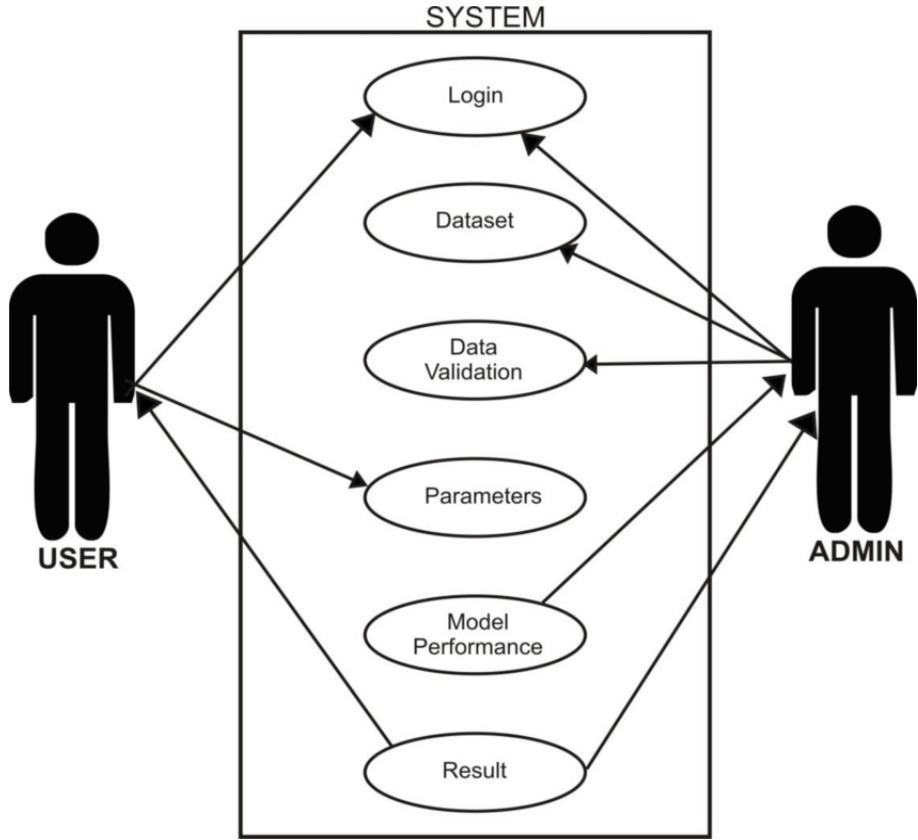


Figure 4.3: Usecase Diagram

The diagram encompasses entities such as "sign up," "login," "Equipment Rental," and "verify," indicating functionalities related to user registration, authentication, and equipment rental services. The presence of error handling, exemplified by "show 'incorrect details,'" suggests a mechanism for handling incorrect login attempts. Additionally, the system includes a rental history feature, allowing users to view their past equipment rentals. The ER diagram incorporates the concept of appointment booking, with details specifying customer information and a notification mechanism for fully booked appointments. Furthermore, it distinguishes between equipment renters and equipment owners, presenting attributes such as rental duration, date, and location. The inclusion of language options, help functionality, and contact details enhances the user experience, showcasing a user-centric design. The ER diagram reflects a comprehensive depiction of entities, relationships, and user interactions, forming a foundational representation for a feature-rich and user-friendly platform.

4.2.3 Class Diagram

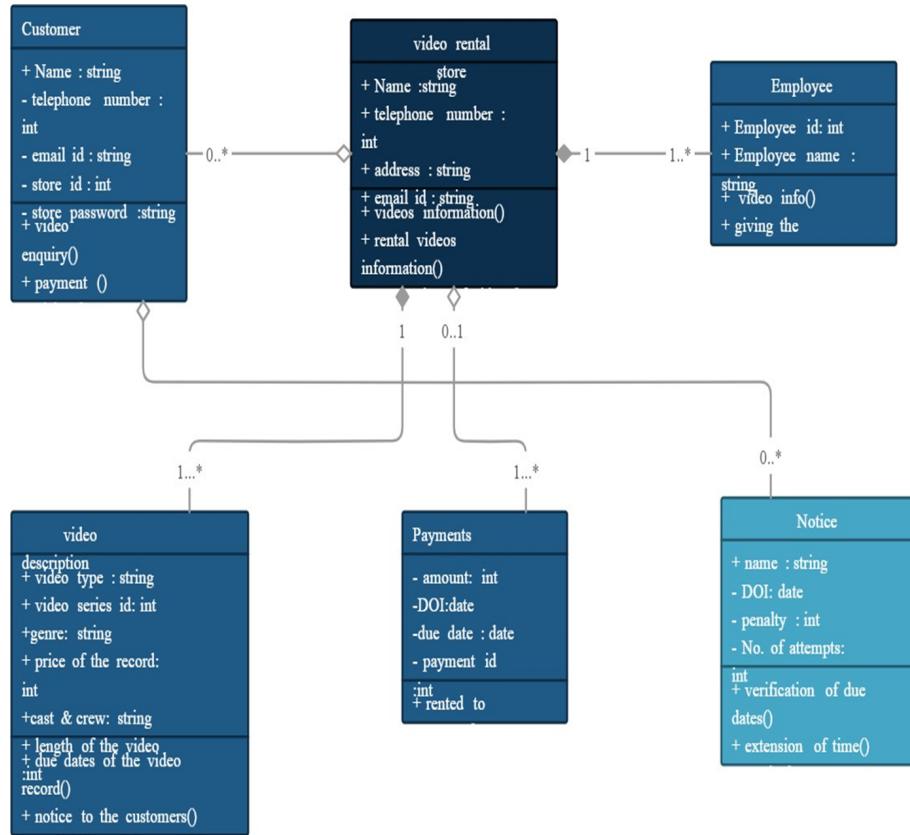


Figure 4.4: Class Diagram

Store Information: It contains information about the store such as Name, telephone number, address, email id. **Videos Information:** It provides details about the videos, including the video type, genre, price, cast crew, length, and due dates. **Rental Information:** It includes information about the rental process, such as the amount of rent, DOI (Date of Issue), due date, payment id, and the employee responsible for the rental. **Customer Information:** It provides details about the customer, including their name, telephone number, email id, store id, and store password. **Video Rental Store:** This class manages the overall video rental process. It is responsible for maintaining store information, handling video rentals, processing payments, and providing notifications to customers.

4.2.4 Sequence Diagram

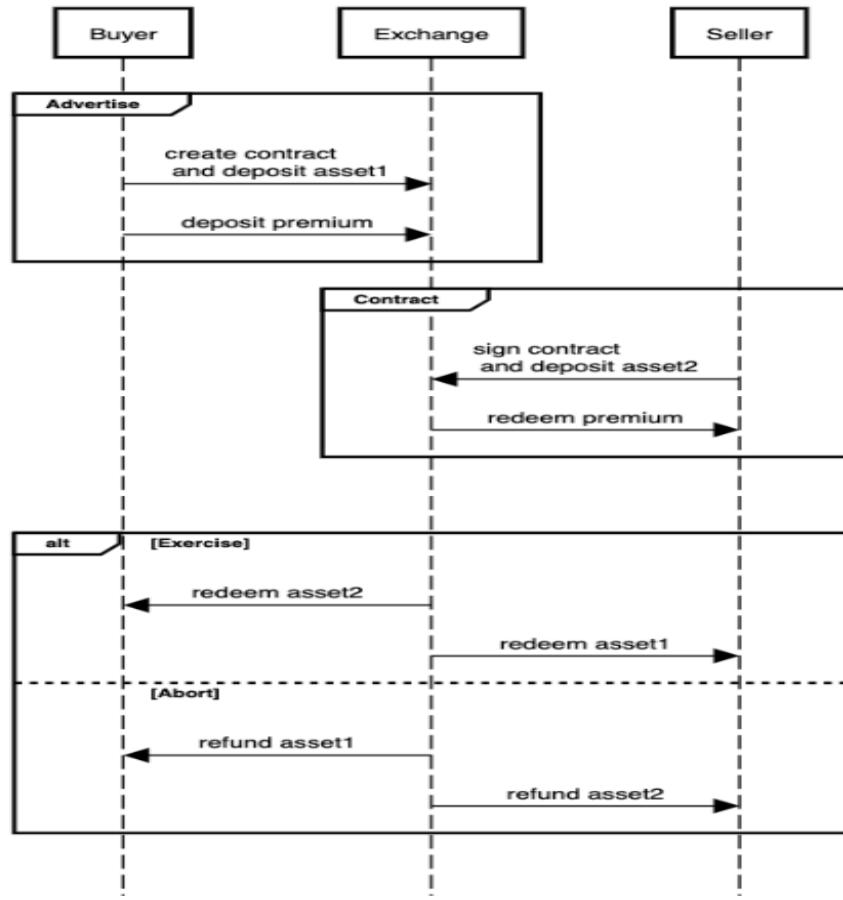


Figure 4.5: Sequence Diagram

The sequence starts with the "User" initiating the process, leading to the "Transaction" of agricultural equipment with the "Equipment Owner." The term "Request" suggests a step where equipment may be requested or searched for. The sequence involves the creation of a rental agreement, denoted by "create agreement and deposit payment," potentially outlining terms and conditions for the equipment rental. The subsequent steps include actions such as depositing a security deposit and payment, with alternative paths represented by "[Rent Equipment]" and "[Abort]." The "[Rent Equipment]" branch involves confirming the rental, while "[Abort]" leads to canceling the transaction. Throughout the sequence, there are interactions related to signing agreements, processing payments, and managing the rental process. This sequence diagram provides a visual representation of the dynamic interactions and decision points within a user-equipment owner transaction system, encompassing various steps from agreement creation to equipment rental or cancellation, capturing the intricacies of the transactional process.

4.2.5 Activity Diagram

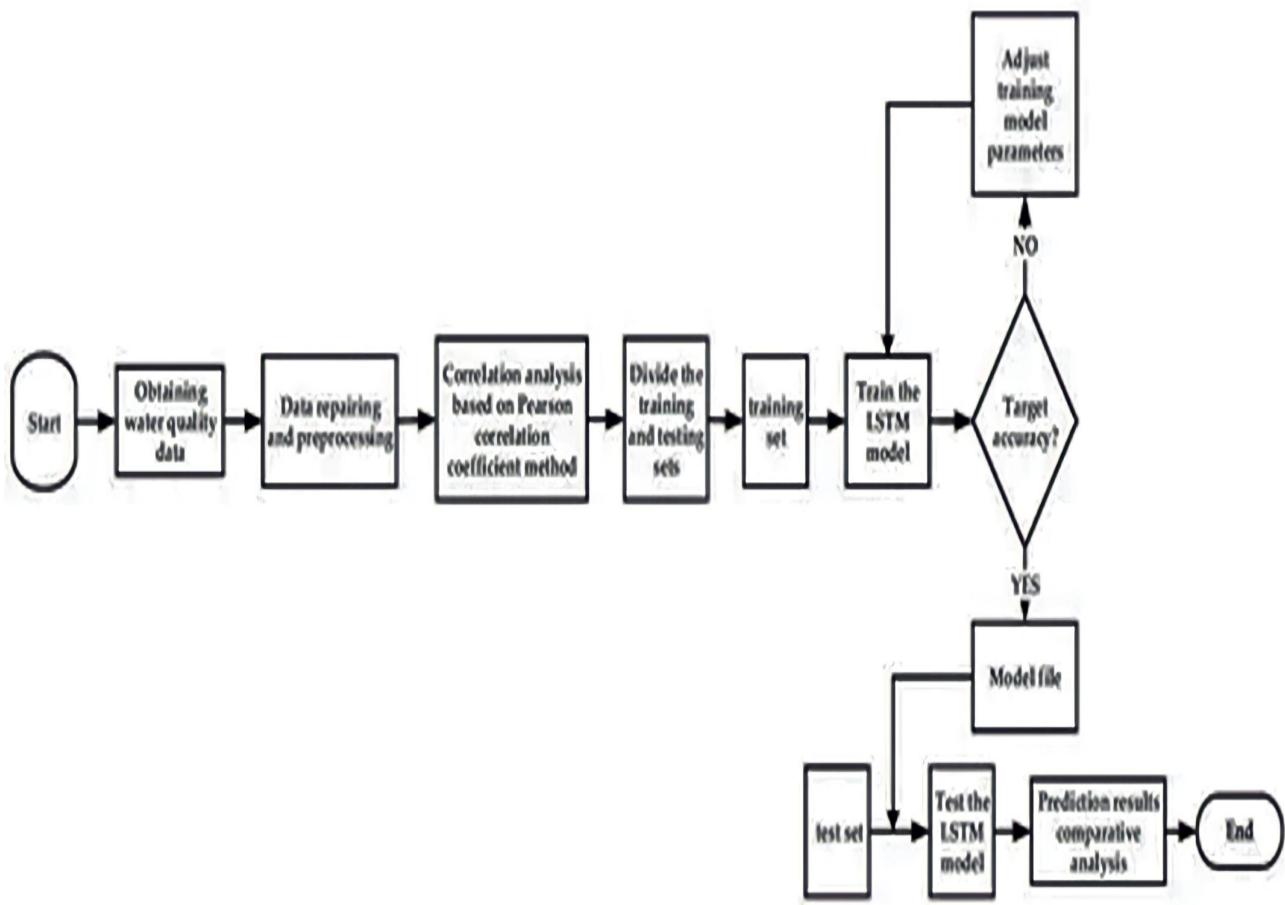


Figure 4.6: Activity Diagram

The process initiates with a user submitting a request for equipment. The system then generates a formal request, assigns it to an available equipment owner, and communicates the details to them. The equipment owner prepares the requested equipment and, upon readiness, notifies the system. The system verifies the equipment's availability and condition. If everything is in order, the system informs the user of the readiness and requests confirmation. Once confirmed, the user is invoiced for the rental, and the system finalizes the transaction. However, if there are issues with the equipment or additional requirements, the system communicates these to the equipment owner for resolution. The owner addresses the concerns, and the process loops back to equipment verification. In cases where the user requires additional equipment or services beyond the initial request, the system communicates with the user to discuss any extra charges. After resolving this with the user, the system updates the transaction details and returns to the equipment verification phase.

4.3 Algorithm & Function

4.3.1 Algorithm

- 1. User Login:** AAn authentication system allowing users to log in using either Aadhar or a phone number. Utilize authentication libraries for secure and efficient user management.
- 2. User Option Selection:** Present the user with options: "book appointment" or "request rent service." If "rent a vehicle" is chosen, gather additional details such as documents, photo, email id, location. If "give a vehicle to rent" is chosen, collect address details for scheduling purposes.
- 3. Load Calendar:** Integrate a calendar system to display available slots. Use a user-friendly interface for easy navigation.
- 4. Available Slot Times:** Populate the calendar with available slot times for both scheduling vehicles.
- 5. User Date Selection:** Allow the user to select a preferred date from the available slots in the calendar.
- 6. User Slot Timing Options:** Allow the user to select a preferred date from the available slots in the calendar.
- 7. Booking Confirmation:** Leveraging location services, the platform identifies user locations for appointment scheduling, ensuring that users can easily find and interact with equipment within their vicinity.
- 8. Location-Based Services:** Send a confirmation notification to the user's registered phone or email. Utilize push notifications for a timely and effective communication.
- 9. Booking Confirmation** After the user selects a slot, confirm the booking for either scheduler a vehicle. Implement validation checks to avoid conflicts or errors.
- 10. Notification of Confirmation:** Send a confirmation notification to the user's registered phone or email. Utilize push notifications for timely and effective communication.
- 11. Transaction Initiation:** Buyers initiate transactions by selecting desired products and specifying quantities. Sellers promptly receive notifications of purchase requests.

4.3.2 Function

1. Initialize authentication variables, including Aadhar or phone number, using authentication libraries for secure user management.
2. Present users with choices such as "Book Appointment" or "Request Rent Service."
3. Integrate a calendar system to display available slots in a user-friendly interface.
4. User Input: Prompt user to enter Option and Value.
5. Populate the calendar with available slot times for scheduling vehicles.
6. Enable buyers to initiate transactions by selecting desired products and specifying quantities.

4.4 Module Description

4.4.1 Agzone Login for booking

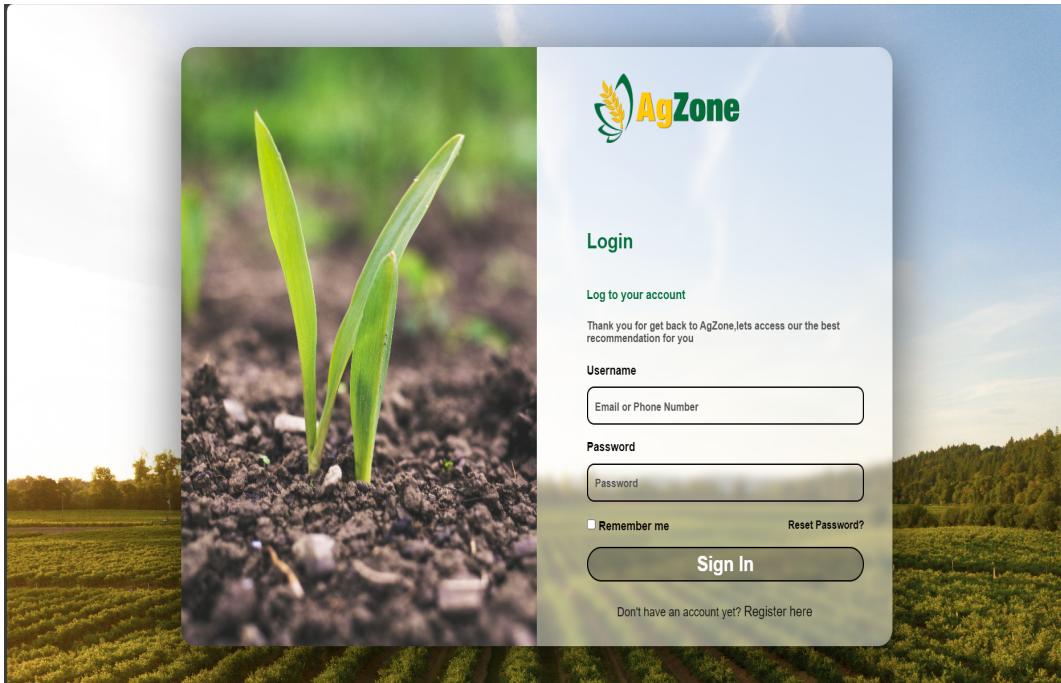
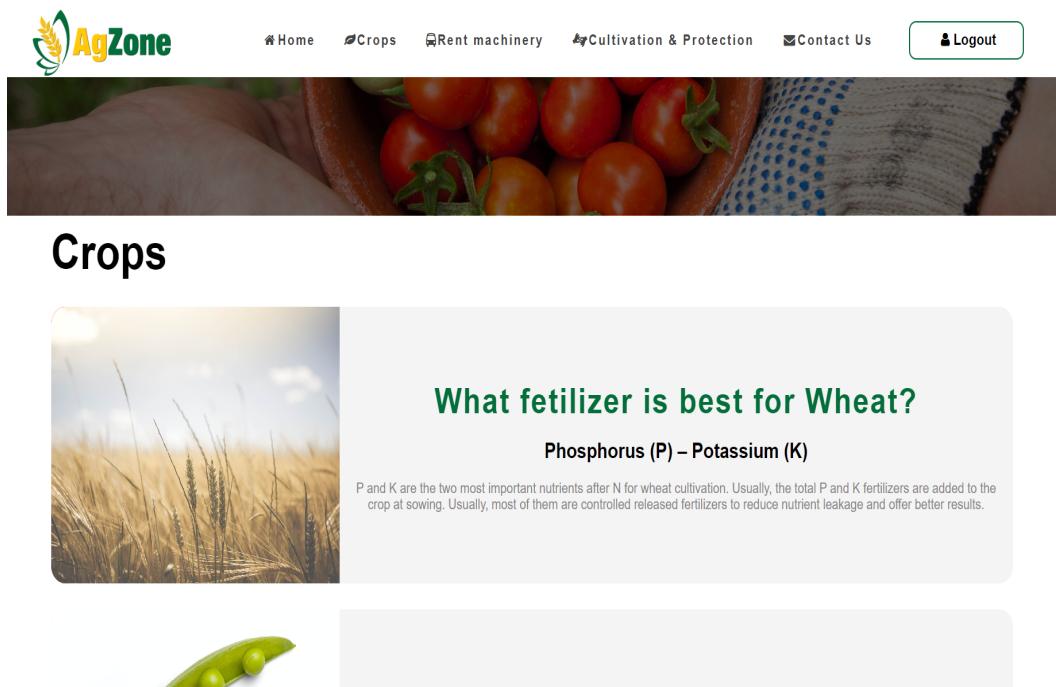


Figure 4.7: Agzone Login for booking

This code snippet appears to be for a "FIELD OF FUTURE" project, likely built with Hyper Text Markup Language(HTML),Cascading Style Sheets(CSS), and JavaScript. It has a basic structure with a form for entering exchange rates and scheduling trades. Users can specify the "From owner" , " to renter". Clicking the "booking button " button presumably triggers functionality handled by the "script.js" file, though the specific logic for onwer personal details isn't visible in this snippet.Overall, it seems like a basic framework for a rental seriveces tool with scheduling capabilities, but the core functionality would likely reside in the JavaScript or server-side code.

4.4.2 Field of future



The screenshot shows the AgZone website's homepage. At the top, there is a navigation bar with links for Home, Crops, Rent machinery, Cultivation & Protection, Contact Us, and Logout. Below the navigation bar is a large banner image featuring a hand holding a bunch of red cherry tomatoes. Underneath the banner, the word "Crops" is displayed in a large, bold, black font. To the left of the main content area is a smaller image of a wheat field. To the right of the main content area is a box containing the text "What fertilizer is best for Wheat? Phosphorus (P) – Potassium (K)". Below this text is a small note: "P and K are the two most important nutrients after N for wheat cultivation. Usually, the total P and K fertilizers are added to the crop at sowing. Usually, most of them are controlled released fertilizers to reduce nutrient leakage and offer better results." A green pea icon is positioned below the main content area.

Figure 4.8: Field of future

The provided CSS code snippet appears to style a webpage for a "Agzone" project. It establishes a basic layout with a consistent sans-serif font, removes unnecessary margins, and sets a maximum width for the main content area. For the form itself, the CSS adds padding for visual separation, displays labels clearly above input fields, and applies uniform styles to inputs, selects, and textareas. Buttons are styled with a distinct black background, white text, and no border. To enhance readability and organization, the CSS removes top margins from headers, adds spacing between groups of input fields, and centers and pads the text in the footer. Overall, the CSS prioritizes a clean, consistent, and user-friendly layout for the currency swapper and scheduler tool.

4.4.3 Booking services

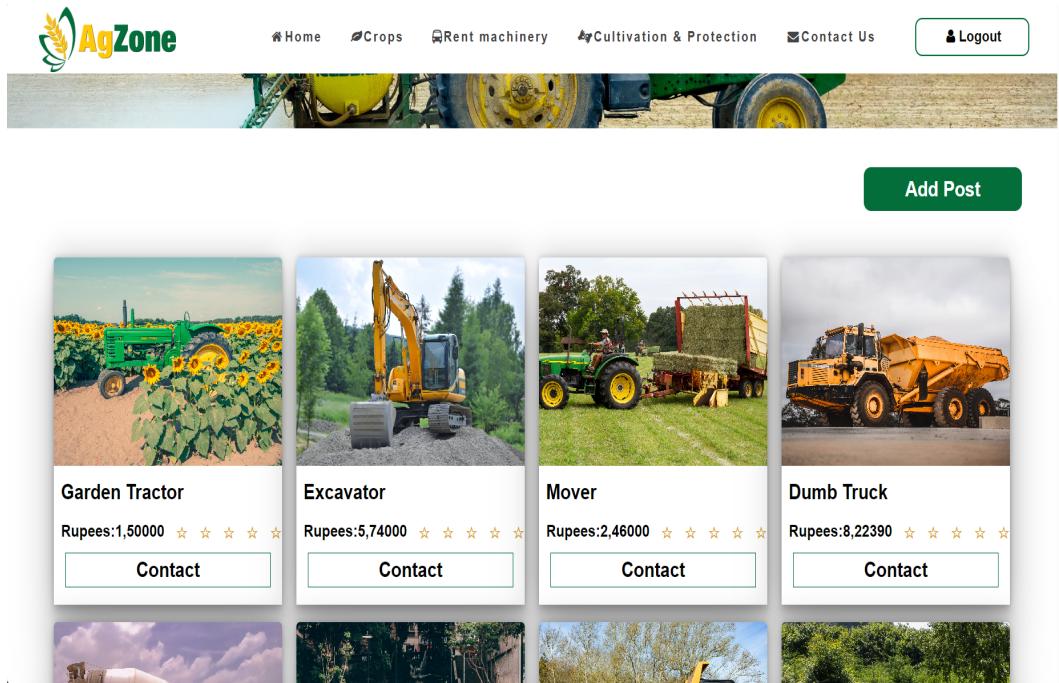


Figure 4.9: Booking services

The JavaScript code in the image appears to handle form submission and communication with the server. When the user clicks "book slot" button, the code prevents the browser's default form submission process and gathers all the user-entered information from the form fields. The code then sends this data to server's "/submit-form" endpoint via a POST request. The server responds with a success or error message, which the code then displays to the user. Overall, the JavaScript code provides a basic framework for handling form submissions and communicating with a server.

4.5 Steps to execute/run/implement the project

4.5.1 Webpage Overview and Structure Description

- 1.The HTML document defines a webpage with a header, main content, and footer sections.
- 2.External styles are linked through the "style.css" file, providing a separate file for styling rules.
3. The header includes the application name in an "h1" element.
- 4.The main content area contains two forms:Facilitating vehicle owners to rent out their vehicles to farmers.
- 5.Project features a webpage facilitating farmer-vehicle owner interaction for efficient vehicle rental services, streamlining the process of connecting farmers with available vehicles.
- 6.The renting scheduling form includes input fields for trade amount, date, and time.
- 7.A "booking slot" button inside the trade scheduling form triggers the submission.
- 8.The footer displays copyright information.
- 9.External JavaScript functionality is linked through the "script.js" file at the end of the body.

4.5.2 CSS Styling Enhancements for Webpage Elements

1. Sets font family and removes default margin for the entire document body.
- 2.Centers text in the header and adds padding.
- 3.Limits the maximum width of the main content and centers it horizontally.
4. Adds padding to the form container and a margin-bottom to each form.
- 5.Removes top margin for "h2" elements.
- 6.Provides vertical spacing between form elements with a margin-bottom for input groups and labels.
- 7.Styles input, select, and text area elements for consistent appearance.
8. Styles the button for a clean and interactive look.
- 9.Centers text in the footer and adds padding.

4.5.3 Handling Form Submission and Server Communication in JavaScript

1. Retrieves the form element from the HTML and assigns it to the variable form.
2. Adds a submit event listener to the form, preventing the default form submission behavior.
3. Creates a new Form data object named form data to collect form data.
4. Sends a POST request to the server endpoint '/submit-form' with the form data using the fetch API.
5. Parses the server response as JavaScript Object Notation(JSON).
6. Handles the server response, displaying a success or error message based on the 'success' property in the data object.

Chapter 5

IMPLEMENTATION AND TESTING

5.1 Input and Output

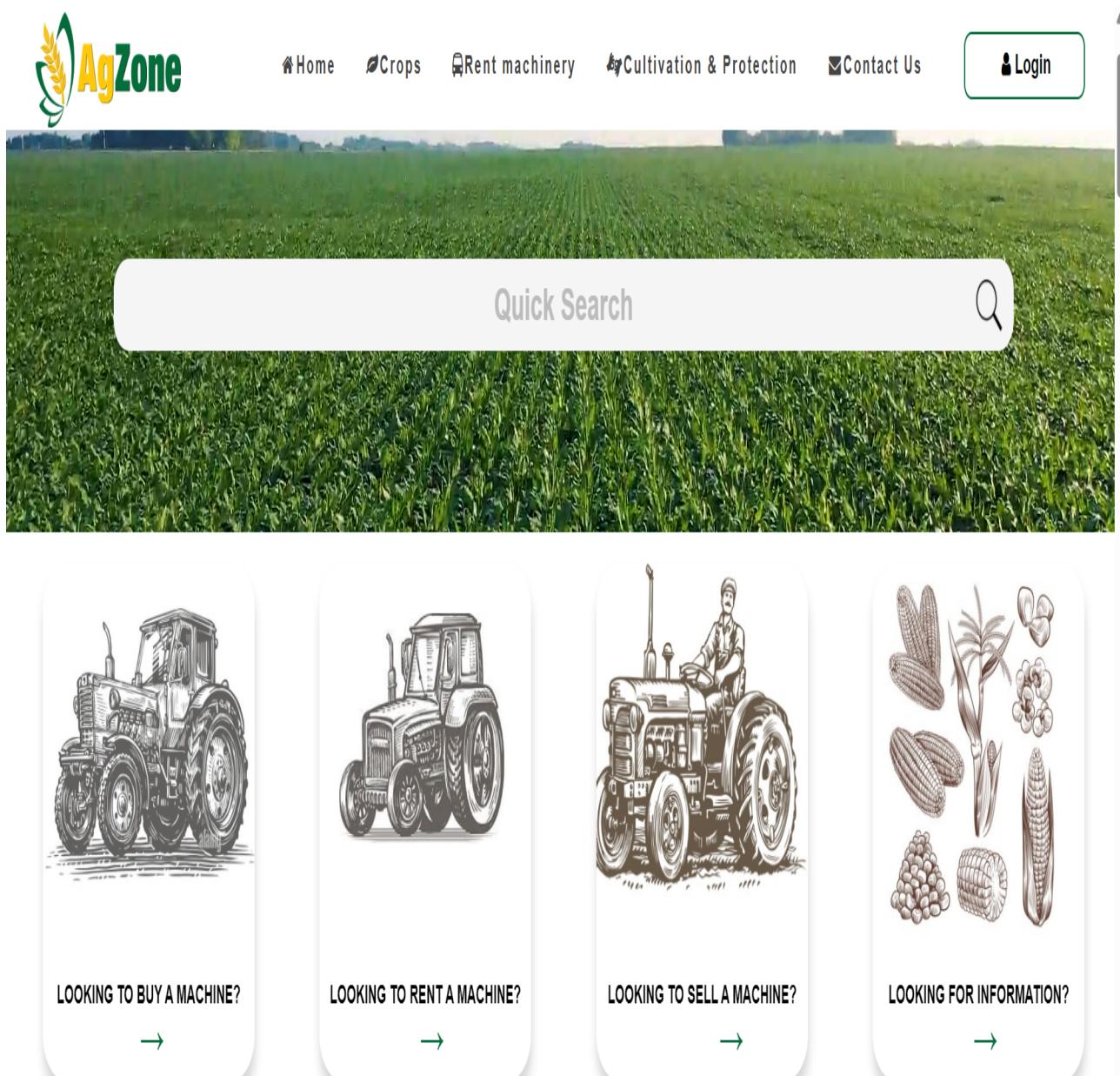


Figure 5.1: **Input and Output**

5.2 Testing

1. Unit Testing for JavaScript (script.js): Test the form submission event listener to ensure it prevents default behavior. Test the Fetch API call by mocking responses and checking if it handles success and error scenarios appropriately. Mock server responses to simulate different scenarios and check how the client-side code responds.

2. Integration Testing for Front-end and Back-end Interaction: Ensure the client can successfully communicate with the server. Validate that form data is sent correctly in the Fetch API request. Simulate different server responses to verify the client handles them appropriately.

3. Functional Testing for HTML and User Interface(UI) (index.html): Check that HTML elements (e.g., form fields, buttons) are rendered correctly. Validate user interactions, such as filling out the form and submitting it. Ensure the alerts are displayed correctly based on server responses.

4. Server-side Testing for Node.js (server.js): Write unit tests for individual server-side functions (e.g., validation, data processing). Use testing libraries (e.g., Mocha, Chai) to automate the testing process. Test the server's ability to handle different types of requests (GET, POST).

5. End-to-End Testing: Use testing frameworks (e.g., Selenium, Puppeteer) to simulate user interactions from form submission to server response. Test the entire flow, from entering data in the form to receiving a success or error message.

6. Database Testing: If applicable, write tests for the database interactions (e.g., inserting trades). Verify that the database connection is established and closed correctly. Test various scenarios to ensure proper data storage and retrieval.

7. Security Testing: Check for proper input validation on both client and server sides. Test against common security vulnerabilities, such as Structured Query Language(SQL) injection and Cross-Site Scripting (XSS). Ensure secure communication between the client and server (HTTPS).

8. Performance Testing: Simulate a high volume of form submissions to test server response times. Evaluate how the system handles concurrent requests. Identify and address any performance bottlenecks.

9. Accessibility Testing: Use accessibility testing tools to check for HTML and CSS compliance. Verify that form elements have appropriate labels and Accessible Rich Internet Application(ARIA) attributes. Test the application with screen readers and other assistive technologies.

5.3 Types of Testing

5.3.1 Unit Testing

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <link rel="stylesheet" href="style.css">
8   <script defer src="script.js"></script>
9   <script defer src="search_bar.js"></script>
10  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
11    awesome.min.css">
12  <title>AgZone-Home</title>
13 </head>
14 <body>
15   <div class="home">
16     <div class="nav-bar">
17       <div class="left-side">
18         <div class="logo">
19           
20         </div>
21       </div>
22       <div class="right-side">
23         <ul id="nav-links">
24           <li><a href="index.html"><i class="fa fa-fw fa-home"></i>Home</a></li>
25           <li><a href="fertilizers.html"><i class="fa fa-leaf" aria-hidden="true"></i>
26             Crops</a>
27           <li><a href="rent_machine.html"><i class="fa fa-bus" aria-hidden="true"></i>
28             Rent machinery</a></li>
29           <li><a href="cultivation.html"><i class="fa fa-asl-interpreting"></i>
30             Cultivation & Protection</a></li>
31           <li><a href="contactUs.html"><i class="fa fa-fw fa-envelope"></i>Contact Us
32             </a></li>
33         </ul>
34       </div>
35       <a href="#"><button id="login"><i class="fa fa-fw fa-user"></i>Login</button></a>
36     <button class="right-bar">
37       <span class="bar"></span>
38     </button>
39   </div>
40   <div class="mobile_nav">
41     <ul id="mobile_nav_links">
42       <li><a href="index.html"><i class="fa fa-fw fa-home"></i>Home</a></li>
43       <li><a href="fertilizers.html"><i class="fa fa-leaf" aria-hidden="true"></i>Crops</a>
44     </ul>
45   </div>
```

```

39         <li><a href="rent_machine.html"><i class="fa fa-bus" aria-hidden="true"></i>Rent
40             machinery </a></li>
41         <li><a href="cultivation.html"><i class="fa fa-asl-interpreting"></i>Cultivation
42             & Protection </a></li>
43         <li><a href="contactUs.html"><i class="fa fa-fw fa-envelope"></i>Contact Us</a
44             ></li>
45     </ul>
46     <a href="login.html"><button id="mobile_login"><i class="fa fa-fw fa-user"></i>Login </
47         button></a>
48     <div class="mobile_footer">
49         <p>Copyright&copy; 2022 AgZone. All Rights Reserved</p>
50     </div>
51     </div>
52     <div class="hero-image">
53         <video autoplay muted loop>
54             <source src="Banner Video.mp4" type="video/mp4">
55         </video>
56     </div>
57     <div class="search_bar">
58         <div class="search_img">
59             
60         </div>
61         <input type="text" placeholder="Quick Search" id="quick_search">
62     </div>
63     </div>
64     <div class="sub-home">
65         <div class="looking-for">
66             <div class="card">
67                 <div class="img">
68                     
69                 </div>
70                 <div class="description">
71                     <p>looking to buy a machine? <span>&ampnbsp&rarr;</span></p>
72                 </div>
73             </div>
74             <div class="card">
75                 <div class="img">
76                     
77                 </div>
78                 <div class="description">
79                     <p>looking to rent a machine?<span>&ampnbsp &rarr;</span></p>
80                 </div>
81             </div>
82             <div class="card">
83                 <div class="img">
84                     
85                 </div>
86                 <div class="description">
87                     <p>looking to sell a machine?<span id="arrow">&ampnbsp &rarr;</span></p>
88                 </div>
89             </div>
90         </div>
91     </div>
92 
```

```
85 </div>
86 
87 <div class="card">
88     <div class="img">
89         
90     </div>
91     <div class="description">
92         <p>looking for information?<span>&ampnbsp &rarr;</span></p>
93     </div>
94 </div>
95 
96 <div class="sub-hero-image" id="sub-hero-image">
97 </div>
98 <div class="about-agzone">
99     <div class="about">
100         <div class="image">
101             <p id="inc">About AgZone, Inc.</p>
102             
103         </div>
104         <div class="about-para">
105             <p>
106                 At <span>AgZone</span>, based in Kandy, we offer expert advice with a wide
107                 variety of specialist products. We are fortunate to be able to offer our
108                 clients the opportunity to test drive machines at our farm which allows you
109                 to make
110                 a fully informed choice. We have great people all over the country working
111                 towards producing the worlds finest products, and we're always on the
112                 lookout for great talent.
113             </p>
114         </div>
115     </div>
116 </div>
117 <section class="services">
118     <div class="heading">
119         <p>Our Services </p>
120     </div>
121     <div class="service-image">
122     </div>
123 <section class="our-partners">
124     <h3>— Our Partners </h3>
125     <div class="partners-sub-heading">
126         <h1>We Partner With Highly Professionals </h1>
127     </div>
128     <div class="partners">
129         <div class="img1" id="partners-img">
130             
131         </div>
132         <div class="img2" id="partners-img">
133             
134         </div>
```

```

130     <div class="img3" id="partners-img">
131         
132     </div>
133     <div class="img4" id="partners-img">
134         
135     </div>
136 </div>
137 </section>
138 <section class="what-they-say">
139     <h1>What Our Customer says about us</h1>
140     <div class="div">
141         <div class="what-they-say-image">
142             
143         </div>
144         <div class="reviews">
145             <section class="footer">
146                 <div class="left-side-footer">
147                     <p>&copy;2022 All Rights Reserved .AgZone.</p>
148                 </div>
149                 <div class="right-side-footer">
150                     <p>Web Design and Development by<a href="index.html">AgZone Team</a></p>
151                 </div>
152             </section>
153         </div>
154     </body>
155 </html>

```

Result:

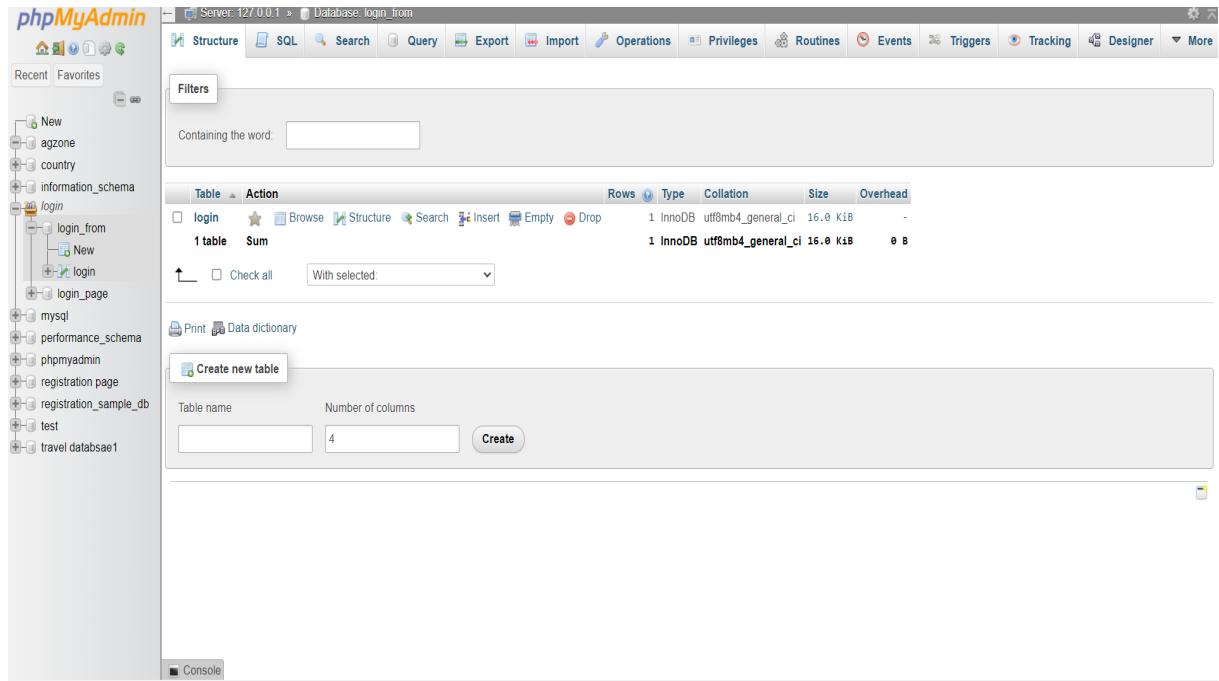


Figure 5.2: test case

5.3.2 Integration Testing

```
1  Js minor.js minor.js \...
2 // Get the form element
3 const form = document.querySelector ('form');
4 // Add a submit event listener to the form
5 form.addEventListener ('submit', function (event) {
6 // Prevent the default form submission behavior
7 event.preventDefault();
8 // Get the form data
9 const formata = new FormData (form);
10 // Send the form data to the server
11 fetch ('/submit-form', { method: 'POST', body: formData ,
12 })
13     then (response => response.json ( ))
14 . then (data => {
15 // Handle the server response
16 if (data.success) {
17 // Success message
18 alert ('Your book has been successfully !');
19 } else {
20 // Error message
21 alert ('There was an triple booking : ' + data.error);
22 }
23 });
24 }) ;
```

Result:

```
describe("Verify user's book when login is success", () => {
  it("should return success if user's membership is basic with the expected book", async () => {
    const success = login(email, password);

    if (success) {
      const userAcct = getUserAccount(email);
      const membership = getBookCategoryByType(userAcct.membership);
      const book = getBooksByCategory(membership.category);

      expect(book).toEqual("Toy Story");
    }
  });

  it("should return success if user's membership is premium with the expected book", async () => {
    const success = login(email, password);

    if (success) {
      const userAcct = getUserAccount(email);
      const membership = getBookCategoryByType(userAcct.membership);
      const book = getBooksByCategory(membership.category);

      expect(book).toEqual("Harry Potter");
    }
  });
});
```

Figure 5.3: **Integration Testing**

5.3.3 System Testing

```
1 const express = require('express');
2 const app = express();
3 const bodyParser = require('body-parser');
4 app.use(bodyParser.json());
5 app.post('/submit-form', async (req, res) => {
6   const formData = req.body;
7   const fromCurrency = formData.fromCurrency;
8   const toCurrency = formData.toCurrency;
9   const exchangeRate = formData.exchangeRate;
10  const tradeAmount = formData.tradeAmount;
11  const tradeDate = formData.tradeDate;
12  const tradeTime = formData.tradeTime;
13  try {
14    // Validate the form data
15    const trade = {
16      fromrental,
17      torental,
18      buy or rental,
19      paymentAmount,
20      rentalDate,
21      rentalTime,
22      // ... other fields
23    };
24    const result = await db.insertdetails(booking);
25    res.json({ success: true, result });
}
```

Result:

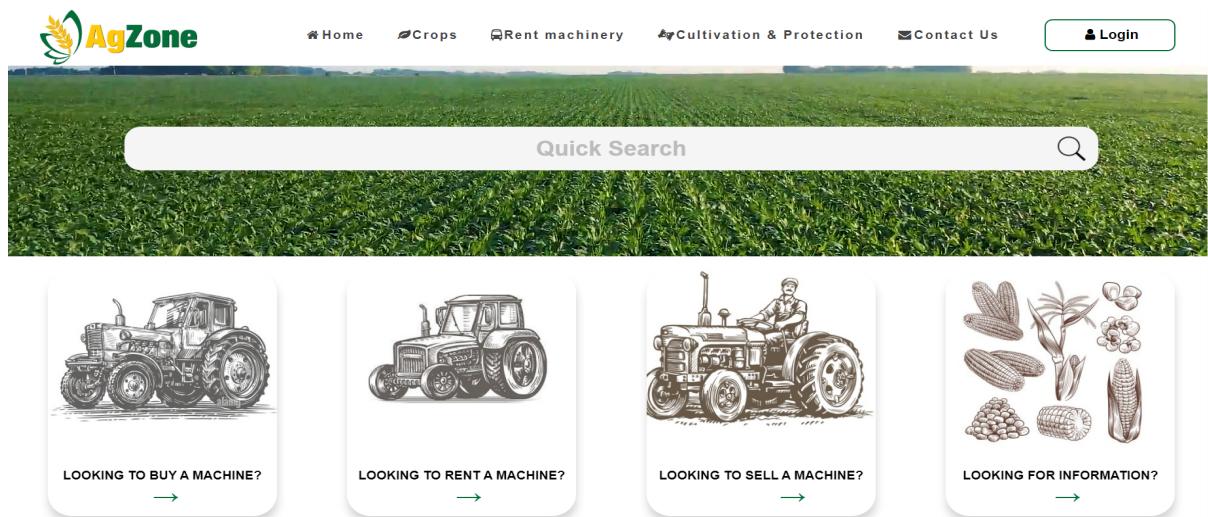


Figure 5.4: system testing

5.3.4 Test Result

The screenshot shows the homepage of the AgZone website. At the top left is the AgZone logo, which includes a stylized green and yellow leaf icon. The top navigation bar contains links for Home, Crops, Rent machinery, Cultivation & Protection, Contact Us, and a Login button. Below the navigation is a large background image of a lush green field. Overlaid on the field is a white search bar with the placeholder text "Quick Search" and a magnifying glass icon. The main content area features four white callout boxes arranged horizontally. From left to right: 1) An illustration of a tractor with the text "LOOKING TO BUY A MACHINE?" and a green arrow pointing right. 2) An illustration of a tractor with the text "LOOKING TO RENT A MACHINE?" and a green arrow pointing right. 3) An illustration of a tractor with a person driving it, labeled "LOOKING TO SELL A MACHINE?", followed by a green arrow pointing right. 4) Illustrations of various crops (corn, beans, etc.) with the text "LOOKING FOR INFORMATION?" and a green arrow pointing right.

Figure 5.5: Test Result

Chapter 6

RESULTS AND DISCUSSIONS

6.1 Efficiency of the Proposed System

The envisioned agriculture-centric platform boasts an efficient system designed to cater to the varied needs of farmers, streamlining agricultural processes seamlessly. Illustrated through comprehensive class and activity diagrams, the system ensures a logical and organized flow of operations. Intuitive interfaces for tasks such as vehicle scheduling, owner-farmer transactions, and user authentication enhance the overall user experience. Robust security measures, error-handling mechanisms, and a well-integrated password recovery feature bolster the system's reliability and user trust. Future-proofing is inherent in the incorporation of state-of-the-art technologies like AI and blockchain, positioning the platform at the forefront of agricultural innovation. The system's scalability enables effortless integration of novel features, ensuring adaptability to the evolving landscape of agricultural practices. In essence, the proposed system provides a sturdy foundation for efficient farmer services, user interactions, and readiness for future advancements, as outlined in the accompanying references.

6.2 Comparison of Existing and Proposed System

Existing system: The current agricultural landscape grapples with inefficiencies characterized by cumbersome processes, restricted accessibility, and intricate user interfaces. Conventional farming practices may impose considerable logistical challenges, impeding the prosperity of individual farmers and small agricultural enterprises. Moreover, outdated methods might lack intuitive interfaces, resulting in a less-than-optimal user experience. The prevailing systems in agriculture encounter difficulties in aligning with emerging technological paradigms, like blockchain and AI, constraining their ability to offer innovative and secure agricultural services.

Proposed system: On the contrary, our proposed agricultural system confronts the

limitations of traditional farming approaches by introducing farmer-centric features, streamlined processes, and cutting-edge technologies. The platform prioritizes cost-effective solutions, as evidenced in the vehicle rental services, with the goal of minimizing operational expenses for farmers. The incorporation of AI and blockchain as potential future enhancements underscores a dedication to staying abreast of technological advancements, ensuring the security and transparency of agricultural transactions. The user-friendly interfaces of our proposed system, coupled with efficient vehicle scheduling functionalities and multilingual support, enhance the overall farming experience, promoting accessibility and inclusivity. In essence, our proposed system represents a notable leap forward, providing a more efficient, secure, and farmer-centric agricultural service compared to existing approaches.

6.3 Sample Code

```

1 <?php
2 include_once('dbconnection.php');
3 $name = $_SESSION['Pass'];
4 ?>
5 <!DOCTYPE html>
6 <html lang="en">
7 <head>
8   <meta charset="UTF-8">
9   <meta http-equiv="X-UA-Compatible" content="IE=edge">
10  <meta name="viewport" content="width=device-width, initial-scale=1.0">
11  <link rel="stylesheet" href="style.css">
12  <script defer src="script.js"></script>
13  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
14    awesome.min.css">
15  <title>AgZone-Home</title>
16 </head>
17 <body>
18 <div class="home">
19   <div class="nav-bar">
20     <div class="left-side">
21       <div class="logo">
22         
23       </div>
24     </div>
25     <div class="right-side">
26       <ul id="nav-links">
27         <li><a href="index.php"><i class="fa fa-fw fa-home"></i>Home</a></li>
28         <li><a href="fertilizers.php"><i class="fa fa-leaf" aria-hidden="true"></i>Crops</a>
```

```

28         <li><a href="rent_machine.php"><i class="fa fa-bus" aria-hidden="true"></i>Rent
29             machinery </a></li >
30         <li><a href="cultivation.php"><i class="fa fa-asl-interpreting"></i>Cultivation &
31             ; Protection </a></li >
32         <li><a href="contactUs.php"><i class="fa fa-fw fa-envelope"></i>Contact Us</a></li >
33     </ul>
34   </div>
35   <a href="logout.php"><button id="login"><i class="fa fa-fw fa-user"></i>Logout </button></a><
36       br>
37   <button class="right-bar">
38     <span class="bar"></span>
39   </button>
40 </div>
41 <div class="mobile_nav">
42   <ul id="mobile_nav_links">
43     <li><a href="index.php"><i class="fa fa-fw fa-home"></i>Home </a></li >
44     <li><a href="fertilizers.php"><i class="fa fa-leaf" aria-hidden="true"></i>Crops
45         </a>
46     <li><a href="rent_machine.php"><i class="fa fa-bus" aria-hidden="true"></i>Rent
47         machinery </a></li >
48     <li><a href="cultivation.php"><i class="fa fa-asl-interpreting"></i>Cultivation
49         & Protection </a></li >
50     <li><a href="contactUs.php"><i class="fa fa-fw fa-envelope"></i>Contact Us</a></
51         li >
52   </ul>
53   <a href="logout.php"><button id="mobile_login"><i class="fa fa-fw fa-user"></i>Logout </
54       button></a>
55   <div class="mobile_footer">
56     <p>Copyright&copy; 2022 AgZone. All Rights Reserved </p>
57   </div>
58 </div>
59 <div class="hero-image">
60   <video autoplay muted loop>
61     <source src="Video/Banner_Video.mp4" type="video/mp4">
62   </video>
63 </div><div class="hero-image">
64   <video autoplay muted loop>
65     <source src="Video/Banner_Video.mp4" type="video/mp4">
66   </video>
67 </div>
68 <div class="search_bar">
69   <div class="search_img">

```

```

70 <div class="card">
71   <div class="img">
72     
73   </div>
74   <div class="description">
75     <p>looking to buy a machine? <span>&ampnbsp&rarr;</span></p>
76   </div>
77 </div>
78 <div class="card">
79   <div class="img">
80     
81   </div>
82
83   <div class="description">
84     <p>looking to rent a machine?<span>&ampnbsp &rarr;</span></p>
85   </div>
86 </div>
87 <div class="card">
88   <div class="img">
89     
90   </div>
91   <div class="description">
92     <p>looking to sell a machine?<span id="arrow">&ampnbsp &rarr;</span></p>
93   </div>
94 </div>
95 <div class="card">
96   <div class="img">
97     
98   </div>
99   <div class="description">
100    <p>looking for information?<span>&ampnbsp &rarr;</span></p>
101   </div>
102 </div>
103 </div>
104 </div>
105 <div class="sub-hero-image" id="sub-hero-image">
106 </div>
107 <div class="about-agzone">
108   <div class="about">
109     <div class="image">
110       <section class="what-they-say">
111         <h1>What Our Customer says about us</h1>
112         <div class="div">
113           <div class="what-they-say-image">
114             
115           </div>
116           <div class="reviews">
117             <div class="review active">
118               <p>"Lorem ipsum dolor sit amet, consectetur adipisicing elit. Vero corrupti,!"</p>
119             <div class="img-review">

```

```

120    <div class="user-profile1">
121        </div>
122        <h3>Hizbulah Razik</h3>
123    </div>
124    <div class="review-rating">
125        <div class="star-div">&#9733;</div>
126        <div class="star-div">&#9733;</div>
127        <div class="star-div">&#9733;</div>
128        <div class="star-div">&#9733;</div>
129        <div class="star-div-none">&#9734;</div>
130        <span id="review1-rating">4/5</span>
131    </div>
132 </div>
133 <div class="review">
134     <p>"Lorem ipsum dolor sit amet, consectetur adipisicing elit. Vero corrupti ,!"</p>
135     <div class="img-review">
136         <div class="user-profile2">
137             </div>
138             <h3>Janrthan Manojkumar</h3>
139         </div>
140         <div class="review-rating">
141             <div class="star-div">&#9733;</div>
142             <div class="star-div">&#9733;</div>
143             <div class="star-div">&#9733;</div>
144             <div class="star-div-none">&#9734;</div>
145             <div class="star-div-none">&#9734;</div>
146             <span id="review1-rating">3/5</span>
147         </div>
148     </div>
149     <div class="review">
150         <p>"Lorem ipsum dolor sit amet, consectetur adipisicing elit. Vero corrupti ,!"</p>
151         <div class="img-review">
152             <div class="user-profile3">
153                 </div>
154                 <h3>Meshith Ariyanawansa</h3>
155             </div>
156             <div class="review-rating">
157                 <div class="star-div">&#9733;</div>
158                 <div class="star-div">&#9733;</div>
159                 <div class="star-div">&#9733;</div>
160                 <div class="star-div">&#9733;</div>
161                 <div class="star-div-none">&#9734;</div>
162                 <span id="review1-rating">4/5</span>
163             </div>
164         </div>
165         <div class="review">
166             <p>"Lorem ipsum dolor sit amet, consectetur adipisicing elit. Vero corrupti ,!"</p>
167             <div class="img-review">
168                 <div class="user-profile4">
169                     </div>

```

```

170         <h3>Jayasinghe </h3>
171     </div>
172     <div class="review-rating">
173         <div class="star-div">&#9733;</div>
174         <div class="star-div">&#9733;</div>
175         <div class="star-div">&#9733;</div>
176         <div class="star-div">&#9733;</div>
177         <div class="star-div">&#9733;</div>
178         <span id="review1-rating">5/5</span>
179     </div>
180   </div>
181   <div class="review">
182     <p>"Lorem ipsum dolor sit amet consectetur adipisicing elit.
183         Facere placeat laudantium facilis ullam iure numquam quidem
184         amet doloremque, maiores, ad modi veritatis ea aliquam nisi pariatur,
185         architecto voluptas omnis labore."</p>
186     <div class="review-rating">
187         <div class="star-div">&#9733;</div>
188         <div class="star-div">&#9733;</div>
189         <div class="star-div">&#9733;</div>
190         <div class="star-div">&#9733;</div>
191         <div class="star-div-none">&#9734;</div>
192         <span id="review1-rating">4/5</span>
193     </div>
194   </div>
195 </div>
196 </section>
197 <section class="footer">
198   <div class="left-side-footer">
199     <p>&copy;2022 All Rights Reserved. AgZone.</p>
200   </div>
201   <div class="right-side-footer">
202     <p>Web Design and Development by<a href="#">AgZone Team</a></p>
203   </div>
204 </section>
205 </body>
206 </html>
207
208 const result = await db.insertSolt(book);
209 res.json({ success: true, rent: result });

```

Output

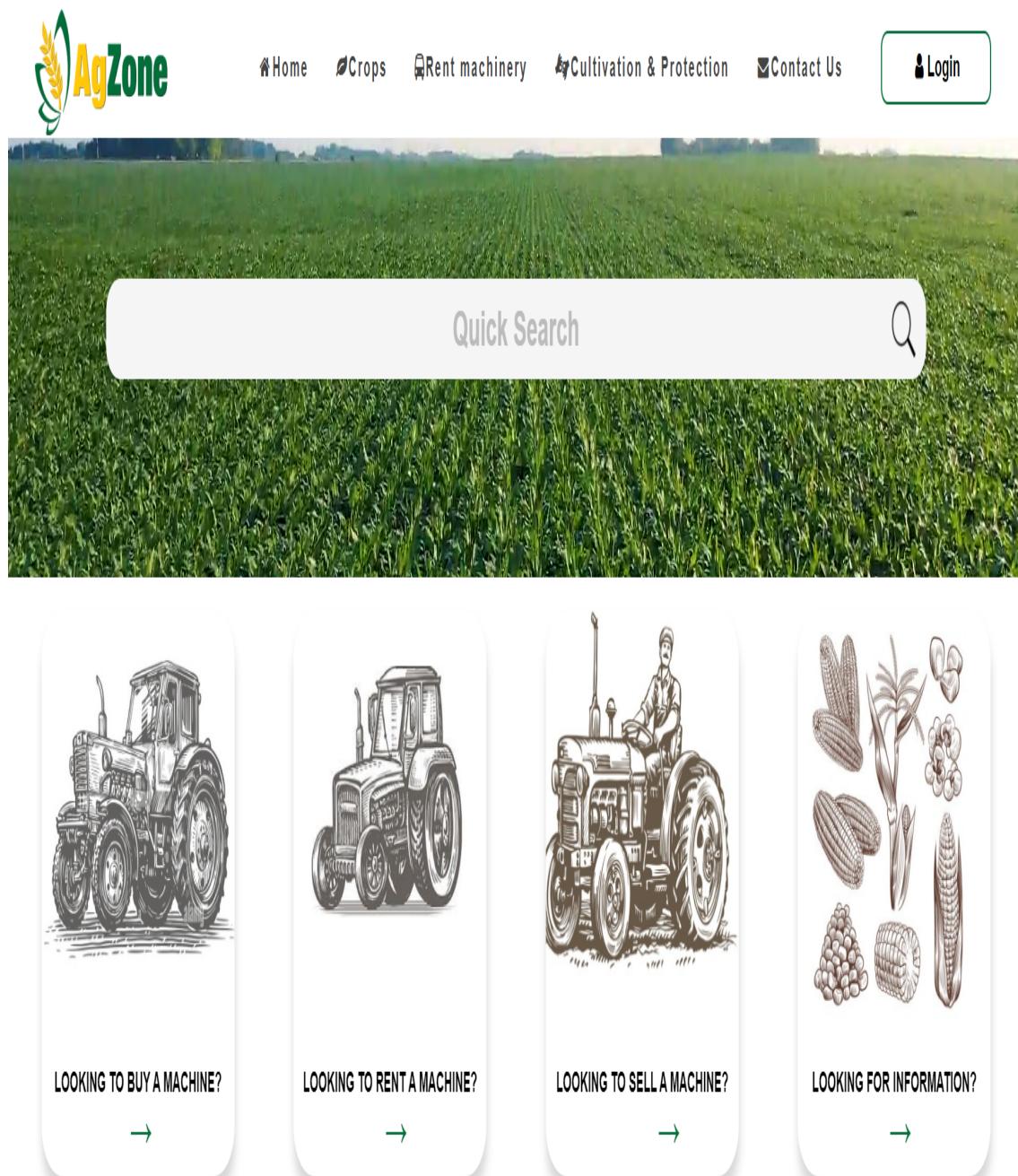


Figure 6.1: Result

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Conclusion

In conclusion, the envisioned financial platform, with its comprehensive features such as , appointment booking, and user-friendly interfaces, demonstrates a robust foundation for addressing the evolving needs of users in the financial sector. The project aims to streamline rental services , mitigate risks, and optimize financial transactions for a diverse user base, including individuals, businesses, and investors. The inclusion of user-centric functionalities, error handling, and advanced security measures aligns with the goal of providing a secure and seamless financial experience . To further enhance the platform, future considerations could include the integration of advanced technologies like Artificial Intelligence(AI), Machine Learning(ML), and blockchain, as well as expanding rental services offerings to include cryptocurrencies. Continuous improvement, user feedback incorporation, and adaptability to technological advancements will be pivotal for ensuring the long-term success and relevance of the financial platform in the dynamic FinTech landscape.

The envisioned financial platform represents a significant advancement in the Fin-Tech sector, offering a wide array of features designed to meet the diverse needs of users. Beyond conventional rental services, the platform's appointment booking functionality streamlines access to financial resources, ensuring timely and efficient service delivery. Moreover, the emphasis on user-friendly interfaces enhances accessibility for individuals, businesses, and investors alike, fostering a seamless and intuitive user experience.

By integrating user-centric functionalities and advanced security measures, the platform prioritizes the safety and satisfaction of its users. Error handling mechanisms are implemented to minimize disruptions and ensure smooth transaction pro-

cesses, instilling confidence in users and building trust in the platform's reliability. Additionally, the inclusion of robust security protocols safeguards sensitive financial data, mitigating the risks associated with online transactions and enhancing overall cybersecurity posture.

Looking ahead, the platform's future enhancements could leverage cutting-edge technologies such as Artificial Intelligence (AI), Machine Learning (ML), and blockchain to further elevate its capabilities. AI and ML algorithms can analyze user behavior patterns, enabling personalized financial recommendations and tailored services that meet individual preferences and objectives. Furthermore, blockchain technology offers unparalleled transparency and security in financial transactions, facilitating immutable records and reducing the risk of fraud or manipulation.

Expanding the platform's rental services offerings to include cryptocurrencies represents a strategic move to capitalize on the growing popularity of digital assets and decentralized finance (DeFi). By enabling users to access and transact with cryptocurrencies, the platform not only diversifies its product offerings but also taps into a burgeoning market segment, attracting a broader user base and enhancing its competitive position in the FinTech landscape.

In conclusion, the envisioned financial platform is poised to redefine the way financial services are accessed and utilized, offering a comprehensive suite of features that cater to the evolving needs of users. Continuous improvement, guided by user feedback and technological advancements, will be crucial for maintaining the platform's relevance and competitiveness in an ever-changing landscape. With a strong foundation built on innovation, security, and user-centric design principles, the platform is well-positioned to shape the future of finance and drive positive change in the industry.

7.2 Future Enhancements

For future enhancements, the proposed financial platform could explore the integration of advanced technologies to further enhance user experience and system efficiency. Implementing artificial intelligence (AI) and machine learning algorithms

could provide personalized recommendations to users based on their transaction history and preferences. Additionally, incorporating blockchain technology may enhance the security and transparency of financial transactions, ensuring a tamper-resistant and decentralized ledger. The platform could also expand its rental services to include a wider range of cryptocurrencies, catering to the growing interest in digital assets. Moreover, exploring partnerships with additional financial institutions or expanding the platform's offerings to include investment and savings features could contribute to a more comprehensive and versatile financial ecosystem. Lastly, continuous refinement of the user interface, incorporating user feedback, and staying abreast of evolving technologies and regulatory changes would ensure the platform remains at the forefront of the FinTech landscape, delivering optimal value to its users.

Looking towards future enhancements, the proposed financial platform holds significant potential for integrating advanced technologies to further elevate user experience and system efficiency. By leveraging artificial intelligence (AI) and machine learning algorithms, the platform can offer personalized recommendations tailored to individual users' transaction history, preferences, and financial goals. This level of customization not only enhances user satisfaction but also fosters deeper engagement and trust in the platform's capabilities.

Furthermore, the integration of blockchain technology presents an opportunity to enhance the security and transparency of financial transactions within the platform. Blockchain's inherent properties of immutability and decentralization ensure a tamper-resistant ledger, reducing the risk of fraudulent activities and enhancing overall transaction integrity. By implementing blockchain, the platform can instill greater confidence among users, further solidifying its position as a trusted and reliable financial service provider.

Chapter 8

PLAGIARISM REPORT

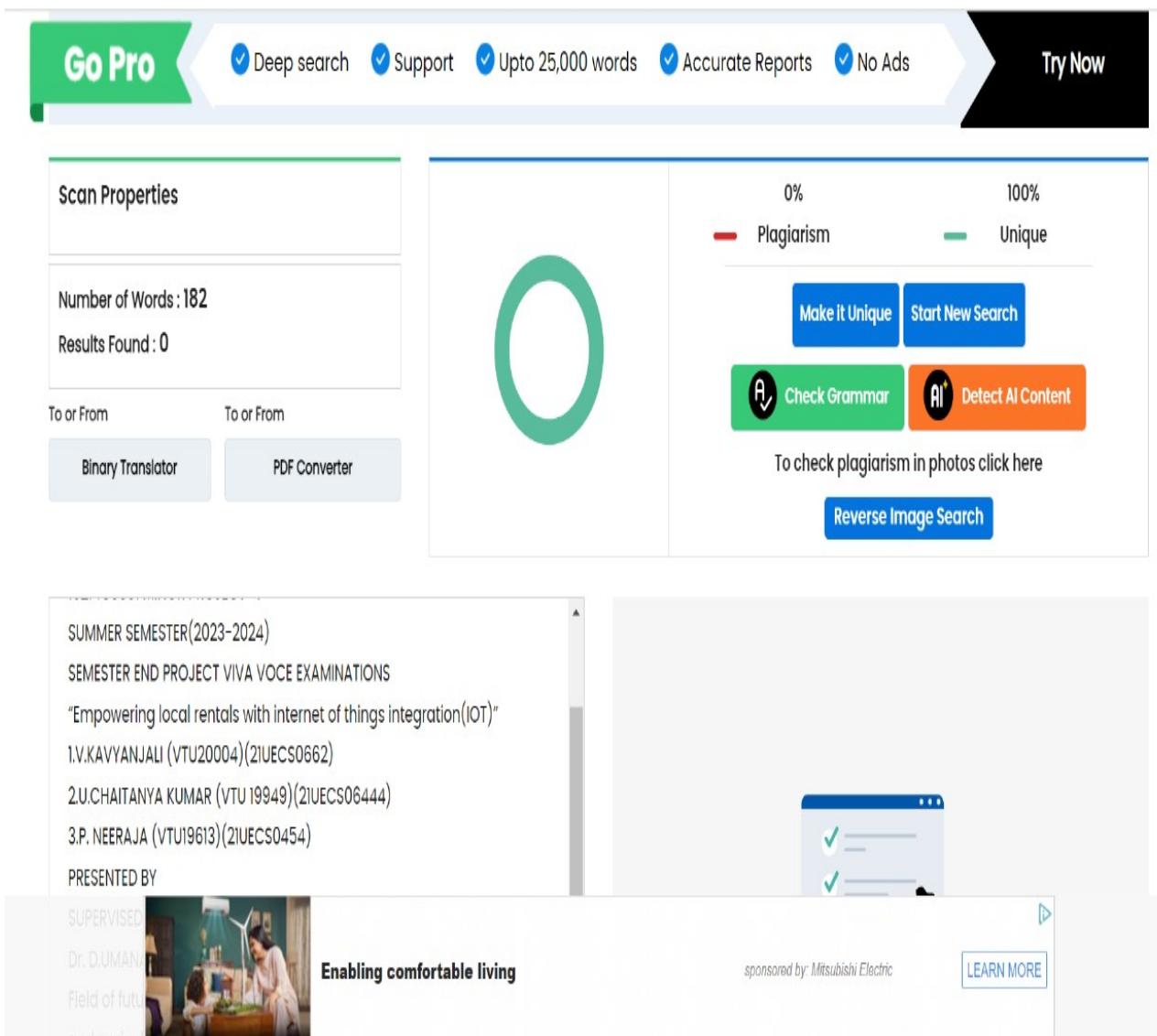


Figure 8.1: Plagiarism Report

Chapter 9

SOURCE CODE & POSTER

PRESENTATION

9.1 Source Code

```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta http-equiv="X-UA-Compatible" content="IE=edge">
6      <meta name="viewport" content="width=device-width, initial-scale=1.0">
7      <link rel="stylesheet" href="style.css">
8      <script defer src="script.js"></script>
9      <script defer src="search_bar.js"></script>
10     <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
11         awesome.min.css">
12     <title>AgZone-Home</title>
13 </head>
14 <body>
15     <div class="home">
16         <div class="nav-bar">
17             <div class="left-side">
18                 <div class="logo">
19                     
20                 </div>
21             </div>
22             <div class="right-side">
23                 <ul id="nav-links">
24                     <li><a href="index.html"><i class="fa fa-fw fa-home"></i>Home</a></li>
25                     <li><a href="fertilizers.html"><i class="fa fa-leaf" aria-hidden="true"></i>
26                         Crops </a></li>
27                     <li><a href="rent_machine.html"><i class="fa fa-bus" aria-hidden="true"></i>
28                         Rent machinery </a></li>
29                     <li><a href="cultivation.html"><i class="fa fa-asl-interpreting"></i>
                         Cultivation & Protection </a></li>
                     <li><a href="contactUs.html"><i class="fa fa-fw fa-envelope"></i>Contact Us
                         </a></li>
                 </ul>
             </div>
         </div>
```

```

30      <a href="login.html"><button id="login"><i class="fa fa-fw fa-user"></i>Login</button></
31      a>
32      <button class="right-bar">
33          <span class="bar"></span>
34      </button>
35      </div>
36      <div class="mobile_nav">
37          <ul id="mobile_nav_links">
38              <li><a href="index.html"><i class="fa fa-fw fa-home"></i>Home</a></li>
39              <li><a href="fertilizers.html"><i class="fa fa-leaf" aria-hidden="true"></i>Crops <a>
40                  >
41                  <li><a href="rent_machine.html"><i class="fa fa-bus" aria-hidden="true"></i>Rent
42                      machinery </a></li>
43                  <li><a href="cultivation.html"><i class="fa fa-asl-interpreting"></i>Cultivation
44                      & Protection </a></li>
45                  <li><a href="contactUs.html"><i class="fa fa-fw fa-envelope"></i>Contact Us</a>
46                  ></li>
47          </ul>
48          <a href="login.html"><button id="mobile_login"><i class="fa fa-fw fa-user"></i>Login</
49          button></a>
50          <div class="mobile_footer">
51              <p>Copyright&copy; 2022 AgZone. All Rights Reserved</p>
52          </div>
53      </div>
54      <div class="hero-image">
55          <video autoplay muted loop>
56              <source src="Banner Video.mp4" type="video/mp4">
57          </video>
58      </div>
59      <div class="search_bar">
60          <div class="search_img">
61              
62          </div>
63          <input type="text" placeholder="Quick Search" id="quick_search">
64      </div>
65  </div>
66  <div class="sub-home">
67      <div class="looking-for">
68          <div class="card">
69              <div class="img">
70                  
71              </div>
72              <div class="description">
73                  <p>looking to buy a machine? <span>&ampnbsp&rarr;</span></p>

```

```

74      <div class="description">
75          <p>looking to rent a machine?<span>&nbsp; &rarr;</span></p>
76      </div>
77  </div>
78  <div class="sub-hero-image" id="sub-hero-image">
79  </div>
80  <div class="about-agzone">
81      <div class="about">
82          <div class="image">
83              <p id="inc">About AgZone, Inc.</p>
84              
85          </div>
86          <div class="about-para">
87              <p>
88                  At <span>AgZone</span>, based in Kandy, we offer expert advice with a wide
89                  variety of specialist products. We are fortunate to be able to offer our
90                  clients the opportunity to test drive machines at our farm which allows you
91                  to make
92                  a fully informed choice. We have great people all over the country working
93                  towards producing the worlds finest products, and we're always on the
94                  lookout for great talent.
95              </p>
96          </div>
97      </div>
98  </div>
99  <section class="services">
100      <div class="heading">
101          <p>Our Services </p>
102      </div>
103      <div class="service-image">
104          </div>
105          <p id="para">Lorem ipsum dolor sit amet consectetur, adipisicing elit.
106              Repudiandae, voluptates vel, non eius possimus?</p>
107          <p id="more">Learn More</p>
108      </div>
109  </div>
110  </div>
111  </div>
112  </div>
113  </div>
114  </div>
115  </div>
116  </div>

```

```

117         <div class="user-profile1">
118             </div>
119             <h3>Hizbulah Razik</h3>
120             <div class="review-rating">
121                 <div class="star-div">&#9733;</div>
122                 <div class="star-div">&#9733;</div>
123                 <div class="star-div">&#9733;</div>
124                 <div class="star-div-none">&#9734;</div>
125                 <div class="star-div-none">&#9734;</div>
126                 <span id="review1-rating">3/5</span>
127             </div>
128         </div>
129         <div class="review">
130             <p>"Lorem ipsum dolor sit amet, consectetur adipisicing elit. Vero corrupti ,!"</p>
131             <div class="img-review">
132                 <div class="user-profile3">
133             <div class="review">
134                 <p>"Lorem ipsum dolor sit amet consectetur adipisicing elit. Facere placeat laudantium facilis ullam iure numquam quidem amet doloremque, maiores, ad modi veritatis ea aliquam nisi pariatur, architecto voluptas omnis labore."</p>
135             <div class="img-review">
136                 <div class="user-profile5">
137                     </div>
138                     <h3>Alex Lee</h3>
139                     </div>
140                     <div class="review-rating">
141                         <div class="star-div">&#9733;</div>
142                         <div class="star-div">&#9733;</div>
143                         <div class="star-div-none">&#9734;</div>
144                         <span id="review1-rating">4/5</span>
145                     </div>
146                 </div>
147             </div>
148         </div>
149     </section>
150     <section class="footer">
151         <div class="left-side-footer">
152             <p>&copy;2022 All Rights Reserved .AgZone.</p>
153         </div>
154         <div class="right-side-footer">
155             <p>Web Design and Development by<a href="#">AgZone Team</a></p>
156         </div>
157     </section>
158 </body>
159 </html>

```

9.2 Poster Presentation



EMPOWERING LOCAL RENTALS WITH INTERNET OF THINGS
 Department of Computer Science & Engineering
 School of Computing
 10214CS602- MINOR PROJECT-II
 WINTER SEMESTER 2023-2024

ABSTRACT

Field of future provides a unified marketplace where farmers, suppliers, and agricultural enthusiasts can connect, collaborate, and fulfill diverse needs from. Whether farmers seek to buy, sell, or rent equipment, seeds, or produce, AgZone offers a dynamic ecosystem catering to various agricultural requirements. Utilizing advanced algorithms, AgZone optimizes the allocation of farming resources, promoting efficiency, sustainability, and fair resource utilization. Beyond the transactions, field of future fosters a sense of community by digitally connecting farmers and agribusinesses, enabling collaboration and knowledge sharing. Field of future leverages cutting-edge technologies like AI and data analytics to enhance user experience, offering personalized recommendations.

INTRODUCTION

Transformative online platform catering to diverse user needs. Empowering individuals to easily rent, sell, or buy machinery. Offering a seamless and user-friendly interface for a range of users. Connecting equipment owners with those in need efficiently, through the fostering of economic opportunities for machinery owners and renters. Providing a one-stop solution for various equipment-related requirements. Prioritizing user convenience and satisfaction. Leveraging technology to simplify the machinery transaction process. Promoting sustainable practices by encouraging resource sharing. Revolutionizing the way individuals access and manage machinery.

RESULTS

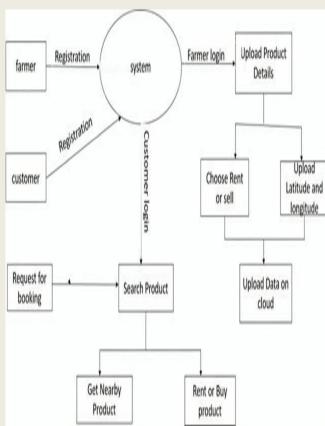
AgZone represents a groundbreaking initiative to modernize agriculture by providing a cutting-edge online platform. It not only facilitates on-demand rental of farming equipment but also encourages a collaborative ecosystem for buying, selling, and sharing resources. With AgZone, farmers gain unprecedented access to a wide array of machinery, enhancing productivity and sustainability. The project's impact extends beyond immediate farming needs, contributing to economic growth, resource conservation, and the ushering in of a technology-driven era in agriculture.

METHODOLOGIES

User Input:
Gather specific farmer requirements for agricultural equipment.
Retrieve farmer preferences for equipment type, duration, and pickup/delivery options.

Inventory Management:
Maintain an up-to-date inventory of available agricultural equipment. Categorize equipment based on type, availability, and condition.

Matching Algorithm:
Implement an algorithm to match farmer requirements with available equipment. Prioritize matches based on equipment availability, proximity, and historical user feedback.



Architecture Diagram:farmer machine rent process

```

graph TD
    Farmer[farmer] -- Registration --> System((System))
    Customer[customer] -- Registration --> System
    System -- "Customer login" --> Search[Search Product]
    Search --> GetNearby[Get Nearby Product]
    Search --> RentBuy[Rent or Buy product]
    System -- "Farmer login" --> UploadProd[Upload Product Details]
    UploadProd --> Choose[Choose Rent or sell]
    Choose --> UploadLat[Upload Latitude and longitude]
    Choose --> UploadData[Upload Data on cloud]
    UploadLat --> GetNearby
    UploadData --> RentBuy
    
```

Output



CONCLUSIONS

AgZone, farmers gain unprecedented access to a wide array of machinery, enhancing productivity and sustainability. The project's impact extends beyond immediate farming needs, contributing to economic growth, resource conservation, and the ushering in of a technology-driven era in agriculture.

ACKNOWLEDGEMENT

- Supervisor Name : Dr.D.Umanandhini / Professor
- Contact No : 9841593117
- Mail ID : drdumanandhini@veltech.edu.in

Figure 9.1: Poster Representation

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