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KhetSetGo- Empowering Farmers and Machine owners

Himanshu Kaspate, Tejas More, Atharv Sanas, Pruthviraj Sarade, Prof.Vijay Mohite
Zeal Polytechnic, Pune, India.

Abstract- Agriculture remains a primary source of livelihood in many developing regions, yet many farmers face challenges in accessing modern agricultural machinery due to high purchasing costs and limited availability. Small and medium-scale farmers often cannot afford expensive equipment such as tractors, harvesters, and other farming tools, which affects productivity and efficiency. To address this issue, this research presents KhetSetGo – Empowering Farmers and Machine Owners, a web-based platform designed to connect farmers who require agricultural machinery with machine owners willing to rent their equipment. The platform enables machine owners to post available machinery with relevant details, while farmers can easily browse, view machine information, and place booking requests according to their agricultural needs. The proposed system is developed using Java Server Pages (JSP), Servlets, MySQL database, HTML, CSS, and JavaScript, and is deployed on the Apache Tomcat server. The platform includes features such as user authentication, OTP-based password recovery, machine listing with media support, and booking management between farmers and machine owners. By enabling an online rental marketplace for agricultural equipment, the system helps reduce machinery costs for farmers while improving equipment utilization for owners. The implementation of KhetSetGo demonstrates how digital platforms can support smart farming practices and improve accessibility to agricultural resources through an efficient and user-friendly system.

Keywords – Deepfake Detection, Artificial Intelligence, Convolutional Neural Networks (CNN), Multimodal Content Analysis, AI-Generated Media Detection, Machine Learning, Cybersecurity, Digital Forensics.

I. INTRODUCTION

Agriculture is one of the most important sectors in many developing countries and plays a vital role in supporting rural live lihoods and economic growth. Modern agricultural machinery such as tractors, harvesters, seeders, and rotavators significantly improve farming efficiency and productivity. However, the high purchase and maintenance cost of these machines makes them inaccessible for many small and marginal farmers. As a result, farmers often rely on traditional farming methods or struggle to find available machinery during peak agricultural seasons, which reduces productivity and increases operational difficulties.

With the rapid advancement of digital technologies and internet connectivity, web-based platforms have emerged as effective solutions for connecting service providers with users in various industries. In the agricultural sector, digital platforms can help bridge the gap between farmers and machinery owners by enabling equipment sharing and rental services. Such platforms allow machine owners to rent out their equipment when it is not in use, while farmers can access the required machinery at an affordable cost without the need for large investments.

To address these challenges, this research proposes KhetSetGo – Empowering Farmers and Machine Owners, a web-based agricultural equipment rental platform designed to connect farmers with machine owners through an online system. The platform allows machine owners to post their agricultural equipment along with details such as machine type, images, rental price, and availability. Farmers can browse available equipment, view detailed information, and place booking requests according to their farming requirements. This system helps improve equipment utilization and provides farmers with timely access to modern agricultural tools.

The proposed system is implemented using Java Server Pages (JSP), Servlets, MySQL database, HTML, CSS, and JavaScript, and deployed on the Apache Tomcat server. The platform also includes features such as user authentication, OTP-based password recovery, machine listing with media support, and booking management between farmers and machine owners. By providing a digital marketplace for agricultural equipment rental, KhetSetGo contributes to the development of smart farming practices, promotes efficient resource sharing, and helps improve the accessibility of modern agricultural technology for farmers.

II. PROBLEM DEFINITION/RESEARCH GAP

Agriculture is a fundamental sector that supports the livelihood of a large population, particularly in developing countries. The use of modern agricultural machinery such as tractors, harvesters, seeders, and rotavators plays an important role in

improving farming efficiency, reducing manual labor, and increasing crop productivity. However, the high cost associated with purchasing, maintaining, and operating such machinery makes it difficult for many small and marginal farmers to own these resources. As a result, a large number of farmers continue to depend on traditional farming methods or limited local resources, which can lead to delays in agricultural activities and red uced overall productivity.

In many rural areas, the process of accessing or renting agricultural machinery is still carried out through informal network s, personal contacts, or local service providers. These traditional methods often lack proper coordination, transparency, and reliability. Farmers frequently face challenges in locating available machinery during critical farming seasons, while machine owners may not have an efficient way to offer their equipment for rental. Consequently, valuable agricultural resources remain underutilized, and farmers experience difficulties in obtaining the machinery required for timely farming operations.

Another important issue is the absence of a centralized and structured digital platform that can effectively connect farmers with machinery owners. Existing systems in many regions rely heavily on manual communication and do not provide features such as organized equipment listings, availability tracking, or structured booking mechanisms. This lack of technological integration makes the rental process inefficient and time-consuming for both farmers and equipment owners. Additionally, many existing platforms are not designed with simple and user- friendly interfaces, which limits accessibility for farmers who may have limited experience with digital systems.

Furthermore, the rapid growth of digital technologies and internet connectivity has created opportunities to improve agricultural services through web-based platforms. However, the adoption of such systems in the field of agricultural machinery sharing remains limited. There is a clear need for a system that can provide an accessible, reliable, and efficient solution to facilitate the sharing and utilization of agricultural equipment.

Therefore, the research gap lies in the lack of a dedicated digital platform that enables efficient interaction between farmers and machine owners while supporting equipment discovery, booking management, and resource sharing in a structured manner. To address this gap, this research proposes KhetSetGo – Empowering Farmers and Machine Owners, a web-based agricultural equipment rental platform designed to improve accessibility to farming machinery. The system aims to provide a centralized platform where machine owners can list their equipment and farmers can easily search, view, and book machines according to their requirements. By introducing such a digital solution, the proposed system seeks to improve equipment utilization, reduce operational challenges for farmers, and promote the adoption of modern agricultural practices.

Objective

The primary objective of this research is to develop KhetSetGo – Empowering Farmers and Machine Owners, a web-based platform that facilitates the efficient sharing and rental of agricultural machinery. The system aims to connect farmers who require farmin g equipment with machine owners who are willing to rent their machinery, thereby improving accessibility to modern agricultural tools and promoting efficient resource utilization in the agricultural sector.

The specific objectives of this research are:

1. To develop a web-based platform that connects farmers and agricultural machine owners through an online equipment rental system.
2. To enable machine owners to list and manage their agricultural equipment, including details such as machine type, images, rental price, and availability.
3. To allow farmers to easily browse and search for available agricultural machinery based on their farming requirements.
4. To implement an equipment booking system that allows farmers to request and manage machine rentals through the platform.
5. To design a secure and user-friendly interface that allows both farmers and machine owners to access the system efficiently.
6. To maintain and store user data, equipment listings, and booking information in a database for effective management and monitoring of the platform.

III. LITERATURE REVIEW

Several research studies have focused on addressing the challenges of agricultural mechanization by proposing digital machinery rental and equipment discovery systems. Kumar et al. (2018) proposed an Agricultural Equipment Rental System that introduced a centralized platform to provide farmers with access to expensive machinery on a rental basis. Their study emphasized cost reduction and improved agricultural productivity. However, the system lacked real-time equipment availability tracking and mobile-centric design, which limited its practical adoption in rural environments where mobile accessibility plays a crucial role.

Swarnamalya and Anbumani (2023) proposed AgroEcom: An Agricultural Equipment Rental Services for Smart Farming, which focused on a web-based system enabling equipment listing, online booking, digital payments, and rating mechanisms. The study demonstrated improved transparency and better utilization of agricultural resources. However, the proposed system had certain limitations, including lack of

mobile accessibility, absence of GPS-based machine discovery, and lack of intelligent recommendation mechanisms. These limitations may reduce usability for farmers operating in remote rural areas with limited access to advanced digital infrastructure.

Suganth and Santhi (2025) developed a Smart Farming Equipment Rental System aimed at bridging the gap between farmers and equipment owners through a digital application platform. Their system included features such as equipment search, scheduling, booking management, and user feedback mechanisms, which contribute to sustainable farming practices. Despite its structured design, the system did not address scalability issues, integration with government agricultural schemes, or the use of advanced analytics for demand forecasting and resource optimization.

Patil et al. (2022) introduced a Web-Based Smart Farming Equipment Rental System Using Web Technology that incorporated separate modules for farmers, equipment owners, and administrators. The proposed system improved transparency and reduced manual coordination between users. However, the study lacked multilingual support and offline accessibility features, which are essential for effective implementation in rural regions of India where farmers may have limited digital literacy and inconsistent internet connectivity.

Ner et al. (2023) proposed an Agricultural Equipment Rental System focusing on authentication, equipment management, and booking workflows. The system addressed the issues of affordability and accessibility of agricultural machinery for farmers. However, it did not include features such as intelligent machine matching, real-time equipment tracking, or performance evaluation mechanisms for machinery usage. Additionally, many existing studies emphasize reducing idle machine time and improving accessibility but provide limited attention to system security, trust verification, and user credibility management.

Overall, the literature indicates that while existing agricultural machinery rental systems contribute significantly toward digitizing the rental process, most solutions remain fragmented and limited in addressing rural-specific challenges. Common gaps identified across studies include the lack of real-time availability tracking, inadequate support for farmers with low digital literacy, absence of multilingual interfaces, limited trust-building mechanisms, and insufficient integration of intelligent decision-support tools. These identified limitations highlight the need for a unified, farmer-centric, and scalable machine discovery and rental platform, which forms the foundation for the development of KhetSetGo.

IV. PROPOSED WORK OVERVIEW

1. System Concept

KhetSetGo is a web-based agricultural equipment rental platform designed to connect farmers who need farming machinery with machine owners who are willing to rent out their equipment. The primary concept of the system is to create a digital marketplace where agricultural machines can be easily discovered, listed, and booked online. The platform aims to reduce the financial burden on farmers who cannot afford to purchase expensive agricultural machinery while also enabling machine owners to utilize their equipment more efficiently by renting it to others when it is not in use.

The system leverages web technologies to provide a centralized platform that simplifies the process of finding, listing, and renting agricultural equipment. By digitizing the traditional equipment rental process, the platform improves accessibility, transparency, and efficiency in agricultural operations. KhetSetGo contributes to the adoption of modern farming practices by making machinery more accessible to farmers through a structured and user-friendly online system.

2. Working Process of the System

The working process of KhetSetGo involves several steps that enable efficient interaction between farmers and machine owners through the web platform. Initially, users register and create an account on the system. After successful authentication, users can access the platform according to their respective roles.

Machine owners can upload and manage their agricultural equipment by providing details such as machine name, description, images, rental price, and availability. These listings are displayed on the platform, allowing farmers to browse and explore available machinery. Farmers can search for suitable equipment based on their farming requirements and view detailed information about each machine.

Once a farmer selects the required equipment, a booking request can be submitted through the platform. The machine owner rece ives the booking request and can review and manage the request accordingly. All equipment listings, user data, and booking information are stored in the system database, enabling efficient management and monitoring of platform activities.

3. User Roles in the System

The KhetSetGo platform is designed to support two primary user roles:

Farmers:

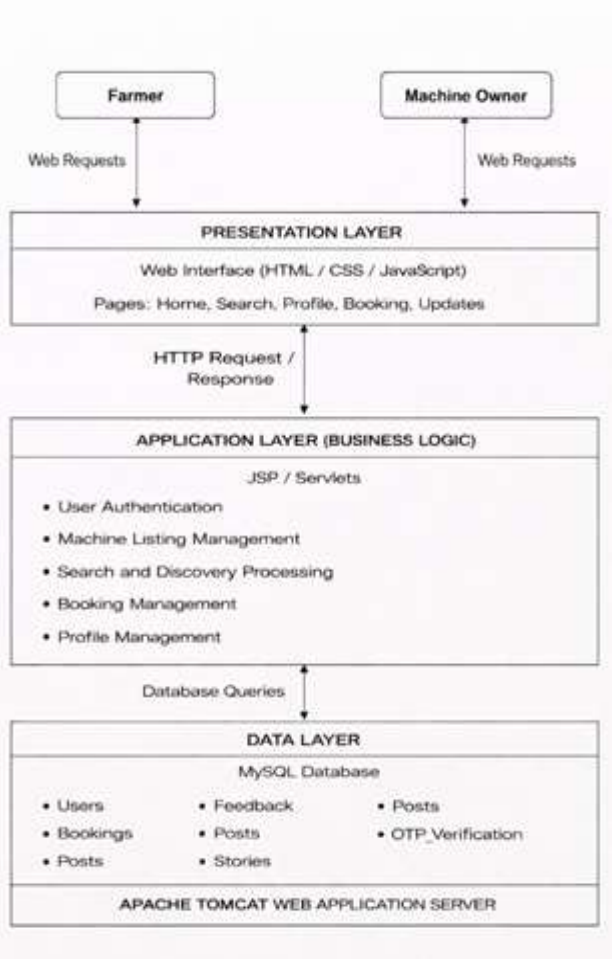
Farmers are the primary users who require agricultural machinery for various farming activities. Through the platform, farmer s can create accounts, browse available machines, view

equipment details, and submit booking requests. The system allows farmers to access machinery without the need for purchasing expensive equipment, which helps reduce operational costs and improve productivity.

Owners:
Machine owners are individuals or organizations that possess agricultural equipment and wish to rent it out to farmers. Through the platform, machine owners can register their accounts and list their machines with relevant details such as equipment specifications, images, rental price, and availability. The platform enables machine owners to manage their listings and respond to booking requests from farmers.

4. How the Platform Solves the Problem

KhetSetGo addresses the major challenges associated with agricultural machinery accessibility by providing a centralized digital platform that connects farmers and machine owners. By enabling farmers to easily search and book machinery online, the system reduces the dependency on informal networks and manual coordination.



The platform improves equipment utilization by allowing machine owners to rent out their idle machinery, which helps generate additional income while ensuring that valuable resources are effectively used. At the same time, farmers benefit from affordable and timely access to modern farming equipment without the need for large financial investments. Overall, the proposed system promotes efficient resource sharing, supports smart farming practices, and contributes to improving productivity in the agricultural sector.

V. SYSTEM ARCHITECTURE / SYSTEM DESIGN

A. System Architecture

The architecture of KhetSetGo – Empowering Farmers and Machine Owners is designed using a multi-layer web application structure that enables efficient interaction between users and the system. The platform follows a client–server architecture, where users access the system through a web interface, and the server processes requests and manages data using backend technologies and a database system.
The system is developed using Java Server Pages (JSP) and Servlets for backend processing, MySQL as the database for storing user and machine information, and HTML, CSS, and JavaScript for the frontend interface. The application is deployed on the Apache Tomcat server, which handles client requests and server responses.

The architecture consists of three major layers:

1. Presentation Layer
This layer provides the user interface through web pages where farmers and machine owners interact with the system. It includes features such as login, registration, equipment browsing, machine posting, and booking management.

2. Application Layer
This layer contains the business logic of the system implemented using JSP and Servlets. It processes user requests, validates inputs, manages machine listings, handles booking requests, and coordinates communication between different system modules.

3. Data Layer
The data layer manages the storage and retrieval of system data using a MySQL database. It stores information such as user profiles, machine details, booking records, payment information, and system updates.
This layered architecture ensures scalability, modularity, and efficient communication between system components.

B. System Modules

The KhetSetGo platform is composed of multiple functional modules that work together to provide a structured and efficient agricultural equipment rental service. Each module performs a specific task and contributes to the overall functionality of the

system. These modules ensure smooth interaction between farmers, machine owners, and the platform while maintaining proper management of data and system operations.

1. User Authentication Module

The User Authentication Module is responsible for managing user access and ensuring secure interaction with the platform. This module provides functionality for user registration, login authentication, and password recovery. During registration, users can select their role as either a farmer or a machine owner, and they must provide essential details such as username, phone number, and email address.

The system validates the user credentials during login and allows access only to authorized users. To enhance security, the system also includes an OTP-based password recovery mechanism, which allows users to securely reset their passwords in case they forget their login credentials. This module plays an important role in maintaining system security, user verification, and controlled access to platform services.

2. Machine Listing Module

The Machine Listing Module enables machine owners to add, manage, and display agricultural equipment available for rental on the platform. Through this module, machine owners can create equipment listings by providing detailed information such as machine name, machine type, description, rental price per day, location, and availability status. Owners can also upload images or media content to provide better visibility of the machinery.

Once the listing is submitted, the information is stored in the system database and becomes visible to farmers through the platform interface. Machine owners also have the ability to edit, update, or remove machine listings depending on availability. This module ensures that all equipment information is properly organized and easily accessible to users searching for machinery.

3. Machine Search and Discovery Module

The Machine Search and Discovery Module allows farmers to efficiently locate agricultural equipment based on their requirements. This module provides a search interface that enables farmers to filter machines using different parameters such as machine type, owner name, district, taluka, and location.

When a search request is submitted, the system retrieves relevant machine listings from the database and displays them to the farmer in an organized format. Farmers can then view machine details, including price, specifications, and owner information before making a booking request. This module significantly improves the discoverability of agricultural equipment and reduces the time required for farmers to find suitable machinery.

4. Booking Management Module

The Booking Management Module handles the entire process of machine booking between farmers and machine owners. Once a farmer identifies a suitable machine, they can submit a booking request through the platform. This request is recorded in the system and forwarded to the corresponding machine owner.

The machine owner receives the request and has the option to accept or reject the booking. If the request is accepted, the booking moves through multiple stages such as owner confirmation, payment request, work completion, and booking closure. The system maintains detailed records of all booking activities, allowing both farmers and owners to track the progress of each transaction. This module ensures a structured and transparent booking process within the platform.

5. Notification and Updates Module

The Notification and Updates Module provides real-time updates regarding booking activities and system events. Whenever a booking request is submitted, accepted, rejected, or completed, the system automatically generates notifications for the relevant users.

Both farmers and machine owners can view booking updates through the updates section of the platform, where they can track th e status of ongoing transactions. This module ensures effective communication between users and improves transparency throughout the rental process. By providing timely information about booking progress, payment status, and completion updates, the module enhances user experience and reduces uncertainty during equipment rental transactions.

6. Farmer Profile Management Module

The Farmer Profile Management Module allows farmers to manage and maintain their personal account information within the system. Farmers can view and update their profile details such as name, username, location, and contact information. This module also provides farmers with access to their booking history, saved machine posts, and activity records.

Through the booking history section, farmers can review past equipment rentals, check booking details, and access receipts or feedback options. Additionally, farmers can save machine posts for future reference and monitor their activity within the platform . This functionality enables farmers to efficiently manage their interactions with machine owners and maintain a clear record of their agricultural equipment usage.

7. Machine Owner Profile Management Module

The Machine Owner Profile Management Module enables machine owners to manage both their personal information and equipment-related data within the platform. Owners can update their profile details, including personal identification information, contact details, and location. In addition, this

module provides tools that allow machine owners to add new machine posts, edit existing listings, remove outdated machines, and publish equipment updates or announcements. Machine owners can also monitor booking requests submitted by farmers and manage machine availability accordingly. The module also maintains records of all equipment postings and rental activities associated with the owner.

By providing a centralized interface for managing equipment and booking interactions, this module helps machine owners efficiently organize their resources and maximize the utilization of their agricultural machinery through the KhetSetGo platform.

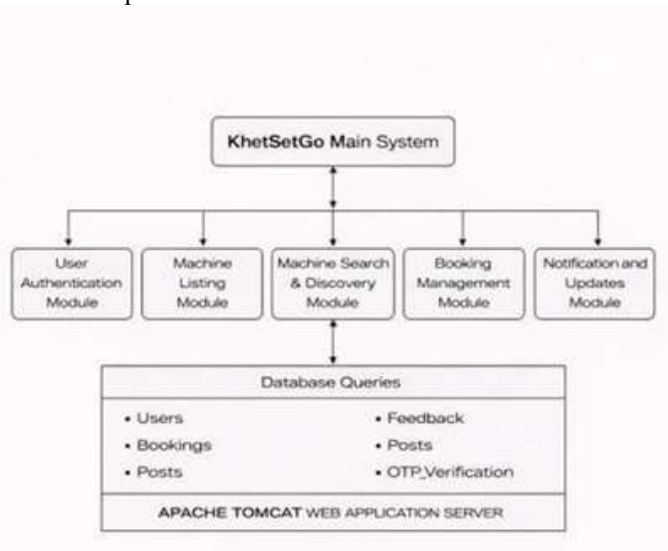


Figure 2. System Module Structure Diagram

VI. IMPLEMAINTATION

The implementation of the KhetSetGo platform focuses on developing a web-based system that connects farmers with agricultural machinery owners through a digital rental platform. The system is designed using modern web technologies and a structured client–server architecture to ensure reliability, usability, and scalability.

A. Technologies Used

The system is developed using the following technologies:

1. Java Server Pages (JSP)

JSP is used for creating dynamic web pages and displaying content retrieved from the server and database. It allows seamless integration between the front-end interface and backend logic.

2. Java Servlets

Servlets handle the server-side processing and manage user requests. They control the application logic, including authentication, booking requests, machine listings, and data communication with the database.

3. MySQL Database

MySQL is used as the relational database management system to store and manage all application data such as user information, machine listings, booking records, feedback, and system activity.

4. Apache Tomcat Server

Apache Tomcat is used as the web application server that hosts the JSP and Servlet-based application. It processes HTTP requests and manages communication between the web interface and backend logic.

5. HTML, CSS, and JavaScript

These technologies are used to design the user interface and improve user interaction. HTML provides the structure of web pages, CSS ensures responsive and visually appealing design, and JavaScript enables dynamic functionality within the web pages.

B. Development Process

1. Requirement Analysis:

The initial phase involved identifying the challenges faced by farmers in accessing agricultural machinery and understanding the needs of machine owners who wish to rent their equipment.

2. System Design:

During this stage, the system architecture, database structure, and data flow diagrams were designed to define how different modules of the system interact with each other.

3. Development Phase:

The system was developed using JSP and Servlets for backend functionality while HTML, CSS, and JavaScript were used for the front-end interface. Database connectivity was implemented using JDBC to interact with the MySQL database.

4. Testing Phase:

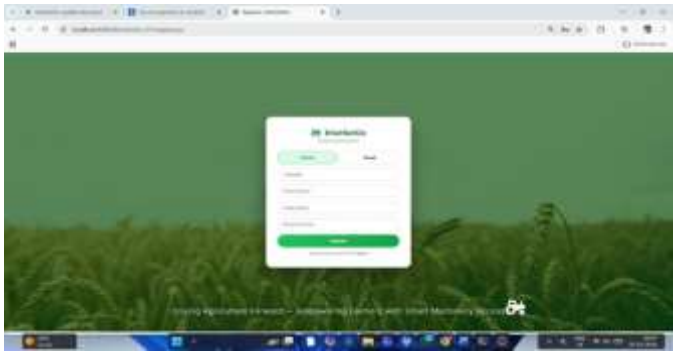
The application was tested to verify system functionality, database connectivity, booking operations, and user authentication. Various scenarios were tested to ensure reliability and performance.

5. Deployment:

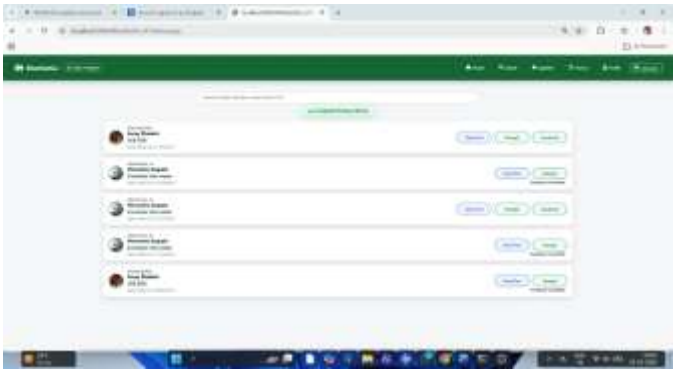
The system is deployed on the Apache Tomcat server, allowing users to access the platform through a web browser.

VII. RESULT

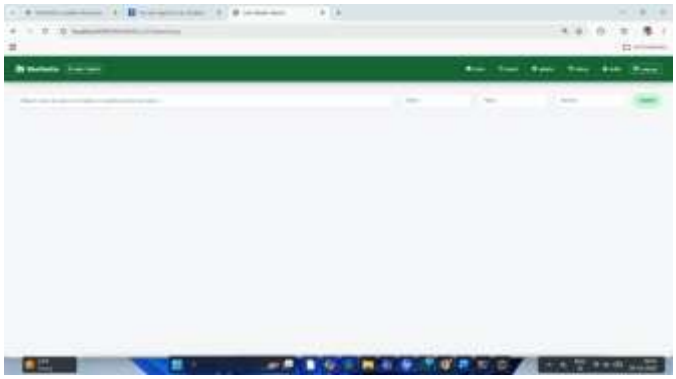
Home Page and Post Display Module



User Registration

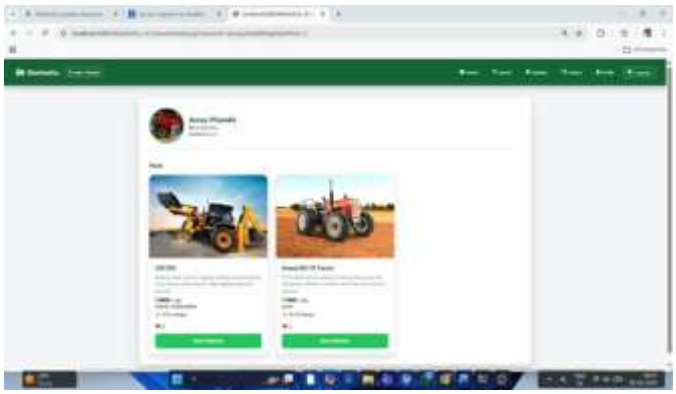


Booking History (farmer side)

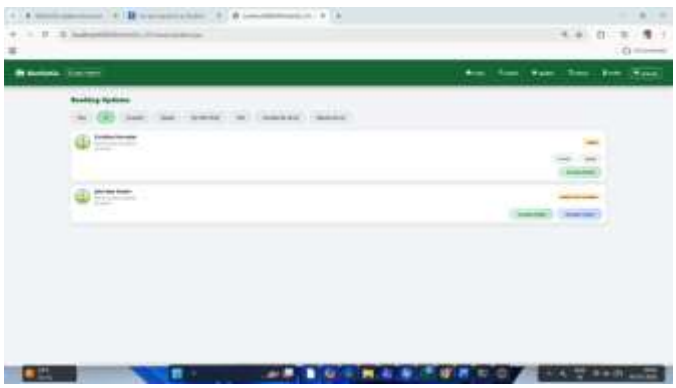


Search Module

Owner Profile Management



Owner Profile and Machine Listing



Booking Updates (owner side)

VIII. CONCLUSION

This research presents the design and implementation of KhetSetGo, a web-based agricultural machinery rental platform that aims to bridge the gap between farmers and machine owners. The system provides a centralized platform where farmers can search for agricultural equipment and submit booking requests, while machine owners can manage their machinery listings and monitor rental activities.

The implementation of the system using JSP, Servlets, MySQL, and Apache Tomcat demonstrates that web technologies can effectively support digital agricultural solutions. The platform improves machinery accessibility, enhances equipment utilization, and simplifies the rental process.

In future work, the system can be enhanced by integrating mobile applications, GPS-based machine discovery, multilingual support for rural users, and intelligent recommendation systems to suggest suitable machinery based on farming requirements.

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