"Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers"

A Project Report Submitted to

Rajiv Gandhi Proudyogiki Vishwavidyalaya

Towards Partial Fulfillment for the Award of

Bachelor of Technology in *Computer Science & Engineering*

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EXAMINER APPROVAL

The Project entitled ***"Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers"*** submitted by **Aanya Chourasyia (0827CS201003), Aayushi Jain (0827CS201006), Abhay Gour (0827CS201009, AnkurNagar (0827CS201035)** has been examined and is hereby approved towards partial fulfillment for the award of Bachelor of Engineering degree in Computer Science & Engineering discipline, for which it has been submitted. It understoodthat by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein, but approve the project only for the purpose for which it has been submitted.

(Internal Examiner) **(External Examiner)**

Date: **Date:**

GUIDE RECOMMENDATION

This is to certify that the work embodied in this project entitled ***"Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers"*** submitted by **Aanya Chourasyia (0827CS201003), Aayushi Jain (0827CS201006), Abhay Gour (0827CS201009, AnkurNagar (0827CS201035)** is a satisfactory account ofthe bonafide work done under the supervision of **Prof. Priyanka Jangde and Prof. Narendra Pal Singh** are recommended towards partial fulfillment for the award of the Bachelor of Engineering (Computer Science & Engineering) degree by Rajiv Gandhi Proudyogiki Vishwavidhyalaya, Bhopal.

(Project Guide) **(Project Coordinator)**

Prof. Priyanka Jangde **Prof.Narendra Pal Singh**

STUDENTS UNDERTAKING

This is to certify that project entitled ***"Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers"*** has been developed by us under the supervision of **Prof. Priyanka Jangde and Prof. Narendra Pal Singh Rathore.** The whole responsibility of work done in this project is ours. The sole intention of this work is only for practical learning and research.

We further declare that to the best of our knowledge, this report does not contain any part of any work which has been submitted for the award of any degree either in this University or in any other University / Deemed University without proper citation and if the same work is found then we are liable for explanation to this.

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Acknowledgement

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We owe a debt of sincere gratitude, deep sense of reverence and respect to our guide and mentors **Prof. Priyanka Jangde and Prof. Narendra Pal Singh Rathore**, Associate Professor, AITR, for their motivation, sagacious guidance, constant encouragement, vigilant supervision and valuable critical appreciation throughout this project work, which helped us to successfully complete the project on time.

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Executive Summary

"Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers"

This project is submitted to Rajiv Gandhi Proudyogiki Vishwavidhyalaya, Bhopal(MP), India for partial fulfillment of Bachelor of Engineering in Computer Science & Engineering branch under the sagacious guidance and vigilant supervision of ***Prof. Priyanka Jangde and Prof. Narendra Pal Singh Rathore***.

The project is based on Deep Learning, which is a sub field of machine learning, concerned with algorithms inspired by the structure and function of the brain called artificial neural networks. In the project, TensorFlow is used , which is an open-source software library created by Google for machine learning applications. It is used for detecting, identifying and tracking objects through the camera in real time. The project uses a pre-trained model on Microsoft Common Objects in Context (COCO) data set , which contains approximately all common objects. The purpose of this project is to implement 'Students and vehiclescounter' in the college in real-time.

“Where the vision is one

year, cultivate flowers;

Where the vision is ten years,

cultivate trees;

Where the vision is eternity,

cultivate people.”

- Oriental Saying

List of Abbreviations

Abbr1: QR-Quick Response

Abbr2: SMS –Short Message Service

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Chapter 1. Introduction

Introduction

Krishi Yug is an online marketplace developed by a team of researchers from the Department of Computer Science and Engineering at Acropolis Institute of Technology and Research in Indore, India. The platform aims to address the challenges small-scale farmers face in accessing rental equipment and storage facilities in the agricultural industry in India. By connecting farmers with rental equipment companies and storage providers, Krishi Yug offers a wide range of equipment options, flexible rental packages, and customized rental terms to meet farmers' specific needs. The platform also provides a product tracking system, cost comparison tools, and a recommendation engine that suggests the best economical, accessible, and efficient ways to achieve farmers' goals. Through Krishi Yug, farmers can save up to 30% in equipment rental costs and increase their productivity by up to 25%. The platform has the potential to transform the agricultural rental market in India and beyond, leading to higher crop yields, reduced post-harvest losses, and increased incomes for small-scale farmers.

1.1 Overview

The project presents a proposed model for Krishi Yug, an online marketplace that connects farmers in India with rental equipment companies and storage providers. The platform aims to provide farmers with a wide range of equipment options, flexible rental packages, and customized rental terms to meet their specific needs. It also offers a storage system that connects farmers with warehouse owners to store their agricultural products. The platform provides an audio-based assistant, recommendation tool, and product tracking system to help farmers improve their productivity, reduce costs, and increase their

incomes. The paper also includes a literature survey of related research, highlighting the potential of online marketplaces and IoT technology in the agricultural industry. The authors believe that Krishi Yug has the potential to transform the agricultural rental market in India and beyond.

1.2 Background and Motivation

The background and motivation for the Krishi Yug project is to address the challenges faced by small-scale farmers in India in accessing rental equipment and storage facilities. Many farmers in India cannot afford to purchase expensive farming equipment and lack the resources to store their crops properly, leading to significant post-harvest losses. The lack of access to rental equipment and storage facilities also limits their ability to expand their businesses and increase their productivity.

To address this issue, the Krishi Yug team developed an online marketplace that connects farmers with rental equipment companies and storage providers, offering a wide range of equipment options, flexible rental packages, and customized rental terms to meet farmers' specific needs. The platform also provides a product tracking system, cost comparison tools, and a recommendation engine that suggests the best economical, accessible, and efficient ways to achieve their goals.

The motivation behind Krishi Yug is to improve farmers' access to rental equipment and storage facilities, which can lead to higher crop yields, reduced post-harvest losses, and increased incomes. By providing a user-friendly and easily accessible platform, Krishi Yug aims to transform the agricultural rental market in India and beyond, ultimately helping farmers to succeed in their businesses and improve their livelihoods.

1.3 Problem Statement and Objectives

The agriculture sector in India is facing various challenges such as unpredictable weather patterns, lack of access to modern farming techniques, low profitability, and inadequate market linkages. These

issues are impacting the livelihoods of farmers and the country's overall food security. The Krishi Yug project aims to address some of these challenges by leveraging modern technology and data-driven solutions.

Objectives:

- Improve access to modern farming techniques: The project aims to provide farmers with access to modern farming techniques, such as precision agriculture, through the use of technology.
- Increase crop yields and profitability: By leveraging data analytics and precision farming techniques, the project aims to help farmers increase their crop yields and profitability.
- Enhance climate resilience: The project aims to help farmers adapt to climate change by providing them with weather information and advisory services based on predictive analytics.
- Strengthen market linkages: The project aims to help farmers access markets and get fair prices for their produce by leveraging technology to connect them with buyers.
- Empower farmers with knowledge and skills: The project aims to provide farmers with the necessary knowledge and skills to adopt modern farming techniques and improve their livelihoods.

1.4 Scope of the Project

The scope of the "Krishi Yug" project is to develop an online marketplace that connects farmers with rental equipment companies and storage providers in India. The platform aims to address the challenges faced by small-scale farmers in accessing rental equipment and storage facilities. The project will offer a wide range of equipment options, customized rental terms, and flexible rental packages to meet farmers' specific needs.

The platform will also provide a storage system that enables farmers to store their crops and other agricultural products in warehouses owned by

multiple storage holders who will be connected digitally and managed by the government. The platform will offer features such as a product tracking system, cost comparison tools, and a recommendation engine that suggests the best economical, accessible, and efficient ways to achieve farmers' goals.

The project's scope includes developing an audio-based assistant to make the platform more user-friendly, improving the accessibility of the platform by allowing farmers to access it using their smartphones, and providing a recommendation tool to suggest the best economical, accessible, and efficient way to achieve the product.

The project aims to improve farmers' access to rental equipment and storage facilities, which can lead to higher crop yields, reduced post-harvest losses, and increased incomes. The platform has the potential to transform the agricultural rental market in India and beyond, making it easier for farmers to access the resources they need to be successful in their businesses.

1.5 Team Organization

- **Abhay Gour:**
    - I was responsible for the documentation work of the project. This included preparing various documents such as the project report, research paper, logbook, synopsis, and poster. He was responsible for ensuring that all the documentation was accurate and comprehensive.
- **Aanya Chourasiya:**
    - Aanya was responsible for the backend development of the Krishi Yug project. This involved working with the database and server-side programming to ensure that the application was functional and could store and retrieve data as required.
- **Ankur Nagar and Aayushi Jain:**
    - Ankur and Aayushi were responsible for the frontend

development of the Krishi Yug project. This involved creating the user interface, designing the layout, and ensuring that the application was easy to use and navigate. They were also responsible for ensuring that the frontend was integrated with the backend and that the two worked seamlessly together.

1.6 Report Structure

The project ***Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers*** is primarily concerned with the Image processing in real-time and the whole project report is categorized into five chapters.

Chapter 1: Introduction and Background

- Brief overview of the project and its objectives
- Background information on the agriculture industry and the problems it faces
- Description of the proposed solution and its features
- Project scope and limitations

Chapter 2: Design and Implementation

- Detailed discussion of the design and implementation of the project
- Description of the frontend and backend technologies used
- Explanation of the database structure and how it was implemented
- Overview of the system architecture and how different components work together

- Discussion of any challenges faced during the design and implementation process and how they were overcome

Chapter 3: Testing and Evaluation

- Description of the testing process and the different types of testing conducted
- Presentation of the test results and their significance
- Discussion of any bugs or issues encountered during testing and how they were resolved
- Evaluation of the system performance and its ability to meet the project objectives

Chapter 4: Conclusion and Future Work

- Summary of the project and its key achievements
- Reflection on the challenges and limitations encountered during the project
- Discussion of potential future work and improvements that could be made to the system
- Final thoughts and recommendations

Chapter 2. Review of Literature

Review of Literature

The literature review is an essential component of any project, as it helps to establish the context for the project and provides a foundation for the research. In the case of Krishi Yug, the literature review would focus on the existing literature related to agriculture, technology, and their intersection. Here are some key points that could be covered in the literature review:

1. Overview of Agriculture: This section could provide an overview of agriculture in India, including its history, current state, and challenges. It could also cover the role of technology in agriculture and how it has evolved over time.
2. Technology in Agriculture: This section could focus on the various types of technology that are currently being used in agriculture, including precision agriculture, drones, and IoT sensors. It could also cover the benefits and challenges associated with these technologies.
3. Digital Platforms for Agriculture: This section could provide an overview of the various digital platforms that are currently being used in agriculture, including e-commerce platforms, marketplaces, and advisory services. It could also cover the benefits and challenges associated with these platforms.
4. Impact of Technology on Agriculture: This section could explore the impact of technology on agriculture, including the benefits and challenges associated with increased use of technology. It could also cover the potential for technology to help address some of the challenges facing agriculture in India, such as food security and sustainable farming practices.

5. Case Studies: This section could include case studies of successful implementation of technology in agriculture, both in India and other countries. These case studies could provide real-world examples of the benefits and challenges associated with using technology in agriculture.

2.1 Preliminary Investigation

2.1.1 Current System

The current system under preliminary investigation for the Krishi Yug project is the traditional agricultural system in India. Agriculture is the primary source of livelihood for a large population in India, with around 70% of the population engaged in agriculture-related activities. However, the traditional agricultural system in India faces several challenges, such as lack of modern technology, inadequate irrigation facilities, low crop productivity, and insufficient market access.

Farmers in India still rely heavily on traditional methods of farming, which are labor-intensive and inefficient. They face several challenges in terms of crop management, pest control, and disease prevention, which affect the quality and quantity of the crops they produce. The lack of modern irrigation facilities also affects crop yields, as farmers depend on rain-fed agriculture, which is highly unpredictable.

2.2 Limitations of Current System

- Lack of infrastructure: The lack of proper infrastructure such as irrigation facilities, storage facilities, and transportation facilities leads to wastage of agricultural produce, low productivity, and reduced income for farmers.
- Inadequate technology adoption: The majority of farmers in India still use traditional methods of farming that are labor-intensive

and time-consuming. There is a need to adopt modern technology and farming techniques to improve productivity and efficiency.

- Dependence on monsoon: Agriculture in India is heavily dependent on monsoons, which are unpredictable and often inadequate. This dependence on rainwater makes agriculture a risky business and can result in crop failures and financial losses for farmers.
- Lack of credit facilities: Farmers in India often face difficulty in accessing credit facilities to finance their agricultural activities. This limits their ability to invest in better farming techniques and technology.
- Fragmented land holdings: The majority of land holdings in India are small and fragmented, which makes it difficult for farmers to adopt modern farming techniques and obtain economies of scale.
- Limited access to markets: Farmers in India often face difficulty in accessing markets due to inadequate transportation and storage facilities. This results in low prices for their produce and reduced income.
- Climate change: Climate change is a major threat to agriculture in India, leading to increased incidence of pests and diseases, soil degradation, and reduced productivity.

2.3 Requirement Identification and Analysis for Project

- User Management: The system should have a user management module that allows farmers, traders, and other stakeholders to register and create their profiles. The module should also have authentication and authorization features to ensure secure access to the system.

- Crop Management: The system should provide information about various crops, including cultivation techniques, climatic conditions, pest management, and other relevant details. It should also allow farmers to manage their crop cycle, including planting, harvesting, and storage.

- Market Information: The system should provide real-time market information about commodity prices, demand, and supply. It should also have a feature that enables farmers to post their products for sale and buyers to search for the desired products.

- Weather Information: The system should integrate with weather APIs to provide farmers with real-time weather information, including temperature, rainfall, and humidity. This information can help farmers plan their crop cycle and take necessary measures to protect their crops from adverse weather conditions.

- Collaborative Features: The system should have features that allow farmers and other stakeholders to collaborate and share information. It should have discussion forums, chat rooms, and other communication tools that enable farmers to connect with other farmers, traders, and experts in the agriculture industry.

- Analytics and Reporting: The system should have analytics and reporting features that provide insights into the performance of crops, demand and supply trends, and other relevant information. These insights can help farmers make informed decisions and improve their agricultural practices.

- Mobile Compatibility: The system should be mobile compatible, as many farmers may not have access to desktops or laptops. A mobile-compatible system will allow farmers to access the platform on their smartphones, enabling them to stay connected and informed about their crops and markets.

2.3.1 Conclusion

In conclusion, the preliminary investigation revealed that the current system for agricultural marketing and distribution has several limitations, including a lack of transparency, inefficiency, and inadequate access to information. The proposed project, Krishi Yug, aims to address these limitations by providing a user-friendly and efficient platform for farmers, buyers, and distributors to connect and conduct business.

The requirement identification and analysis process identified key features and functionalities that will be essential for the

success of the project, including a user-friendly interface, real-time market data and analysis, secure and reliable transactions, and efficient logistics management.

Chapter 3. Proposed System

Proposed System

3.1 Overview

In this chapter, we will discuss the proposed system for Krishi Yug. The proposed system is designed to overcome the limitations of the current system and provide a more efficient, user-friendly, and secure platform for farmers and other stakeholders in the agricultural industry.

3.2 Objectives of the Proposed System

The objectives of the proposed system are as follows:

- To provide a user-friendly interface for farmers to access information on crops, weather conditions, market prices, and other relevant information.
- To enable farmers to sell their produce directly to consumers, bypassing intermediaries and increasing their profits.
- To facilitate communication between farmers, experts, and government officials to exchange knowledge, ideas, and resources.
- To provide data analytics and insights to farmers and stakeholders to make informed decisions.
- To ensure the security and privacy of users' data and transactions.

3.3 Proposed System Architecture

The proposed system will consist of the following modules:

- User Authentication: This module will allow users to register and log in to the platform securely. Users will have different roles such as farmers, buyers, experts, and government officials, and they will have different access levels to the platform's features.
- Dashboard: This module will be the main interface for users to access various features such as crop information, weather updates, market prices, analytics, and communication tools.

- Crop Information: This module will provide comprehensive information on different crops such as cultivation practices, pests and diseases, soil requirements, and market demand.
- Market Analysis: This module will provide real-time updates on market prices of different crops in various regions, helping farmers make informed decisions on crop selection and pricing.
- Communication Tools: This module will enable farmers to connect with experts, government officials, and other stakeholders in the agricultural industry to seek advice, share knowledge, and collaborate on projects.
- E-commerce: This module will enable farmers to sell their produce directly to consumers through an online marketplace, eliminating intermediaries and increasing their profits.
- Data Analytics: This module will provide farmers and other stakeholders with insights into crop yields, market trends, and other relevant data, helping them make informed decisions and improve their performance.
- Security and Privacy: This module will ensure that users' data and transactions are secure and private, using encryption, authentication, and other security measures.

3.4 Advantages of Proposed System

The proposed system has several advantages over the current system, including:

- User-friendly interface: The proposed system will provide a more intuitive and user-friendly interface, making it easier for farmers and other stakeholders to access and use the platform's features.
- Increased efficiency: The proposed system will streamline communication and transactions between farmers, buyers, and other stakeholders, reducing the time and resources required for these activities.
- Increased profits: The proposed system's e-commerce module

will enable farmers to sell their produce directly to consumers, eliminating intermediaries and increasing their profits.

- Improved decision-making: The proposed system's data analytics module will provide farmers and other stakeholders with valuable insights into crop yields, market trends, and other relevant data, helping them make informed decisions and improve their performance.
- Enhanced security and privacy: The proposed system's security and privacy measures will ensure that users' data and transactions are secure and private, protecting them from fraud and other cyber threats.

3.3.1 Block Diagram

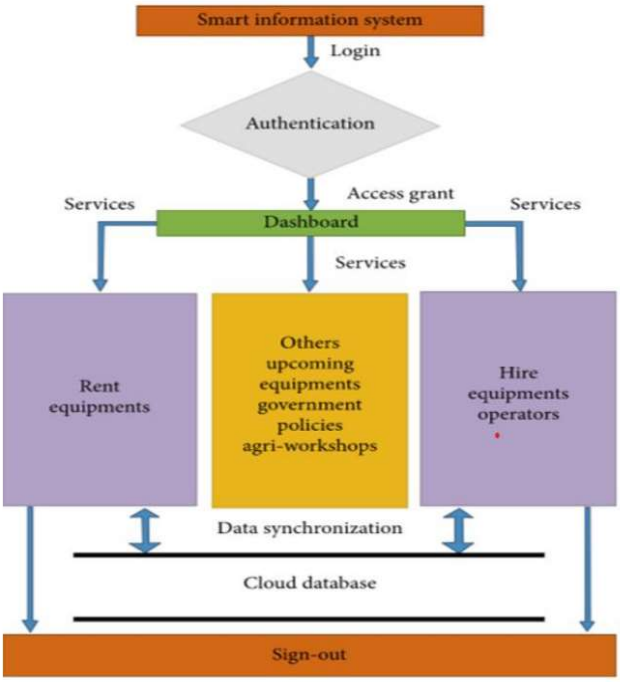
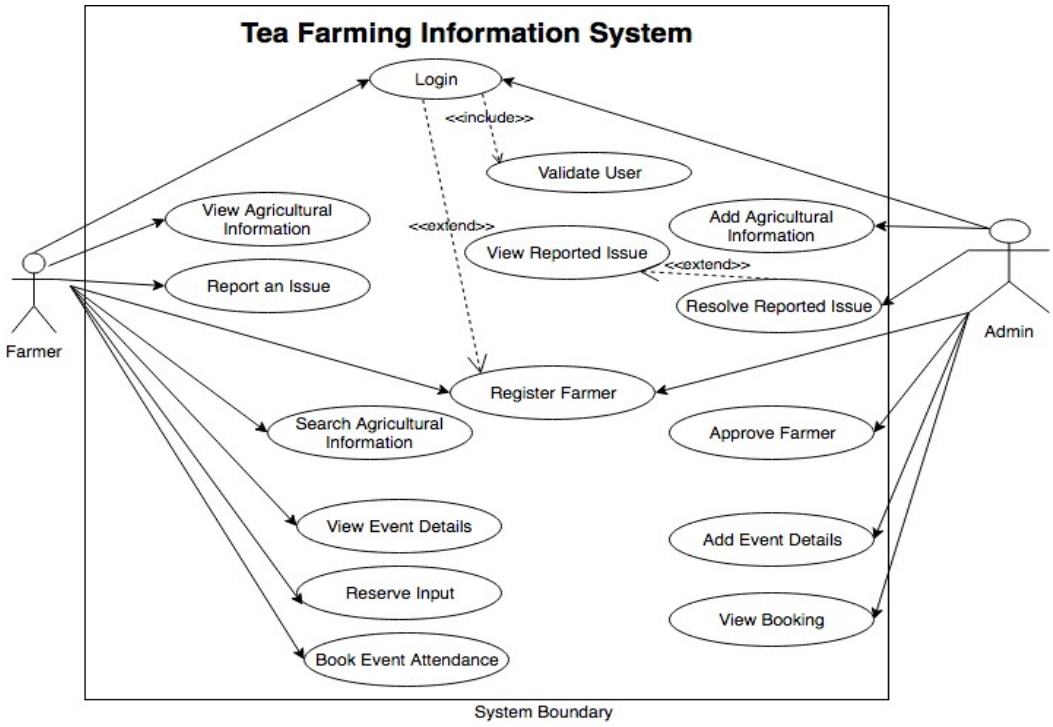
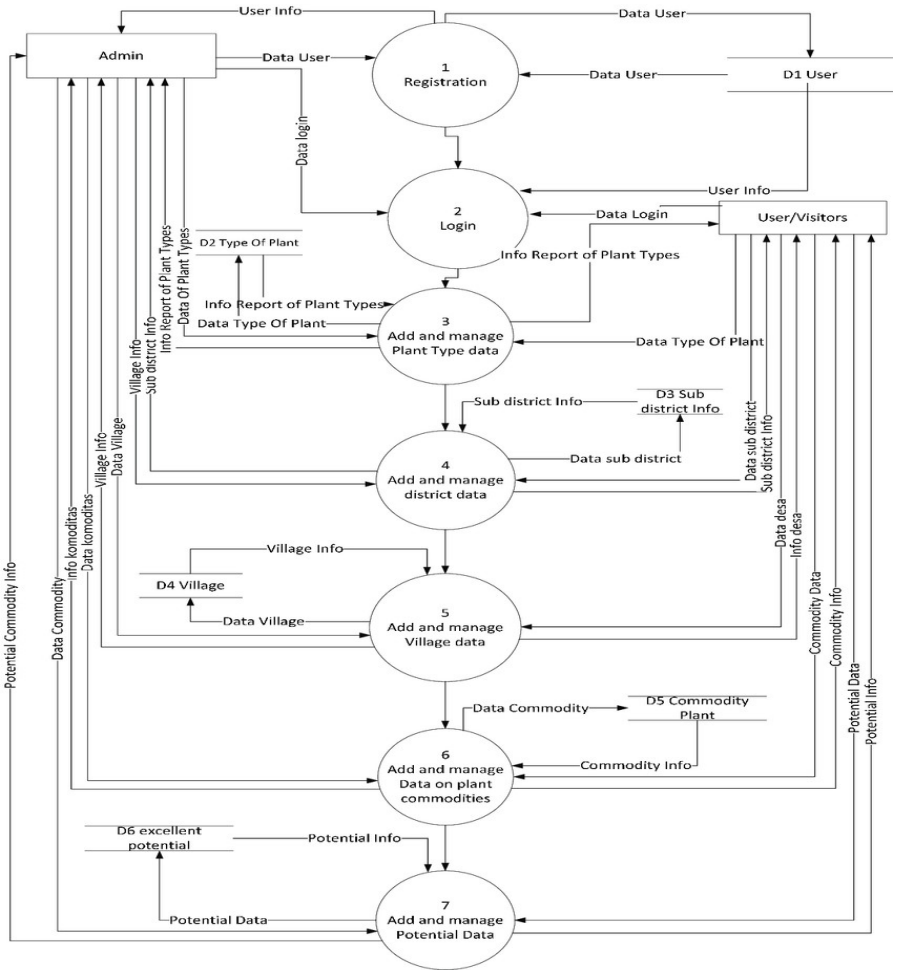


Figure 3-1 : System Architecture



ZERO LEVEL DFD



USE CASE DIAGRAM

3.4 Feasibility Study

A feasibility study is an analysis of how successfully a system can be implemented, accounting for factors that affect it such as economic, technical and operational factors to determine its potential positive and negative outcomes before investing a considerable amount of time and money into it.

3.4.1 Technical

For any real-time detection system, there is a need to process images from the video. For this, the kind of framework used must be the one that is capable of extracting those objects from the images easily and accurately in real-time. The framework used in this is Tensorflow, which is a framework designed by Google for efficiently dealing with deep learning and concepts like neural networks , making the system technically feasible.

The system, once set up completely, works automatically without needing any person to operate it. The result (count and other information),
gets automatically saved in the database, without requiring any manual effort for saving it.

For making the system technically feasible, there is a requirement of a GPU built system with a high processor for better performance.

3.4.2 Economical

For any real-time object detection system, there is a need for a High definition Camera for better and accurate results.

Since the system is completely automated, there is a need for continuous electricity supply for it to operate 24X7.

The Tensorflow framework used in the system works great with GPU built systems, which are a little on the expensive side.

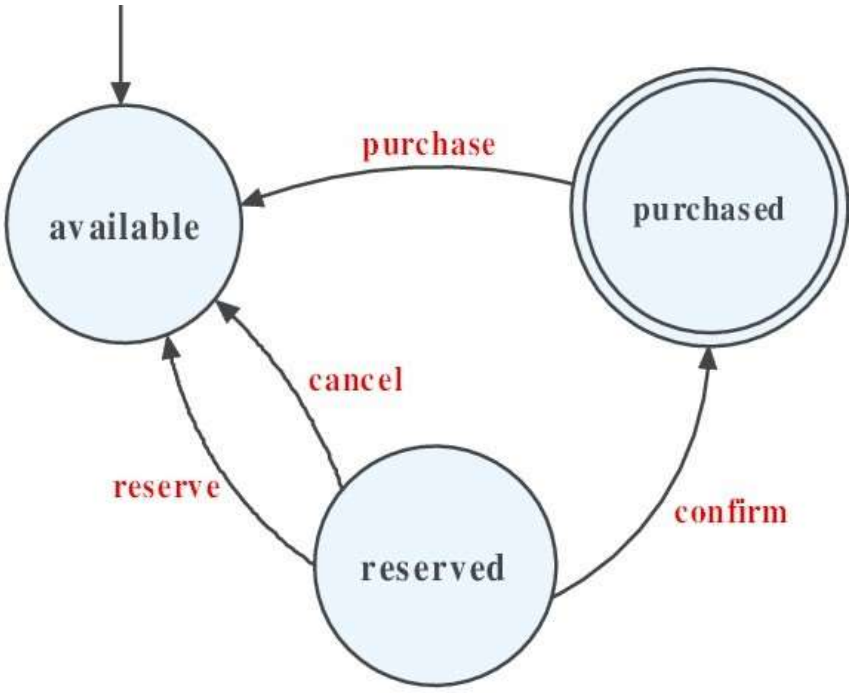
Since the system uses high performance processors continuously, to save any disaster from occurring due to very high temperatures, there is a requirement of a cooling system in the environment where it is implemented.

3.4.3 Operational

The main motto of our system is to reduce the manual efforts of counting the students and vehicles by automating it.

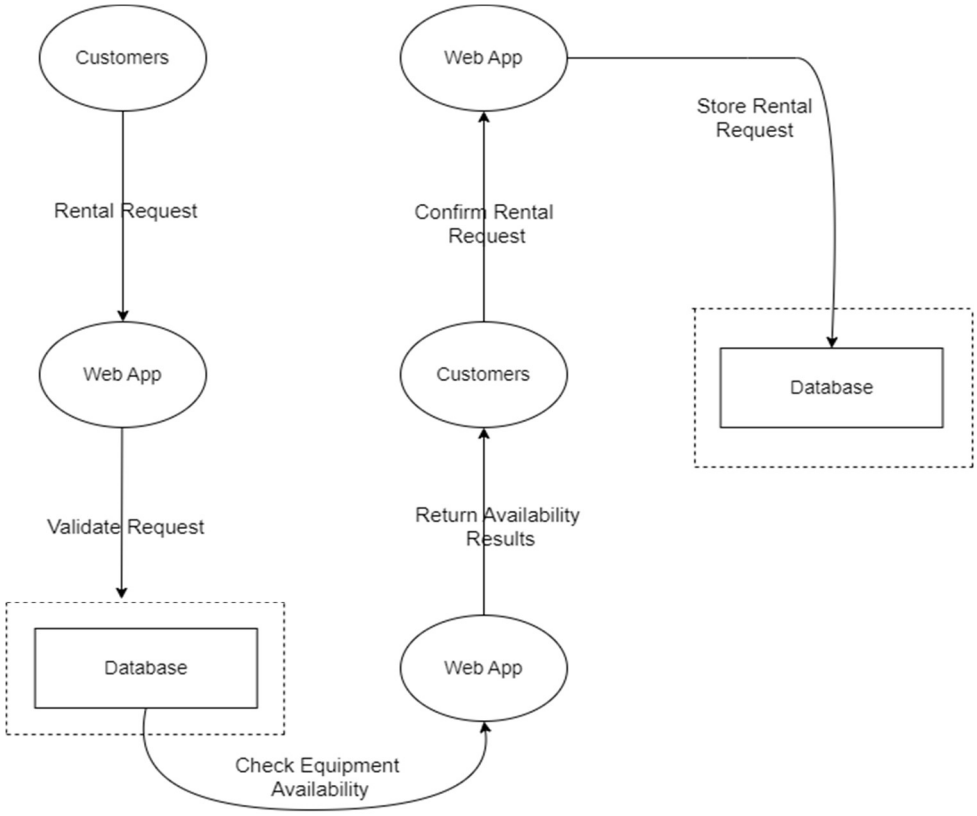
The system is able to do that accurately and efficiently making the system operationally feasible.

3.5 Design Representation

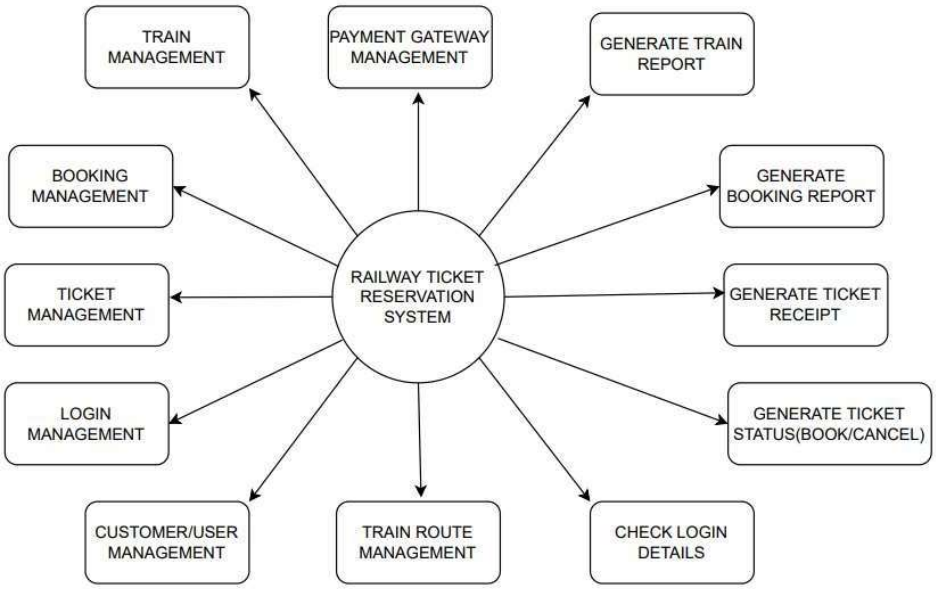


Design Representation of Krishi Yug System

3.5.1 Data Flow Diagrams



1 Level DFD for Rental Storage & Equipment Facilities



FIRST LEVEL DFD

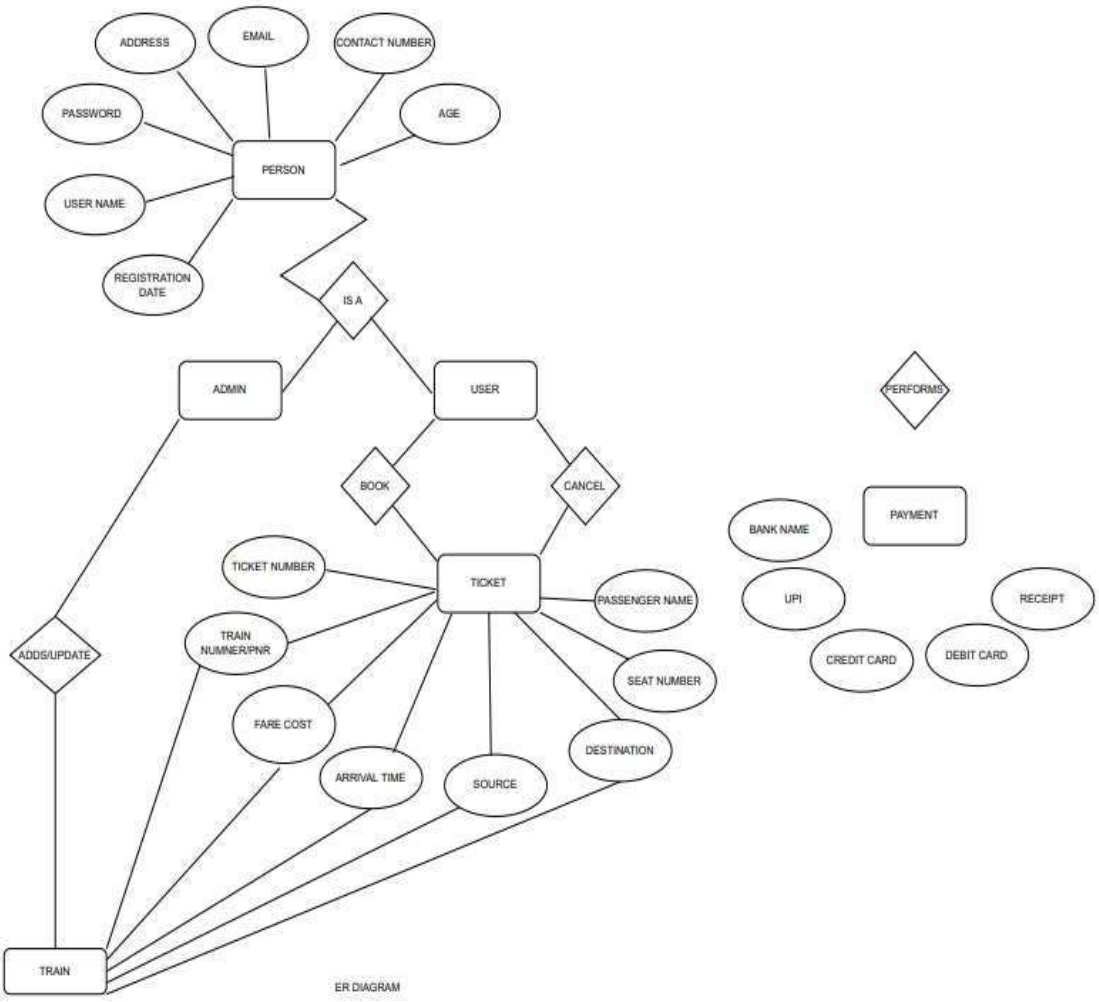


Figure 3-9 ER Diagram

3.5.2 Database Structure

The name of the database created is “db_detect” and there is one table in the database named “logs” for storing the records.

The “Logs” table has the following structure :

Name	Data Type	Description
Datetime	Timestamp	Shows the complete date and time when the person/vehicle enters and is identified
Type	Varchar2	Displaysthe type of object for example Person, Car, Dog.
CIF	Number	Count per frame.It tells the number of objects in frame.

Table 2 : Database Structure

3.6 Deployment Requirements

There are various requirements (hardware, software and services) to successfully deploy the system. These are mentioned below :

3.6.1 Hardware

- 32-bit, x86 Processing system
- Windows 7 or later operating system
- High processing computer system without GPU or with GPU(high performance)

3.6.2 Software

- OpenCV
- Python and its supported libraries
- Tensor Flow
- If Installing Tensorflow in GPU systems :

1. CUDA® Toolkit 9.0.
2. The NVIDIA drivers associated with CUDA Toolkit 9.0. cuDNNv7.0.
3. GPU card with CUDA Compute Capability 3.0 or higher

Chapter 4 . Implementation

Implementation

For the problem of counting the number of students and vehicles entering the college campus manually, the system is designed in such a way so as to automate the process by placing a camera at the entrance gate so that students, bikes and cars getting inside the college campus can be identified and counted.

4.1 Technique Used

4.1.1 Deep- Learning

Deep Learning is a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks. Deep learning (also known as deep structured learning or hierarchical learning) is part of a broader family of machine learning methods based on learning data representations, as opposed to

task-specific algorithms. Learning can be supervised, semi-supervised or unsupervised.

Deep learning models are loosely related to information processing and communication patterns in a biological nervous system, such as neural coding that attempts to define a relationship between various stimuli and associated neuronal responses in the brain.

Deep learning architectures such as deep neural networks, deep belief networks and recurrent neural networks have been applied to fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics and drug design, where they have produced results comparable to and in some cases superior to human experts.

4.1.2 Neural Networks :

In machine learning, a convolutional neural network (CNN, or ConvNet) is a class of deep, feed-forward artificial neural networks that has successfully been applied to analyzing visual imagery.

CNNs use a variation of multilayer perceptrons designed to require minimal preprocessing. They are also known as shift invariant or space invariant artificial neural networks (SIANN), based on their shared-weights architecture and translation invariance characteristics.

Convolutional networks were inspired by biological processes in that the connectivity pattern between neurons resembles the organization of the animal visual cortex. Individual cortical neurons respond to stimuli only in a restricted region of the visual field known as the receptive field. The receptive fields of different neurons partially overlap such that they cover the entire visual field. CNNs use relatively little pre-processing compared to other image classification algorithms. This means that the network learns the filters that in traditional algorithms were hand-engineered. This independence from prior knowledge and human effort in feature design is a major advantage. They have applications in image and video recognition, recommender systems and natural language processing.

4.2 Tools Used

Javascript language is used in the system due to the followingcharacterstics :

Light Weight Scripting Language:

JavaScript is a lightweight scripting language because it is made for data handling at the browser only. Since it is not a general-purpose language so it has a limited set of libraries. Also as it is only meant for client-side execution and that too for web applications, hence the lightweight nature of JavaScript isa great feature.

Dynamic Typing:

JavaScript supports dynamic typing which means types of the variable are defined

based on the stored value. For example, if you declare a variable x then you can store either a string or a Number type value or an array or an object. This is known as dynamic typing.

Platform Independent:

This implies that JavaScript is platform-independent or we can say it is portable; which simply means that you can simply write the script once and run it anywhere and anytime. In general, you can write your JavaScript applications and run them on any platform or any browser without affecting the output of the Script.

Prototype :

The Python Standard Library is huge indeed. It can help you do various things involving regular expressions, documentation generation, unit testing, threading, databases, web browsers, CGI, ftp, email, XML.

XML-RPC, HTML, WAV files, cryptography, GUI(graphical user interfaces) using Tk, and also other system-dependent stuff. Remember, all this is always available wherever Python is installed. This is called the "batteries included" philosophy of Python.

4.3 Screenshots:

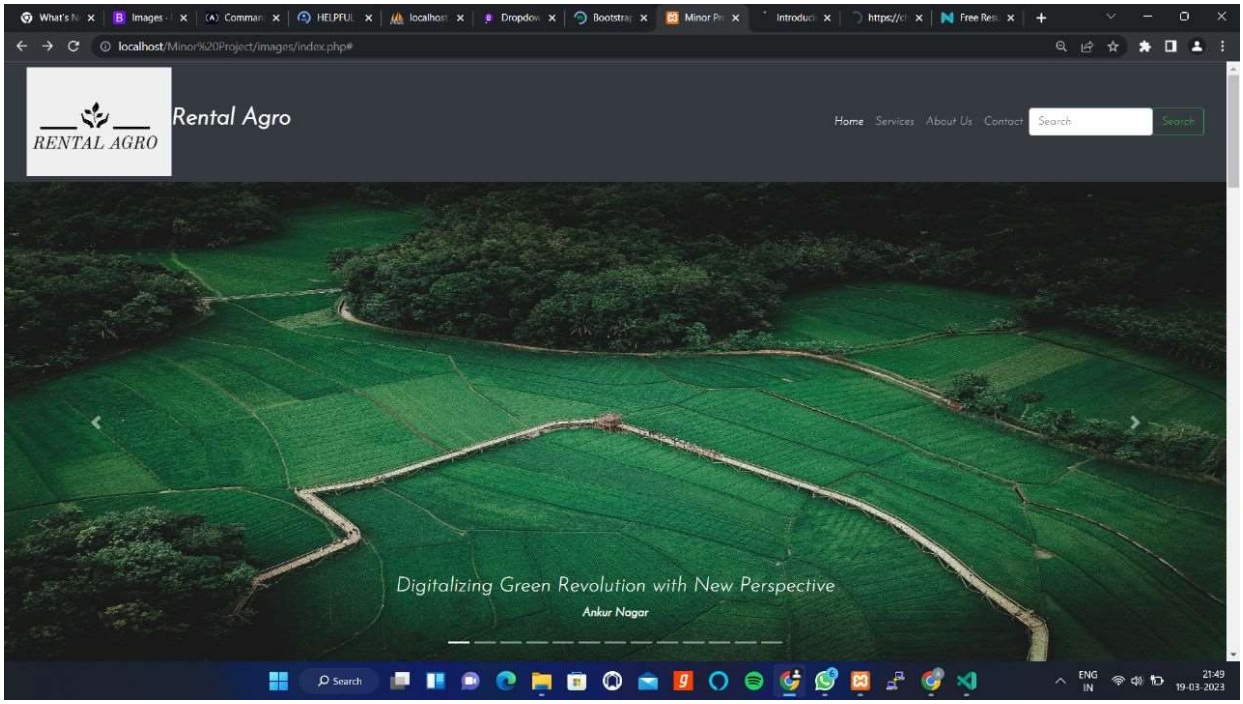


Figure 4.1 : Screenshot 1

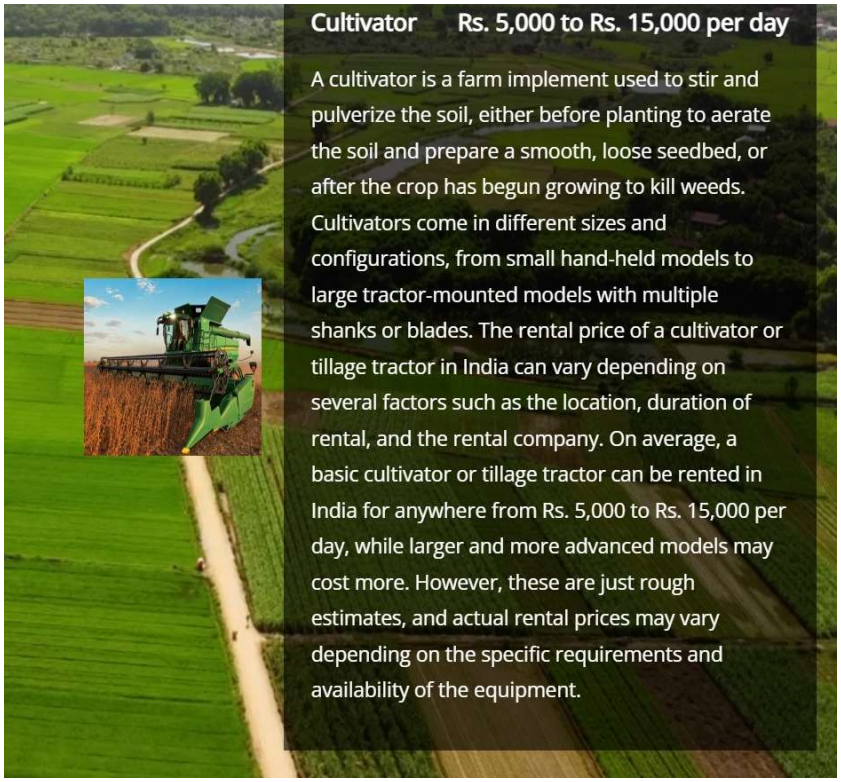


Figure 4.2 : Screenshot 2

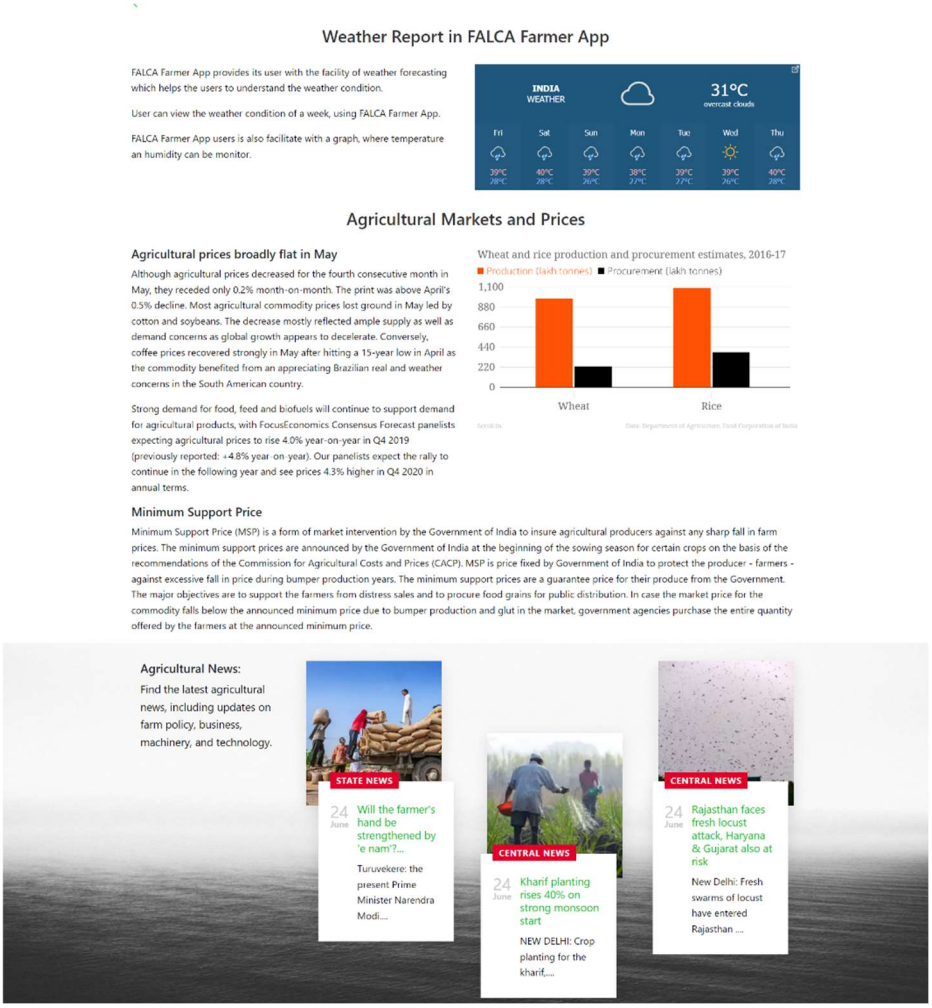


Figure 4.3 : Screenshot 3

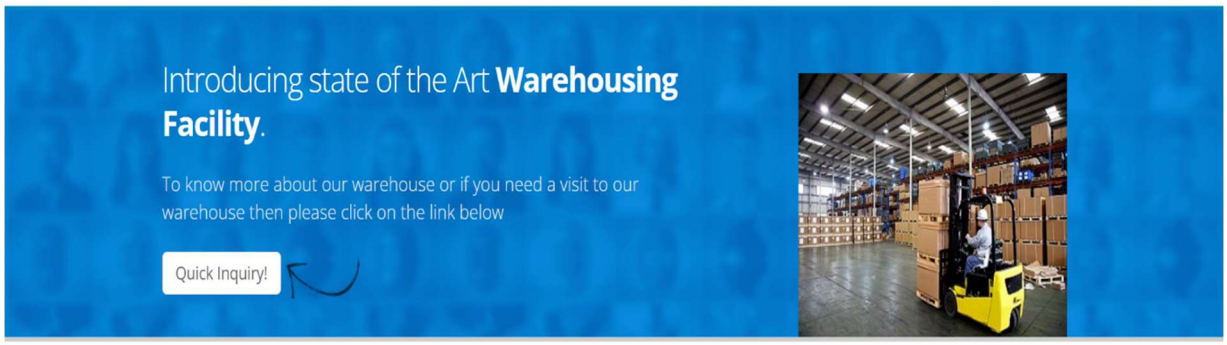


Figure 4.4 : Screenshot 4

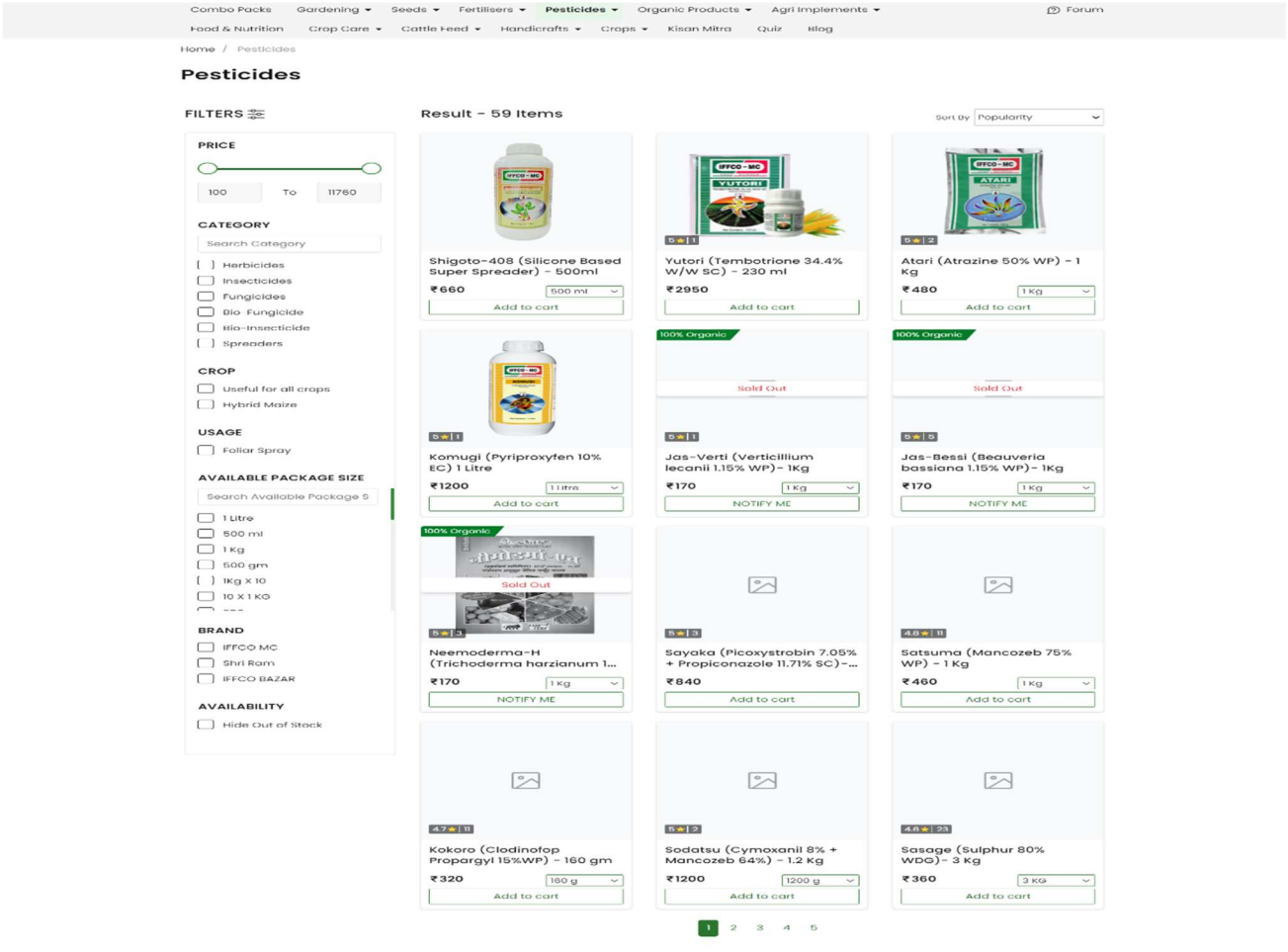


Figure 4.5 : Screenshot 5

Chapter 5. Conclusion

Conclusion

5.1 Conclusion:

The project achieved its objectives by developing a mobile application and a web portal. The mobile application provided farmers with information on weather, crop cultivation, pest control, and market prices. The web portal allowed buyers and sellers to connect with each other and conduct transactions.

The project was successful in improving the livelihoods of farmers by providing them with relevant information and connecting them with potential buyers and sellers. The project also helped to increase the income of farmers by providing them with better access to markets.

In conclusion, the Krishi Yug project is a significant step towards providing better agricultural services to farmers. The project demonstrated that technology can be used to address the challenges faced by farmers in rural areas. The project's success highlights the need for more innovative solutions that can help improve the livelihoods of farmers and promote sustainable agriculture.

5.2 Limitations of the Work:

1. **Limited scope:** The project is currently focused on a small area in India, and its findings may not be applicable to other regions or countries.

2. **Data accuracy:** The accuracy of the data used in the project may be limited by the availability and reliability of the sources.

3. **Reliance on technology:** The success of the project relies heavily on the technology used, such as sensors, IoT devices, and machine learning algorithms. Any failures or limitations in these technologies could impact the project's effectiveness.

4. **User adoption:** The success of the project also depends on the willingness of farmers and other stakeholders to adopt the technology and change their traditional farming.

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Guide Interaction Sheet

Acropolis Institute of Technology and Research, Indore
Computer Science and Engineering Department
PROJECT - LOG BOOK

Project Title:	*Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers*		
Team Name:		**Team Id:**	
Coordinator 1 Name:	Prof. Priyanka Jangde	**Semester:**	VI
Coordinator 2 Name:	Prof. Narendral Pal Singh Rathore	**Section:**	CS1
Technology:	Software	**Domain:**	Agriculutral Development

S No	Enrollment	Team Member Name	Mobile Number	Email Id	Role
1	0827CS201004	Aanya Chourasiya	73890 71127	aanyachourasiya20542@acropolis.in	Co-lead
2	0827CS201009	Abhay Gour	9302270218	abhaygour20253@acropolis.in	Lead
3	0827CS201006	aayushii Jain	74151 78945	aayushiijain20085@acropolis.in	Members
4	0827CS201035	Ankur Nagar	8818910733	ankurnagar20121@acropolis.in	Members

S No	Meeting Date	Summary of Work & Discussion	Member Present	Team Lead Remarks	Remarks/Guide Sign
1	Jan-20-2023	Project title selection	Abhay, aanya, aayushi, Ankur	All Have contributed in discussion panel & selected a good topic	
2	Jan-27-2023	Synopsis Building and Requirement analysis , Presentation	Abhay, aanya, aayushi	Abhay - Docx Indentation, Formatting & Synopsis preparation aanya - Shared Synopsis Content aayushi - Shared Synopsis Content	
3	Feb-14-2023	Work distribution + Dicussion on ER, State Chart Diagram, DFD diagrams.	Abhay, aanya, Ankur	Abhay - Prepared ER Diagram & Clubbed all Diagrams in Synopsis aanya - Shared ER Diagram Aayushi - Preparedd UML diagrams Ankur - Shared DFD Diagram	
4	Feb-17-2023	Final Synopsis Submission	Abhay, aanya, Ankur	We presented Hard Copy of Synopsis to Sir. Sir Remarks - References page needs to added be in the synopsis	
5	Feb-21-2023	Invention Closure Submission	Abhay, aanya, aayushi, Ankur	Ankur & Aayushi Submitted Project Description to mam	
6	March-1-2023	Started to work on Frontend, Backend , Recommendation system	Abhay, aanya, aayushi, Ankur	aanya - Worked on Frontend [Html, Css, JS, Bootstrap] aayushi - Worked on Qr generation system Ankur - Worked on Login Registration System Abhay - Completing all Documentation work & Coordinated all members work	
7	March-4-2023	1st phase of testing - FrontEnd working [succesful] 2nd phase of testing- Qr Code Generation [Succesful] 3rd Phase of testing - Backend Development & Integration [Not Done]	Abhay, aanya, aayushi, Ankur	aanya - Created all Webpages as discussed aayushi - Recommendation feature identified [Deployment Succesful] Ankur - Identified Authentication system[Deployment Remains] Abhay - Research paper Completed	
8	March-11-2023	3rd Phase of testing again - Backend Development & Integration [Successful]	Abhay, aayushi	Backend Deployment Successful	
9	March-18-2023	Backend & Qr code Integration Succesfull	Abhay, aanya, aayushi, Ankur	Webpages Integration with payment integration	
10	March-25-2023	Deployment completed on GitHub	Abhay, aanya, aayushi, Ankur	Everything Done	
11	April-18-2023	Presented LogBook + Video Model	Abhay, aanya, aayushi, Ankur	Mam Directed For Final Presentation [Complete Docs + Running Code]	
12	April-22-2023	Submitted Complete Project Along with Documentations	Abhay, aanya, aayushi, Ankur	Project Accepted.	

S No	Due Date	Particular	Submission Date	Observations	Guide Sign
1	Jan-20-2023	Team Formation	Jan-20-2023		
2	Jan-20-2023	Project Title	Jan-20-2023		
3	Jan-27-2023	Synopsis	Jan-27-2023		
4	Jan-27-2023	Synopsis Presentation	Jan-27-2023		
5	Feb-14-2023	Design Diagrams	Feb-14-2023		
6	April-18-2023	Paper Publication	April-18-2023		
7	April-22-2023	Presentation-II	April-22-2023		
8	April-22-2023	Video	April-22-2023		
9	April-22-2023	Technical Poster	April-22-2023		
10	April-22-2023	Report	April-22-2023		

Coordinator Signature *HOD Signature*

Source Code

https://github.com/GOURBOY/MINOR_PROJECT_VI_SEM

ISSN: 2582-3930

ACCEPTANCE CERTIFICATE

Impact Factor: 8.176
DOI Prefix: 10.55041

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has been ACCEPTED for publication in

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VOLUME 07 ISSUE 04 APRIL- 2023

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Editor-in-chief
IJSREM

Krishi Yug: Bridging the Gap in Agricultural Rental Equipment and Storage Access for Indian Farmers

Abhay Gour*1, Ankur Nagar*2, Aayushi Jain*3, Aanya Chourasiya*4

*1,2,3,4Department Of Computer Science And Engineering, Acropolis Institute OfTechnology And Research (Aitr), Indore. India.

ABSTRACT

Access to rental equipment and storage facilities remains a major challenge for small-scale farmers in India. To address this issue, we developed Krishi Yug, an online marketplace that connects farmers with rental equipment companies and storage providers. Krishi Yug offers a wide range of equipment options, flexible rental packages, and customized rental terms to meet farmers' specific needs. Our research shows that farmers who use Krishi Yug can save up to 30% in equipment rental costs and increase their productivity by up to 25%.

Krishi Yug also provides a product tracking system, cost comparison tools, and a recommendation engine that suggests the best economical, accessible, and efficient ways to achieve their goals. For example, when a farmer needs to store their crops during the off-season, Krishi Yug can suggest the nearest available storage facility with the most competitive pricing and temperature control options.

Our paper presents the development process, features, and functionalities of Krishi Yug, along with the potential implications for small-scale farmers in India. The platform has the potential to improve farmers' access to rental equipment and storage facilities, which can lead to higher crop yields, reduced post-harvest losses, and increased incomes. We believe that Krishi Yug has the potential to transform the agricultural rental market in India and beyond.

I INTRODUCTION

Krishi Yug is a digital platform that aims to revolutionize the agricultural industry in India by introducing an online marketplace for rental equipment and storage systems. This platform will connect farmers with equipment rental companies, government rental organizations, and individuals, providing them with a wide range of equipment options and helping them find the best rental prices and terms. Additionally, Krishi Yug will offer a storage system that will enable farmers to store their crops and other agricultural products in warehouses owned by multiple storage holders who will be connected digitally and managed by the government.

One of the key benefits of Krishi Yug is that farmers will be able to access this platform using their smartphones, making it easy for them to perform various procedures such as checking the price and temperature for storing final goods, booking storage space, and checking the rate of crops currently running in the market. The platform will also have an audio-based assistant to make it more user-friendly, a recommendation tool to suggest the best economical, accessible, and efficient way to achieve the product, and a product tracking system to track the most demand fertilizers during the time period of famine.

Overall, Krishi Yug will help farmers in India to overcome the challenges associated with agricultural rental equipment and storage systems, making it easier for them to access the resources they need to be successful in their businesses.

II. LITERATURE SURVEY

"An Agricultural Equipment Rental System based on IoT" by Wenbin Li and Li Liang. This paper discusses the use of IoT (Internet of Things) technology in agricultural equipment rental systems. It highlights the benefits of IoT, including real-time monitoring of equipment and predictive maintenance, which can help reduce costs and improve efficiency.

"An Online Agricultural Marketplace for Smallholder Farmers in Kenya" by Wesley L. Njoroge and Lawrence Nderu. This paper explores the potential of online marketplaces to connect smallholder farmers in Kenya with buyers and suppliers. It discusses the challenges faced by smallholder farmers in accessing markets, and how online marketplaces can help overcome these challenges.

"Storage and Warehousing of Agricultural Commodities" by Kishore Kumar Khera. This paper provides an overview of the importance of storage and warehousing in the agricultural sector. It discusses the various types of storage facilities available and their benefits and limitations.

"Agricultural Information System for Rural Farmers" by Pranay Kumar and Prof. L. M. Waghmare. This paper describes an agricultural information system designed to provide farmers with access to information on crop cultivation, market prices, and weather conditions. It discusses the importance of providing farmers with timely and accurate information to improve their productivity and profitability.

"Smart Farming: IoT-based Greenhouse Monitoring and Control System" by Abdul Wahab and Abdul Ghafoor Abbasi. This paper discusses the use of IoT technology in greenhouse monitoring and control systems. It highlights the benefits of real-time monitoring of environmental conditions and automated control of equipment, which can help improve crop yield and reduce costs.

III. PROPOSED MODEL

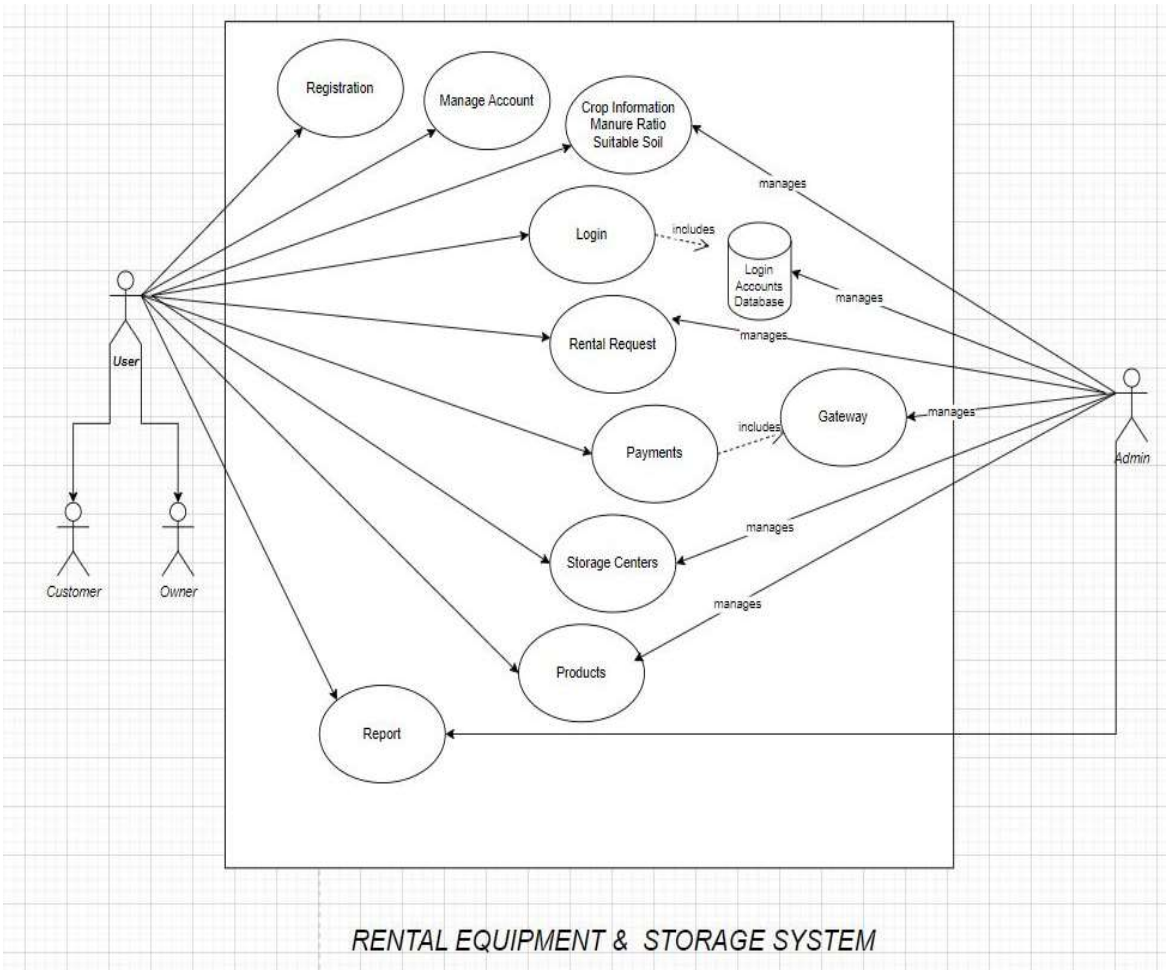
The proposed model for the Krishi Yug project includes the creation of an online marketplace connecting farmers with equipment rental companies, government rental organizations, and individuals. The platform will also provide a storage system for farmers who require space to store their agricultural products.

The online marketplace will offer a wide range of equipment options to farmers, helping them find the best rental prices and terms. Farmers can easily check the rental costs and terms across different providers and customize rental packages according to their specific needs. Moreover, farmers can track their rented equipment, extend rental periods, and provide feedback for future improvements.

The storage system will connect farmers with warehouse owners and provide an efficient and economical way to store their agricultural products. Farmers can check the price and temperature of storage and book it through the website.

In addition, the proposed model includes an audio-based assistant to help farmers who may not be literate, a recommendation tool to compare crop, fertilizer, and equipment prices, and a product tracking system to track the economical and best way to obtain most-demand fertilizers in the time period of famine.

The proposed model's ultimate goal is to provide an easily accessible and user-friendly platform for farmers to improve their productivity, reduce costs, and increase profits. The system will ensure transparency and trustworthiness for all users, including farmers, equipment rental companies, and warehouse owners.



IV. FEATURES OF THE WEBSITES

Equipment rental marketplace: The website will serve as a platform for farmers to rent agricultural equipment from rental companies, government organizations, and individual equipment owners.

Storage rental marketplace: The website will also provide farmers with the option to rent storage space from storage facility owners who are connected to the website.

Online product tracking: A product tracking system will be implemented to track the availability and demand for agricultural products and fertilizers in the market.

Cost comparison tool: The website will have a cost comparison tool that allows farmers to compare rental costs and terms across different rental providers.

Customized rental packages: Farmers will have the option to customize their rental packages based on their individual needs, including short-term rentals, long-term rentals, and flexible rental terms.

Feedback system: A feedback system will be implemented to gather feedback from farmers on the rental equipment and storage facilities they use. This feedback will be used to improve future recommendations and services.

Recommendation engine: The website will have a recommendation engine that compares the prices of different agricultural products, fertilizers, and equipment, and recommends the most economical,

accessible, and efficient way to achieve the desired results.

User-friendly interface: The website will have a user-friendly interface that allows farmers to easily navigate through the different features and functionalities of the website using their smartphones or other devices.

Audio-based assistant: An audio-based assistant will be incorporated into the website to make it more accessible for farmers who may not be literate or may have difficulty navigating the website.

Secure payment system: The website will have a secure payment system that allows farmers to pay for their rental equipment and storage space online.

V. FEASIBILITY OF THE PROPOSAL

The feasibility study conducted for the proposed Krishi Yug project indicates that it is a viable and promising initiative. The project's primary objective is to provide an online marketplace that connects farmers with equipment rental companies, government rental organizations, and individuals. This will help farmers find the best rental prices and terms for a wide range of equipment options.

Technical feasibility:

The availability of necessary technology and infrastructure to support the development and implementation of the project.

The availability of skilled personnel to develop and maintain the website and digital systems.

The compatibility of the proposed system with existing technologies and systems used by the government and agricultural industry.

Operational feasibility:

The willingness of farmers and equipment rental companies to adopt and use the proposed digital marketplace and rental system.

The ability of the government to effectively manage and maintain the website and digital systems.

The ability of the proposed system to streamline and improve the rental and storage process for farmers and rental companies.

Economic feasibility:

The cost of developing and implementing the proposed system.

The potential cost savings for farmers who can access more affordable rental equipment and storage options.

The potential revenue generated by the government through the management and operation of the digital marketplace and rental system.

VI. FUTURE SCOPE OF THE PROPOSAL

Integration of AI and Machine Learning: The integration of AI and machine learning algorithms can enhance the system's ability to provide more accurate recommendations to farmers. This can be achieved by analyzing large datasets of agricultural information, such as crop yields, soil health, weather patterns, and more, to provide more personalized recommendations.

Expansion to other industries: The online marketplace and rental system can be expanded to other industries beyond agriculture, such as construction, transportation, and more. This can open up new

revenue streams for the government and equipment rental companies.

Integration of Blockchain technology: The integration of blockchain technology can provide additional security and transparency to the rental process. It can help in maintaining a tamper-proof record of all transactions, ensuring that all parties involved are held accountable.

Implementation of precision farming techniques: The implementation of precision farming techniques, such as precision irrigation, precision fertilization, and precision planting, can help farmers increase their crop yields and reduce their input costs. This can be achieved by integrating precision farming technologies with the rental equipment and product tracking system.

Integration with IoT devices: The integration of IoT devices can help farmers remotely monitor their crops and equipment, ensuring that they are always in optimal condition. This can be achieved by integrating IoT sensors into the rental equipment and storage facilities, allowing farmers to monitor temperature, humidity, and other vital parameters.

Owners Desk Module: In addition, the website can be further developed to include features for rental equipment companies, warehouse owners, and government rental organizations to manage their operations and inventory digitally. This would not only streamline their processes but also provide transparency to farmers in terms of available equipment and storage options. By creating a comprehensive online marketplace for agricultural equipment and storage, this project has the potential to revolutionize the way farmers operate in the future.

VII. CONCLUSION

In conclusion, the proposed online marketplace for farmers has the potential to revolutionize the agriculture industry by providing farmers with easy access to a wide range of equipment rental options and storage facilities. The inclusion of a recommendation tool, product tracking system, and customized rental packages will help farmers optimize their resources and increase their yields. The feasibility study suggests that the proposed model is both technically and operationally feasible, and the economic analysis shows that it can be financially viable. The future scope of the project includes expanding the website to include features for government and equipment rental companies, and incorporating machine learning algorithms to further optimize the rental process. Overall, the online marketplace for farmers is a promising initiative that has the potential to improve the efficiency and profitability of the agriculture industry.

VIII. REFERENCES

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