Transforming Agriculture with Technology

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Abstract— In India, there are many solutions provided to farmers for their ease in developing the crops and also for selling the crops, but online data warehouse or storage system is not yet provided to them, there are many government websites which the farmers can access and also gets benefits regarding to growing crops and also how to maintain them, but one of the problem is storage which cannot be ignored that is farmers have to search for the warehouse manually by visiting available warehouses in nearby location to find place for grain storage, this consumes a lot of time, efforts and money. If the particular warehouse accommodation is full then farmers have to visit another various warehouse in search of space. So, we came up with the idea of making an online data warehouse management system which will be available to the farmers in the form of website or application, where in the farmers can book the storage space prior according to their need. The features and functionalities that AgriTech will provide are location-based filtering of warehouse, payment portal, forum, alternative crop details, alternative video for storage of grains. The paper further provides you with the proposed system, conclusion and the results for the same.

Keywords: Agriculture, Farmer, Crops, Warehouse, System, Multilingual

I. INTRODUCTION

We did the on-site survey where we visited various warehouses, had a word with farmers and concluded that they are facing some problems for storing the grain, and they need to travel a lot if the warehouse booking is full which ultimately leads to wastage of time and money. So, we came up with the idea of giving an online interface to the farmers, so that they can book the storage space online, get a crop prediction, also a forum where in they can discussion the problems to the various solutions.

Now a day, lots of amount of Agriculture products/grains/goods get waste just by keeping it in own storage for long time. And also, problem faced by the farmers is to store their food grain to the warehouse. They have to wait in long queue to get the storage space in warehouse for their grains. If warehouse gets full then remaining farmers need to search for other warehouse which leads to wastage of time, efforts and money. Another problem faced by farmers to use website is language barrier due to which they are not able to use website or apps. Farmers also faced problems due to climate change. Farmers grow crops but don't get desired production, due to climate change crops are affected. Using our system, they can book space for their goods which can save both time and money of a farmers. Farmers can check availability of space and can directly approach to the nearest warehouse for storage. It will also help the farmers to take decision about which warehouse he should select based on geographical location. System has a super admin to take care about validation on warehouse owner. The application will be a user-friendly application so that the farmer can use it easily

with convenience. The objective of our project is to provide a web-based service of warehouse booking system for crops storage to farmers. Weather Analysis system for predicting crop cultivation which will help the farmers to gain more profit by cultivating that particular crop in that weather condition.

II. PROPOSED SYSTEM

We will make an online web portal where in the farmer will be able to choose desired warehouse based on his location and crop capacity. Once he chooses the warehouse and stores his grain. Along with online warehouse facility we are also giving a weather analysis report to predict the next crop cultivation. The most important aspect is the language barrier so the site will be multilingual, according to their choice farmer can access the site with desired language. Also, informational videos related to storage of grains at small scale without warehouse will be available so that the farmer who cannot afford the cost of warehouse can refer them and store grains remotely. Online forum for discussion with other farmers will also be provided. Our Project is divided in four major modules and we are going to form network of these four different modules for more reliable communication in our system. We have following module which will give an idea about the working of each and its role in our project.

A. Farmer

We are more focusing on the farmer that's why the main user of our system will be a farmer. When Farmer want to use our service then he has to enter the details required to do the registration with Mobile no which will be use as key point of user verification if require. All the entered data will be sent to the server for validating particular user and it will also check whether the user is register or not. It will be check by making request from Web Server to database server which have Registered User Data. After checking from the database, if the user is already registered then the user can access the web application by Login into our system using credentials. If user does not exist in the Register User Database, then data will be store in database and user will be registered. Once user will submit the details user will get OTP for mobile verification using SMS API on the Phone no which they have used for registering. If user submit correct OTP then he will be redirected to the login page where user have to enter the username and password and if credentials match then user will be login and login session will be started. Once farmer will login first time, he must complete the remaining details for enabling warehouse booking service using their location. Location of the user will be sent to the server and the location of the user will be compared with the location of warehouse and result will be sent to the user. Here we can use location API so that appropriate farmer location is sent and results are generated accurate. Farmer will view the warehouses which are nearby to their own location and check out space availability and book them accordingly. Farmer can book and

fill the details of crop and capacity he wants to store. In my booking they can view booked space and the time period for which they have booked the chamber. We are going to provide them crop recommendation according to location. We are going to provide them alternate solution videos for storage if the farmer is not able to pay the rent then he/she can simply watch the video and can make some sort of small storage in their house itself.

B. Warehouse Owner

Warehouse owner has to fill the details will registration including the location. Registration and user verification process will be same as Farmer. Now w-owner can configure the warehouse chambers or add more chamber. W-owner can edit, remove or change status of the chamber. When a user books space in the warehouse w-owner will receive the notification. W-owner can also view the users who have booked the chambers in their warehouse. W-owner can view the transaction history of the warehouse. If w-owner owns multiple warehouses so he/she can add the other warehouse and its details.

C. Super Admin

The super admin will receive the complaints from the farmer and also from the w-owners. Once the complaints are received the super admin will work on it and provide them the perfect solution for the problems they are facing. Super Admin can also accept and reject the valid or invalid profile of warehouse owner. If Super Admin will reject the Warehouse Owner Project then that Warehouse Owner's warehouse will be disable from the system.

D. Intelligent System

Intelligent system will send the notification to all farmer about crop suggestion and weather prediction. Following are module which will supported by Our System.

Multilingual: The system that we have proposed is a multilingual web-based application because farmer don't know English so will make it more reliable and convenient for farmers.

Weather Prediction & Crop Recommendation: We are using Dark Sky API for weather prediction and the obtained weather forecast will be sent to the farmers via SMS by the Super Admin of our website. We have gathered the government datasets available so that we can provide a location-based prediction of crops to the specific farmer based on his location.

Location based filtering & Data Visualization: Location based filtering of warehouse is an important part of farmer module wherein he will be able to search for the desired and location specific warehouse. We are providing the Data Visual Component to all user to helps them to understand the things in a much easier and convenient way

III. RESULTS

Following are the sequence of snapshot that we have achieved in our application:

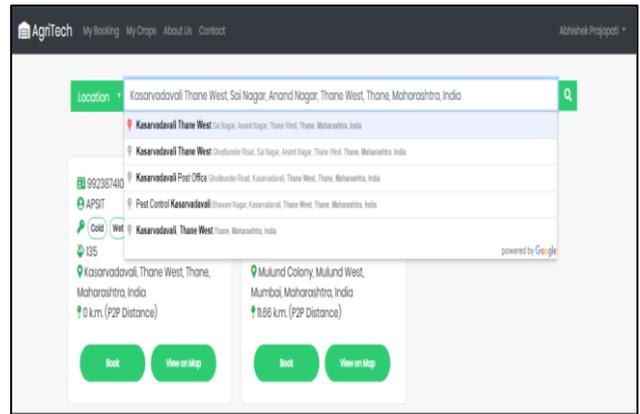### A. Location Based filter for farmer to search desired location

Fig. 5.1: Location based filter for farmer

B. Interface for farmer where he can see his history of booking, he has done.

Fig. 5.2: Booking History of farmers

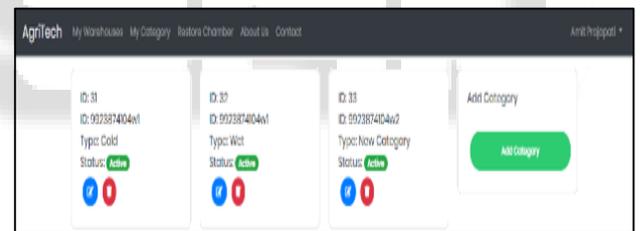### C. Categories of the warehouse that are available for the farmers

Fig. 5.2: Categories of Warehouses

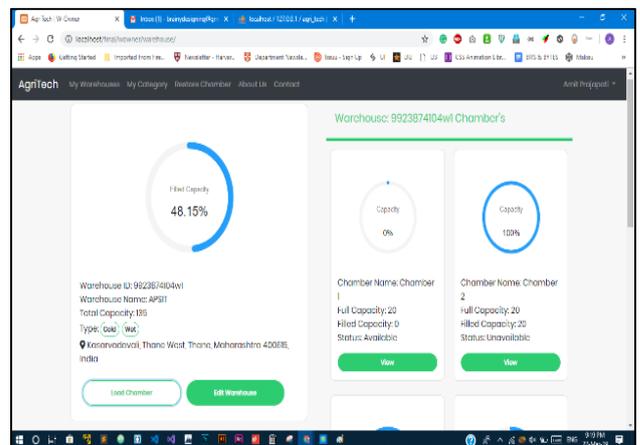### D. Detailed interface of warehouse and its chamber

Fig. 5.3: Warehouse owner chambers detail

E. Super Admin interface which has analytics and details of all users of application.
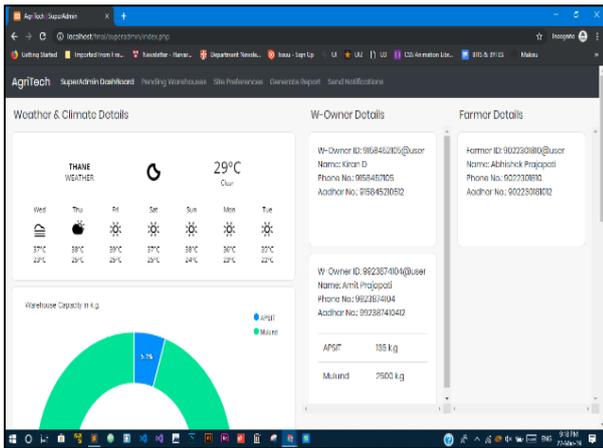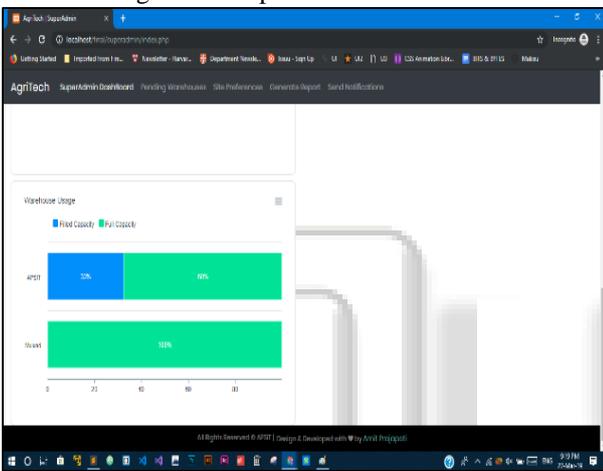

Fig. 5.4.1: Super Admin interface 1

Fig. 5.4.2: Super Admin Interface 2

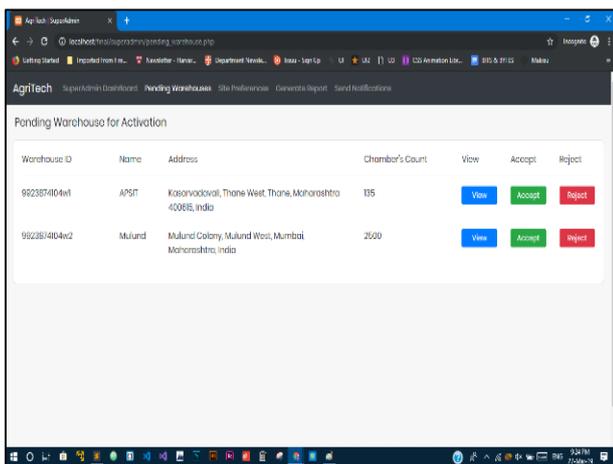*F. Interface of pending notification for activation of warehouse owner*

Fig. 5.5: Pending warehouse interface

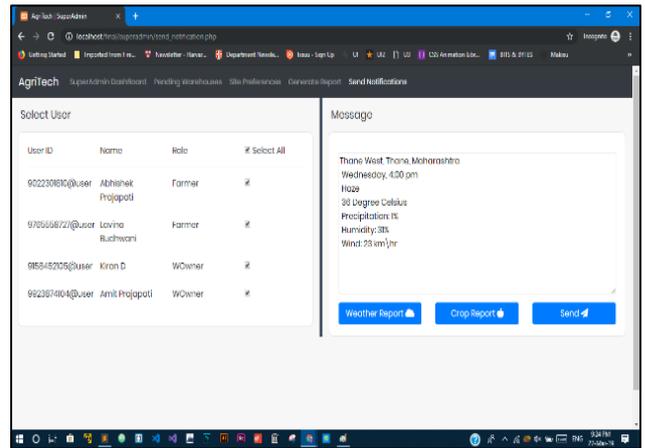*G. Interface of Super Admin for sending notification to all users about weather and crop details.*

Fig. 5.6: Sending Notification
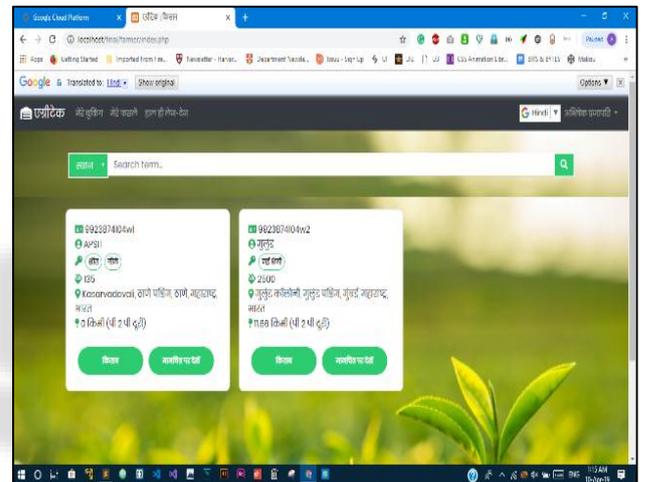
H. Interface of Website in Hindi Language

Fig. 5.7: Multilingual Interface 1
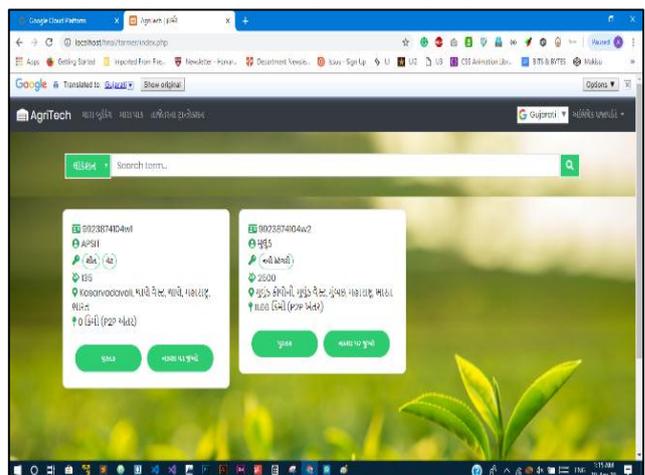
I. Interface of Website in Gujarati Language

Fig. 5.7: Multilingual Interface 2

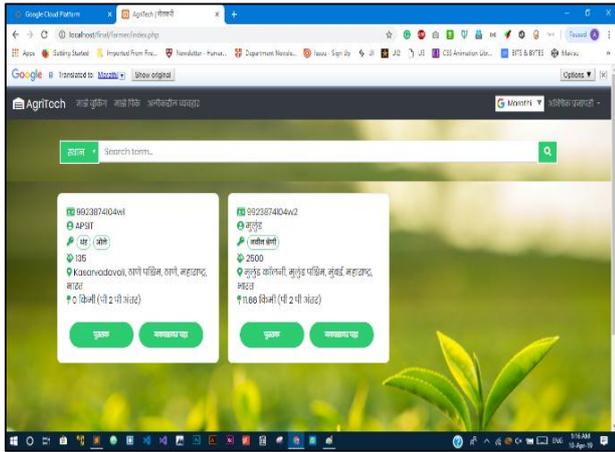**849**

J. Interface of Website in Marathi Language

Fig. 5.7: Multilingual Interface 3

IV. CONCLUSION

Thus, the basic idea of creating an online warehouse system to reduce the time and money of farmers have been achieved by implementation of web-based application which also have location-based filter helps them to book the desired warehouse. Super Admin has the facility to keep the watch on whole system and monitor warehouse owner. Our system thus has three modules which are: farmer, warehouse owner and Super admin. So, we have developed the system which will be beneficial and user friendly and can act as replacement to the existing offline warehouse system.

V. FUTURE SCOPE

The Machine Learning part that we required for giving the suggestion of the weather forecast and crop prediction can be implemented as the future scope of the project. Also, a forum that can be useful for effective communication between the farmers will be beneficial for new farmers as they can post their problems on forum and the experienced farmer can provide a solution for the same, these will ultimately lead to creation of a forum community which is online and helpful.

REFERENCES

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Paper Title	Author	Methodology	Advantage	Future Scope
A Scalable Machine Learning System for Pre-Season Agriculture Yield Forecast [1]	Igor Oliveira, Renato L. F. Cunha, Bruno Silva, Marco A. S. Netto	They have implemented a Deep Neural Network (DNN) as their machine learning model to predict Pre-Season Agriculture Yield Forecast by using algorithms.	This system is a very useful tool for farm management and can help stakeholders to perform critical decisions in their agricultural operations	As here they have implemented ML if more data is given to the system then a better accurate report for farmers would be generated ultimately leading to better decision making by farmers
Cloud Service Oriented Architecture (CSoA) for Agriculture through Internet of Things (IoT) and Big Data [2]	Pamidi Srinivasulu, R Venkat,M. Sarath Babu,K Rajesh	The proposed work provides number of services that includes crop management, marketing, finance, e-commerce, web services via cloud, using various technologies like Big Data, Internet of Things (IoT), Cloud Computing, etc	They provide service like crop management, marketing, finance management, e-commerce,web services through cloud etc. which also will reduce the unemployment problem in the youth.It also makes agriculture not only a profession for living but also a profitable sector in the	To familiarize this modern smart agriculture to the farmers and implementation by the farmers. If this system implemented by the farmers,then the economy of the people and country will be improved

			globe which further enhances the GDP	
Crop and Yield Prediction Model [3]	Shreya S. Bhanose Kalyani A. Bogawar Aarti G. Dhotre Bhagyashree R. Gaidhani	They have proposed a system that uses data mining algorithm like k-Means, k- Means++ and traditional k-Means for crop and disease prediction as well as predict crop water requirement.	By Modifying the cluster algorithm, they have improved the accuracy of a system as it achieves the high-quality clusters duet initial cluster centric selection.	Future scope is to consider geographical area using world geographical information system for global harvest prediction system
Crop Recommendation System for Precision Agriculture [4]	S.Pudumala, E.Ramanujam,R.Harine Rajashreeń, C.Kavyań, T.Kiruthikań, J.Nishań	They have use research data of soil characteristics, soil types, crop yield data collection and suggests the farmers the right crop based on their site-specific parameters leading to increase in productivity.	This system reduces the wrong choice on a crop and increase in productivity	Future work is aimed at an improved data set with large number of attributes and also implements yield prediction
Crop Prediction System using Machine Learning [5]	Prof. D.S. Zingade, Omkar Buchade, Nilesh Mehta,Shubham Ghodekar, Chandan Mehta	The proposed project will integrate the data obtained from repository, weather department and by applying machine learning algorithm: Multiple Linear Regression, a prediction of most suitable crops according to current environmental conditions is made.	This provides a farmer with variety of options of crops that can be cultivated. Thus, the project develops a system by integrating data from various sources, data analytics, prediction analysis which can improve crop yield productivity and increase the profit margins of farmer helping them over a longer run	In the future, all farming devices can be connected over the internet using IOT. The sensors can be employed in farm which will collect the information about the current farm conditions and devices can increase the moisture, acidity, etc. accordingly.

Table 1: Comprehensive Analysis for Transforming Agriculture with Technology