

A Synopsis on

# **Smart Warehouse Management System for Agricultural Products**

Submitted in partial fulfillment of the requirements  
of the degree of

**Bachelor of Engineering**

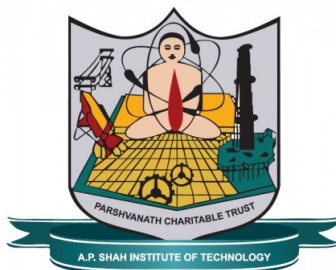
in

**Information Technology**

by

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## CERTIFICATE

This is to certify that the project Synopsis entitled “*Smart Warehouse Management System For Agricultural Products*” Submitted by “*Amit Prajapati (15104014), Amisha Karia (15104008), DhruvKumar Patel (15104026) & Lavina Budhwani (16204019)*” for the partial fulfillment of the requirement for award of a degree *Bachelor of Engineering* in *Information Technology* to the University of Mumbai, is a bonafide work carried out during academic year 2018-2019

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## Declaration

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

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# **Abstract**

In India, due to lack of online warehouse storage facility, Indian farmers are facing lot of problems such as they need to wait in the long queue to get the space in warehouse for storing their grains, if the warehouse accommodation is full then they need to visit various warehouse in search of space which ultimately waste their time and efforts. The basic idea behind our project is to give an online web based application to the farmers so that he can get the storage space faster without much wasting of time, money and efforts. Our system will also give a notification to the farmer regarding the expiry of stored goods in particular warehouse according to their lifespan. Our system will be a multilingual for understanding of farmers. We will also provide them with informational videos regarding how to store grains at small scale if they cannot afford the price of warehouse. Along with that we are also providing a forum facility for discussion with other farmers.

## **Introduction**

It is a web based application that will allow the farmers to store their crops in a warehouse. 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. Our system will also help the farmers to take decision about which warehouse he should select based on the passed data analysis and geographical location using Machine Learning. We are providing a forum wherein farmers can discuss their problems and get their solution which will lead to formation of a farmers community. Our system has a super admin to take care about validation on warehouse owner also a particular farmer. Our application will be a user friendly application so that the farmer can use it easily with convenience.

## **Objectives**

The objective of our project is to provide an application or a web based service of warehouse booking system for crops storage to farmers. Using our system they can book warehouse space for their goods which can save both time and money of a farmers. Farmers can check availability of warehouse space and can directly approach to the nearest warehouse for storage. Also a site which is multilingual and will provide a forum to discuss various problems amongst the farmers is also the objective. 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.

# Literature Review

After analyzing some paper given below is the literature survey of each paper

## 1st Paper Title:

“A Scalable Machine Learning System for Pre-Season Agriculture Yield Forecast. Igor Oliveira, Renato L. F. Cunha, Bruno Silva, Marco A. S. Netto

### Proposed System:

They have implemented a Deep Neural Network (DNN) using machine learning model to predict Pre-Season Agriculture Yield Forecast by using algorithms.

### Advantages:

This system is a very useful tool for farm management and can help stakeholders to perform critical decisions in their agricultural operations.

### Future Scope:

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.

## 2nd Paper Title:

“Cloud Service Oriented Architecture (CSOA) for Agriculture through Internet of Things (IoT) and Big Data”, Pamidi Srinivasulu, R Venkat,M. Sarath Babu, K Rajesh

### Proposed System:

The proposed work which makes use of various technologies like Big Data, Internet of Things (IoT), Cloud Computing, etc is going to be a big boon to the farmer who otherwise is made to undergo a tough time in view of lack of the technology that he/she should have been adapted by this time.

### Advantages:

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 globe which further enhances the GDP.

**Future Scope:**

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.

**3rd Paper Title:**

“Crop and Yield Prediction Model”, Shreya S. Bhanose, Kalyani A. Bogawar, Aarti G. Dhotre, Bhagyashree R. Gaidhani

**Proposed System:**

They have use data mining algorithm like k-Means, k- Means++ and traditional k-Means for crop and disease prediction as well as predict crop water requirement.

**Advantages:**

By Modifying the cluster algorithm they have improve the accuracy of a system as it achieves the high quality clusters duet initial cluster centric selection.

**Disadvantages:**

In this proposed, they have to change existing algorithm like K-mean clustering algorithm because Traditional clustering algorithms such as k-Means, improved rough k-Means and means++ makes the tasks complicated due to random selection of initial cluster center and decision of number of clusters.

**Future Scope:**

Future scope is to consider geographical area using world geographical information system for global harvest prediction system.

**4th Paper Title:**

“Crop Recommendation System for Precision Agriculture”, S.Pudumala, E.Ramanujam, R.Harine Rajashree, C.Kavya, T.Kiruthika, J.Nisha.

**Proposed System:**

Precision agriculture is a modern farming technique that 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.

**Advantages:**

This system reduces the wrong choice on a crop and increase in productivity.

**Future Scope:**

Future work is aimed at an improved data set with large number of attributes and also implements yield prediction.

**5th Paper Title:**

“Crop Recommendation System for Precision Agriculture”, Prof. D.S. Zingade, Omkar Buchade, Nilesh Mehta, Shubham Ghodekar, Chandan Mehta

**Proposed System:**

The proposed project provides a solution for Smart Agriculture by monitoring the agricultural field which can assist the farmers in increasing productivity to a great extent. Weather forecast data obtained from IMD (Indian Meteorological Department) such as temperature and rainfall and soil parameters repository gives insight into which crops are suitable to be cultivated in a particular area. This work presents a system, in form of an android based application, which uses data analytics techniques in order to predict the most profitable crop in the current weather and soil conditions. The proposed system 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.

**Advantages:**

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.

**Future Scope:**

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. The vehicles used in farm like tractor will be connected to internet in future which will, in real time pass data to farmer about crop harvesting and the disease crops may be suffering from thus helping the farmer in taking appropriate action. Further the best profitable crop can also be found in light of the monetary and inflation ratio

**Problem Definition**

Now a days, 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 lines 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 problems 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 dont get desired production, due to climate change crops are affected.

So we have propose the solution which will solve all the above problems. 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 he will get notification regarding the expiry of the stored grains in warehouse. 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.

## Proposed System Architecture Working

Our Project is divide in four major module and we are going to form network of these four different module for more reliable communication in our system. We have following module:

1. Farmer
2. W-Owner
3. Super-Admin
4. Intelligent System

- **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 Aadhar 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 the response from the database server 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 to web application. After entering the OTP our system will validate the OTP if user submit correct OTP then he will be redirected to the login page where user have to enter the username and password. When user will click on the login button username and password will be sent to the server for verification. If the login parameter will matches with the Register User Data present in database 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 send 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 there own location and check out space availability and book them accordingly.After finalising ever aspect he requeries,he will then click the book button for the warehouse which he wishes to book.Once selected a plot for booking the user have to pay certain token amount within a particular period of time or else the system will revoke the booking of that slot for payment usr will be directed to the payment portal. When a token amount is paid by user ,she/he will now allotted the chambers in the warehouse.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 the weather analysis.We are going to collect the data for weather analysis and then store it to our website and according to the weather we will recommend farmers for the crop cultivation.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 there house itself.

- **Warehouse Owner**

Owner have to enter the details required to do the registration and also have to fill the Aadhar detail. It is mandatory while filling the details the owner has to provide the location. Once the warehouse-owner have entered the details then it will be sent to the server for checking that the particular user is valid owner and also not a registered owner and that server will be handled by the super admin. If the w-owner is already registered then the w-owner will receive a prompt that the w-owner is already existing.If w-owner does not exist then w-owner will be registered and w-owner will receive an OTP on their entered mobile number.

Now w-owner will enter the no of chambers and the capacity of chambers. 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.

- **Super Admin**

The super admin has all the rights to control the farmer and the w-owner. 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. The super admin is going to provide the analysis report to the owner and the farmer once the analysis is provided to them they are going to get the notification. As the weather analysis report is generated it is going to be sent to the higher authorities for the verification i.e the report is sent to the government.once it is verified then it is going to be displayed on the website also if the report include some important notice that will be sent to all the website users via a notification using ML

system. The super admin is going to generate the survey report.

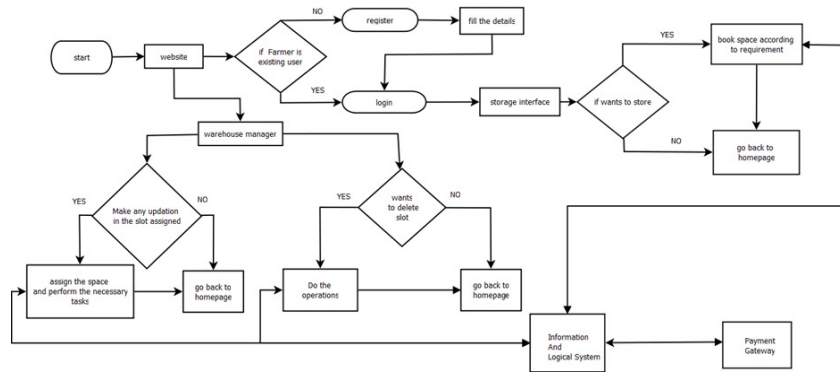


Figure 1: Block Diagram of Smart Warehouse Management System for Agricultural Products

- **Intelligent System: Heart of Warehouse Management System**

Intelligent System is center point of Our Warehouse Management System. Intelligent System consist of Machine Learning engine will calculation and will take all parameter such as location of user using Location API, data set of Crop and Grain, data set of weather API. All this data set will be compute by Intelligent System and it will build a prediction system will be use to will do future Predication of Crop based on Location and Weather condition.

Intelligent system will also send the notification to all farmer about crop suggestion and weather prediction. System will also generate auto report whenever SuperAdmin will click on Generate report button, all the analysis will be summarize and visualize for understability for higher authority where SuperADmin will send the report for verification. This all functionality is very much important and Intelligent system will perform all this activities that why we called it as Heart of WareHouse Management System

## Summary

- Research

Research on working of warehouse: we have found that warehouse has chambers. Every chambers have their name and farmers are allotted the chambers according to their requirement.

- SRS Document preparation

We have created SRS document based on our research and the IEEE Standard format provided by our guides. It includes each and every point as specified in the Standard format template.

- Analysis of Technology Stack

Analyzing various technologies that can help us to build a user friendly and a strong processing application.

- Prototyping

Proper designing of how actually our application will look to the end user. It includes each and every feature that will be present in the application. There are three main users i.e farmer, warehouse owner and super admin, and how is their flow w.r.t our site is designed here and also shown using Use case Diagram.

## References

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