

PREDICTION OF CROP YIELD USING MACHINE LEARNING

Submitted in partial fulfillment of the requirements for
the award of
Bachelor of Engineering degree in Computer Science and Engineering

by

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SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
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MARCH - 2021



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this project report is the bonafide work of **SOMA ROSHINI**
(Reg. No. 37110727) and **P.SAI SRAVANTHI** (Reg. No.37110732) who
carried out the project entitled "**FERTILIZER VALUE UPDATION TO**
FARMERS" under my supervision from **August 2020** to **March 2021**.

Internal Guide

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Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

I **SOMA ROSHINI** and **P.SAI SRAVANTHI** hereby declare that the Project Report entitled “**FERTILIZER VALUE UPDATION TO FARMERS**” is done by me under the guidance of **M.S.ROOBINI,M.E.,Ph.d.**, Department of Computer Science andEngineering at Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

DATE:

PLACE: CHENNAI

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T. Sasikala, M.E., Ph.D., Dean, School of Computing, Dr. S. Vigneswari, M.E., Ph.D., and Dr. L. Lakshmanan, M.E., Ph.D., Heads of the Department** of Computer Science and Engineering for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **M.S.ROOBINI,M.E.,Ph.d., M.E., Assistant Professor**, for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Computer Science and Engineering** who were helpful in many ways for the completion of the project.

ABSTRACT

Fertilizer value updation has a positive practical significance for guiding agricultural production and for notifying the change in market rate of fertilizer to the farmer. In this project the data analysis technology is used to update the rate change through notification. The notifications are send immediately when the rate of the fertilizer is changed in the market. Different types of land condition. So the quality of the fertilizers are identified using ranking process. By this process the rate of the low quality and high quality fertilizer is also notified. The usage of ensemble of classifiers paves a path way to make a better decision on predictions due to the usage of multiple classifiers. Further, a ranking process is applied for decision making in order to select the classifiers results. This system is used to predict the cost of the fertilizers for further.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In the world of developing technologies, the success of sharing information will help the agriculturists in realizing and developing their potential. The information sharing is that the valuable and timely information is being shared between agriculturists, either formally or informally. The willingness of information sharing refers to the open attitude among agriculturists. This open attitude determines the degree and scope of information sharing. Using web-technologies like html and css we build the web application.

We create dataset by gathering data from multiple resources and place them in place which is used to predict the price of the fertilizers and results are subjected to non-linear test later priorities are set and rankings are given to the list of fertilizers. Place information in our application and share that information to agriculturists whose data is collected and stored in the mysql server. we software to automatically send the updated information to the agriculturists in the form of text message.so that agriculturists no need to go to near by towns and cities to know the updated information. We will be machine learning algorithms to predict the price of the fertilizers for the next two months. For prediction purpose we will be using Support vector machine(SVM), Naïve Baye's (NB) and K-Nearest Neighbour(KNN) algorithms to predict the cost of the fertilizers for the further usage of the agriculturists. Further, a ranking process is applied for decision making in order to select the classifiers results. A **crop** is a plant or animal product that can be grown and harvested extensively for profit or subsistence. **Crops** may refer either to the harvested parts or to the harvest in a more refined state. ... Important non-food **crops** include horticulture, floriculture and industrial **crops**. The computational and data

demands of structural price forecasting generally far exceed than what is routinely available in developing countries. Consequently, researchers often rely on parsimonious representations of price processes for their forecasting needs. Contemporary parsimonious form of price forecasting relies heavily on time series modelling. In time series modelling, past observations of the same variable are collected and analyzed to develop a model describing the underlying relationship. During the past few decades, much effort has been devoted to the development and improvement of time series forecasting models. Time series modelling requires less onerous data input for regular and up-to date price forecasting. Hence there is a need for better classification which would be an ensemble or hybrid classification model.

BACKGROUND

This paper communicates the idea regarding the making of Agro Nutri an android application that helps in conveying the harvest particular fertilizer amount to be applied. The idea is to calculate the measure of NPK composts to be applied depend on the blanked proposal of the crop of interest. This application works depend on the product chosen by the farmer and that is taken as input, thus providing the farmers. The future scope of the Agro Nutri is that GPRS can be included so that according to location nutrients are suggested. Further this application would be incorporated as a piece of the accuracy agriculture wherein sensors can be utilized to discover the measure of NPK present in the dirt and that sum can be deducted from the suggestion and giving us the exact measure of supplements to be added. Agriculture is a field that has been lacking from adaption of technologies and their advancements. Indian agriculturists should be up to the mark with the universal procedures. Machine learning is a native concept that can be applied to every field on all inputs and

outputs. It has effectively settled its ability over ordinary calculations of software engineering and measurements.

THE PURPOSE OF WEBSITE

Machine learning calculations have improved the exactness of artificial intelligence machines including sensor based frameworks utilized in accuracy farming. This paper has evaluated the different uses of machine learning in the farming area. It additionally gives a knowledge into the inconveniences looked by Indian farmers and how they can be resolved using these procedures. A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

- Convey information about past activities, current status or projections
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components.

CHAPTER 2

AIM AND SCOPE

AIM OF THE PROJECT

The primary aim of the proposed system i.e. (fertilizer value updation to farmer) india being an agriculture country, its economy predominantly depends on agriculture yield growth and agriculture industry products, Data mining is an emerging research field in the agriculture. Any farmer is interested in knowing how much yield he is about to expect. Analyze the various related attributes like location, pH value from which alkalinity of the soil is determined. Along with it, percentage of nutrients like nitrogen (N), phosphorous (P), and potassium (K) Location is used along with the use of third part application.

OBJECTIVE

Data set collection from various sources and the data parsing and cleansing technique is applied to make the raw data into processing data. The data collected is subject to machine learning system along with run time analysis makes an efficient fertilizer value updation system. Usage of ensemble of classifiers makes the model more robust and efficient. Ranking technique used in the project helps us to make efficient decisions. Creating a web application for user registrations and collection of data. The usage of software suggested the users in SMS format.

SCOPE

In time series modelling, past observations of the same variable are collected and analyzed to develop a model describing the underlying relationship. During the past few decades, much effort has been devoted to the development and improvement of time series forecasting models. Time series modelling requires less onerous data input for regular and up-to date price forecasting.

ADVANTAGES

- Useful to people far away from towns/cities.
- Better time efficiency.
- Reduction of repeated work.

SIGNIFICANCE

To keep up nutrition levels in the soil in case of deficiency, fertilizers are added to soil. The standard issue existing among the Indian agriculturists choose approximate amount of fertilizers and add them manually. Excess or deficient extension of fertilizers can harm the plants life and reduce the yield. This paper gives overview of various data mining frameworks used on cultivating soil dataset for fertilizer recommendation. Agriculture is the most critical application area especially in the developing nations like India .Use of information technology in agriculture can change the situation of decision making and farmers can yield in better way. Data mining plays a important role in decision making on several aspects with agriculture field. It examines about role of data mining in the farming field and their related work by a few authors in related to agriculture domain. It additionally talks about on various data mining applications in taking care of the several agriculture problems. This paper integrates the work of several authors in a single place so it is valuable for specialists to get data of current situation of data mining systems and applications in context to farming field. This paper communicates the idea regarding the making of AgroNutri an android application that helps in conveying the harvest particular fertilizer amount to be applied. The idea is to calculate the measure of NPK composts to be applied depend on the blanked proposal of the crop of interest. This application works depend on the product chosen by the farmer and that is taken as input, thus providing the farmers. The future scope of the AgroNutri is that GPRS can be included so that according to

location nutrients are suggested. Further this application would be incorporated as a piece of the accuracy agriculture wherein sensors can be utilized to discover the measure of NPK present in the dirt and that sum can be deducted from the suggestion and giving us the exact measure of supplements to be added. Throughout the following decades humanity will request more food from less land and water assets. This investigation evaluates the food production effects of four elective advancement situations from the Millennium Ecosystem Assessment and the Special Report on Emission Scenarios. partially and jointly considered are land and water supply impacts from population development, and specialized change, and forests and agriculture demand request shifts from population development and economic improvement. The income impacts on nourishment request are registered with dynamic flexibilities. Worldwide farming area increments by up to 14% somewhere in the range of 2010 and 2030. Deforestation restrictions strongly impact the price of land and water resources but have little consequences for the global level of food production and food prices. While projected income changes have the highest partial impact on per capita food consumption levels, population growth leads to the highest increase in total food production. The impact of technical change is amplified or mitigated by adaptations of land management intensities. Various past occasions joined with generally innovative advancement in different fields have unequivocally added to the development of farming framework demonstrating, including improvement of process-based bio-physical models of yields and domesticated animals, factual models dependent on verifiable perceptions, and financial streamlining and reproduction models at family unit and local to worldwide scales.

CHAPTER 3

SYSTEM DESIGN AND METHODOLOGY

REQUIREMENT OF THE SYSTEM

SOFTWARE REQUIREMENTS

- Operating System - Windows XP
- Coding language - Java
- IDE - Net beans
- Database - MYSQL

HARDWARE REQUIREMENTS

- System - Pentium-IV
- Speed - 2.4GHZ
- Hard disk - 40GB
- Monitor - 15VGA color
- RAM - 512MB

SYSTEM DESIGN

INTRODUCTION

Requirement analysis, also called requirement engineering, is the process of determining user expectations for a new modified product. It encompasses the tasks that determine the need for analysing, documenting, validating and managing software or system requirements. The requirements should be documentable, actionable, measurable, testable and traceable related to identified business needs or opportunities and define to a level of detail, sufficient for system design. It is a technical specification requirement for the software products. It is the

first step in the requirement analysis process which lists the requirements of particular software systems including functional, performance and security requirements. The function of the system depends mainly on the quality hardware used to run the software with given functionality. It specifies how easy the system must be use. It is easy to ask queries in any format which is short or long, porter stemming algorithm stimulates the desired response for user. It refers to a program that performs well not only under ordinary conditions but also under unusual conditions. It is the ability of the user to cope with errors for irrelevant queries during execution. The state of providing protected access to resource is security. The system provides good security and unauthorized users cannot access the system there by providing high security.

MODULE DESCRIPTION

- USER LOGIN
- REGISTRATION
- CALCULATE FERTILIZER VALUE
- SMS SEND TO FARMERS

USER LOGIN

This is the first activity, User needs to provide a correct contact number and a password, which user enters while registering, in order to login into the webpage. If information provided by the user matches with the data in the database table then user successfully login into the webpage else message of login failed is displayed and user need to re-enter correct information. A link to the register activity is also provided for registration of new users.

REGISTRATION

A new user who wants to access the website needs to register first before login. By clicking on register button in login activity, the register

activity gets open. A new user registers by entering full name, password and contact number. A user needs to enter password again in confirm password textbox for confirmation. When user enters the information in all textboxes, on the click of register button, the data is transferred to database and user is directed to login activity again. Registered user then needs to login in order to access the webpage. Validations are applied on all the textboxes for proper functioning of the webpage. Like information in each textbox is must that is each textbox, either it is of name, contact, password or confirm password, will not be empty while registering. If any such textbox is empty webpage will give message of information is must in each textbox. Also data in password and confirm password fields must match for successful registration. Another validation is contact number must be valid one that is of 10 digits. If any such validation is violated then registration will be unsuccessful and then user needs to register again. Message that webpage will display when one of the field is empty. If all such information is correct user will be directed to login activity for login into the webpage.

CALCULATE FERTILIZER VALUE

In this project, Fertilizer value calculated by quality of the fertilizers are identified using ranking process. By this process the rate of the low quality and high quality fertilizer is also notified.

SMS SEND TO FARMERS

In this project the data analysis technology is used to update the rate change through notification. The notifications are send immediately when the rate of the fertilizer is changed in the market. Different types of land condition.

SYSTEM ANALYSIS

INTRODUCTION

Requirement analysis, also called requirement engineering, is the process of determining user expectations for a new modified product. It encompasses the tasks that determine the need for analysing, documenting, validating and managing software or system requirements. The requirements should be documentable, actionable, measurable, testable and traceable related to identified business needs or opportunities and define to a level of detail, sufficient for system design.

FUNCTIONAL REQUIREMENTS

It is a technical specification requirement for the software products. It is the first step in the requirement analysis process which lists the requirements of particular software systems including functional, performance and security requirements. The function of the system depends mainly on the quality hardware used to run the software with given functionality.

USABILITY

It specifies how easy the system must be use. It is easy to ask queries in any format which is short or long, porter stemming algorithm stimulates the desired response for user.

ROBUSTNESS

It refers to a program that performs well not only under ordinary conditions but also under unusual conditions. It is the ability of the user to cope with errors for irrelevant queries during execution.

SECURITY

The state of providing protected access to resource is security. The system provides good security and unauthorized users cannot access the system there by providing high security.

RELIABILITY

It is the probability of how often the software fails. The measurement is often expressed in MTBF (Mean Time Between Failures). The requirement is needed in order to ensure that the processes work correctly and completely without being aborted. It can handle any load and survive and survive and even capable of working around any failure.

COMPATIBILITY

It is supported by version above all web browsers. Using any web servers like localhost makes the system real-time experience.

FLEXIBILITY

The flexibility of the project is provided in such a way that it has the ability to run on different environments being executed by different users.

SAFETY

Safety is a measure taken to prevent trouble. Every query is processed in a secured manner without letting others to know one's personal information.

SYSTEM DESIGN

EXISTING SYSTEM

The computational and data demands of structural price forecasting generally far exceed than what is routinely available in developing countries. Consequently, researchers often rely on parsimonious representations of price processes for their forecasting needs. Contemporary parsimonious form of price forecasting relies heavily on time series modelling. In time series modelling, past observations of the same variable are collected and analyzed to develop a model describing the underlying relationship. During the past few decades, much effort has been devoted to the development and improvement of time series forecasting models. Time series modelling

requires less onerous data input for regular and up-to date price forecasting. Hence there is a need for better classification which would be an ensemble or hybrid classification model.

SYSTEM CABABLITIES

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy.

CHAPTER 4

SOFTWARE DEVELOPMENT METHODOLOGY

DESCRIPTION OF DIAGRAM

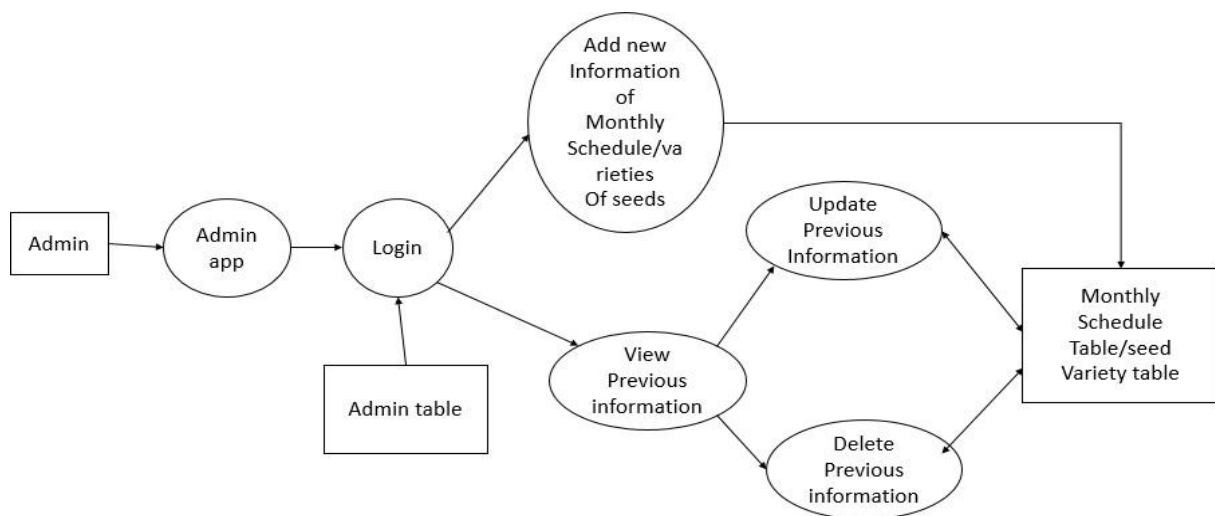


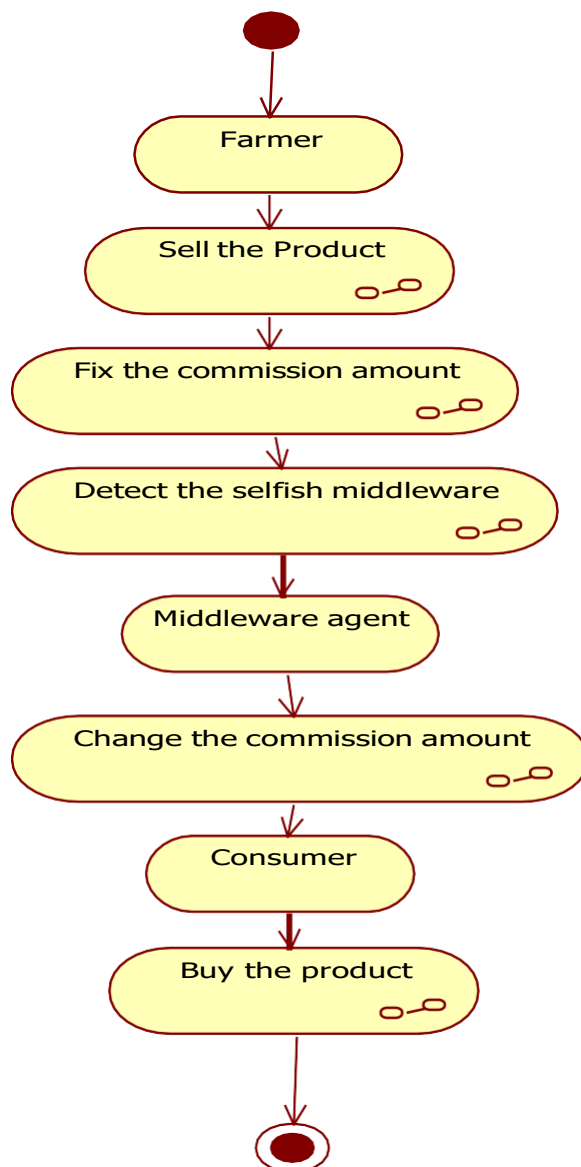
FIG 4.1: DATA FLOW DIAGRAM

In the Fig 4.1 the knowledge provided to and received from the “fertilizer value updation to farmes” UML is simply anther graphical representation of a common semantic model. UML provides a comprehensive notation for the full lifecycle of object-oriented development. To represent complete systems (instead of only the software portion) using object oriented concepts

- To establish an explicit coupling between concepts and executable code
- To take into account the scaling factors that are inherent to complex and critical systems

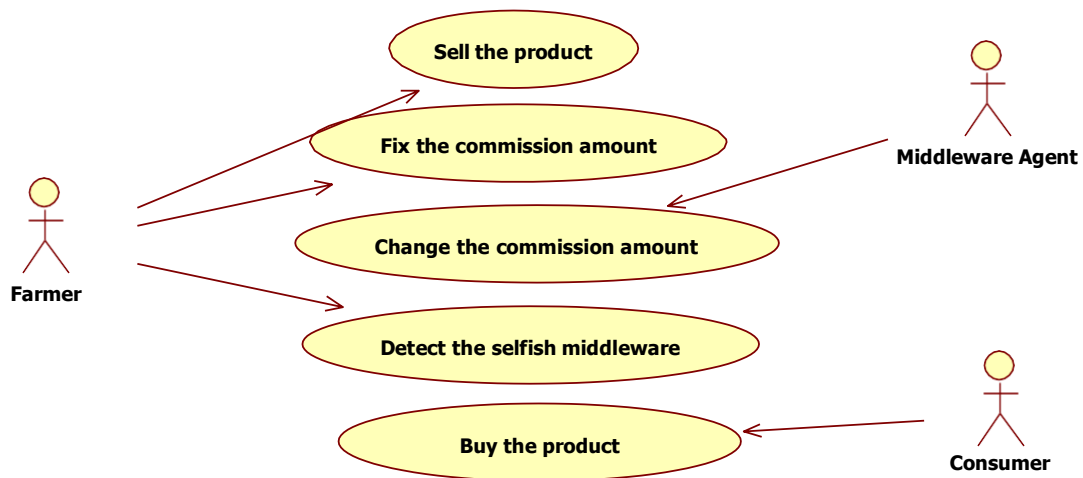
ACTIVITY DIAGRAM

To creating a modeling language usable by both humans and machines. graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. The activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. Activity diagram consist of Initial node, activity final node and activities in between. **ACT44**



ACTIVITY DIAGRAM

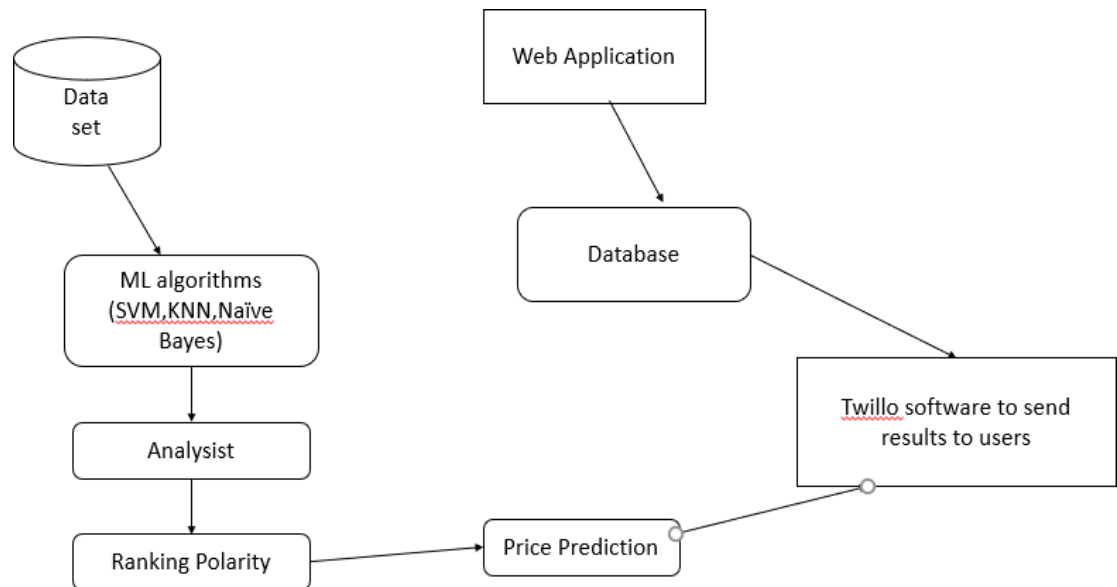
SEQUENCY DIAGRAM



SEQUENCY DIAGRAM

The overview the usage requirement for system. They are useful for presentations to management and/or project stakeholders, but for actual development you will find that use cases provide significantly more value because they describe “the meant” of the actual requirements. A use case describes a sequence of action that provides something of measurable value to an action and is drawn as a horizontal ellipse. Sequence diagram model the flow of logic within your system in a visual manner, enabling you both to document and validate your logic, and commonly used for both analysis and design purpose. Sequence diagram are the most popular UML artifact for dynamic modeling, which focuses on identifying the behavior within your system.

ARCHITECTURAL DESIGN



ACTIVITY DIAGRAM

The data analysis technology is used to update the rate change through notification. The notifications are send immediately when the rate of the fertilizer is changed in the market. Different types of land condition. So the quality of the fertilizers are identified using ranking process. By this process the rate of the low quality and high quality fertilizer is also notified. The usage of ensemble of classifiers paves a path way to make a better decision on predictions due to the usage of multiple classifiers. Further, a ranking process is applied for decision making in order to select the classifiers results. This system is used to predict the cost of the fertilizers for further. This project uses Ensemble of classifiers such as SVM, NAÏVE BAYES, KNN or hybrid classifier. In addition, this project uses Ranking technique.

ALGORITHMS USED

- **SVM (SUPPORT VECTOR MACHINE)**
- **KNN (K-NEAREST NEIGHBORS)**
- **NAÏVE BAYES**

SVM ALGORITHM(SUPPORT VECTOR MACHINE)

- For a dataset consisting of features set and labels set, an SVM classifier builds a model to predict classes for new examples. It assigns new example/data points to one of the classes. If there are only 2 classes then it can be called as a Binary SVM Classifier.
- There are 2 kinds of SVM classifiers:
- Linear SVM Classifier
- Non-Linear SVM Classifier

SVM Linear Classifier:

- In the linear classifier model, we assumed that training examples plotted in space. These data points are expected to be separated by an apparent gap. It predicts a straight hyperplane dividing 2 classes. The primary focus while drawing the hyperplane is on maximizing the distance from hyperplane to the nearest data point of either class. The drawn hyperplane called as a maximum-margin hyperplane.

SVM Non-Linear Classifier:

- In the real world, our dataset is generally dispersed up to some extent. To solve this problem separation of data into different classes on the basis of a straight linear hyperplane can't be considered a good choice. For this Vapnik suggested creating Non-Linear Classifiers by applying the kernel trick to maximum-margin

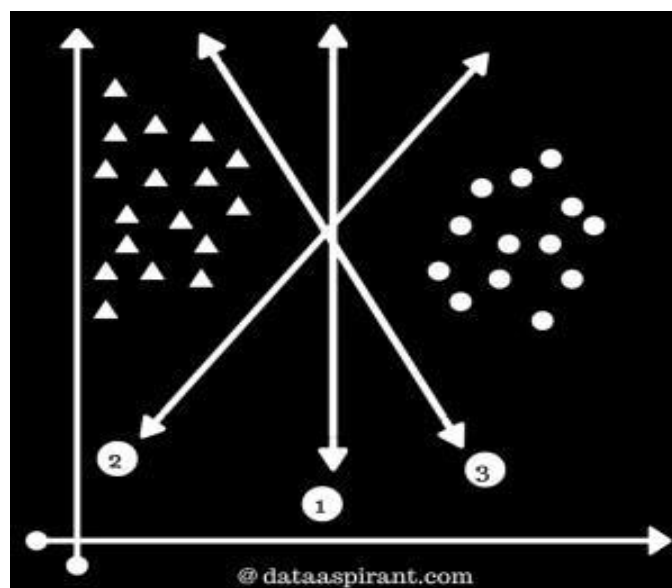
hyperplanes. In Non-Linear SVM Classification, data points plotted in a higher dimensional space.

Examples of SVM boundaries

- In this section, we will learn about selecting best hyperplane for our classification. We will show data from 2 classes. The classes represented by triangle and circle.

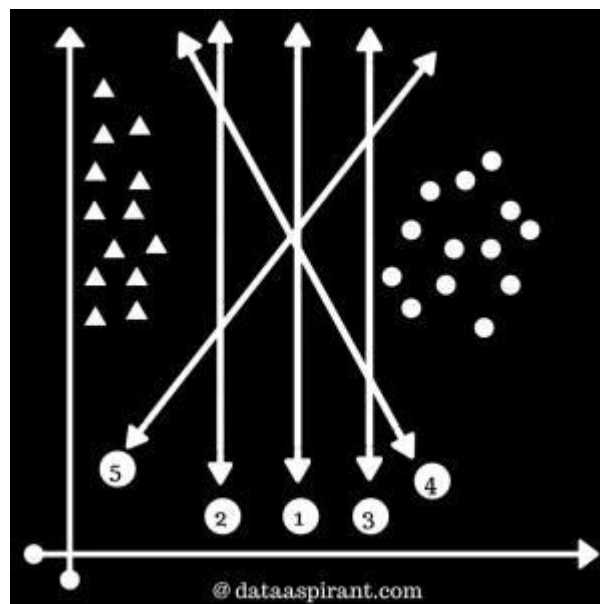
Case 1:

- Consider the case in Fig 2, with data from 2 different classes. Now, we wish to find the best hyperplane which can separate the two classes.
- Please check Fig 1. on the right to find which hyperplane best suit this use case. In SVM, we try to maximize the distance between hyperplane & nearest data point. This is known as margin.
- Since 1st decision boundary is maximizing the distance between classes on left and right. So, our maximum margin hyperplane will be “1st “.



Case 2:

- Consider the case in Fig 2, with data from 2 different classes. Now, we wish to find the best hyperplane which can separate the two classes.
- As data of each class is distributed either on left or right. Our motive is to select hyperplane which can separate the classes with maximum margin.
- In this case, all the decision boundaries are separating classes but only 1st decision boundary is showing maximum margin between $\blacktriangle$ & $\bullet$.



K-NEAREST NEIGHBOR (KNN) CLASSIFICATION METHOD

K-NN is a type of instance-based learning, or lazy learning, where the function is only approximated locally and all computation is deferred until classification. The k-NN algorithm is among the simplest of all machine learning algorithms. The neighbors are taken from a set of objects for which the class (for k-NN classification) or the object property value (for k-NN regression) is known.

STEP 1: BEGIN

STEP 2: Input: $D = \{(x_1, c_1), \dots, (x_N, c_N)\}$

STEP 3: $x = (x_1, \dots, x_n)$ new instance to be classified

STEP 4: FOR each labelled instance (x_i, c_i) calculate $d(x_i, x)$

STEP 5: Order $d(x_i, x)$ from lowest to highest, ($i = 1 \dots N$)

STEP 6: Select the K nearest instances to x : D_x^k

STEP 7: Assign to x the most frequent class in D_x^k

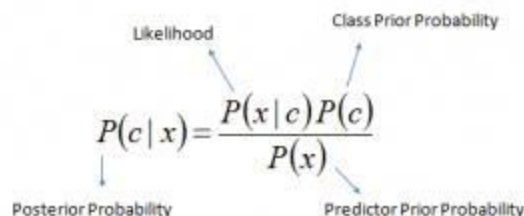
STEP 8: END

NAIVE BAYES ALGORITHM

It is a classification technique based on Bayes' Theorem with an assumption of independence among predictors. In simple terms, a Naive Bayes classifier assumes that the presence of a particular feature in a class is unrelated to the presence of any other feature. For example, a fruit may be considered to be an apple if it is red, round, and about 3 inches in diameter. Even if these features depend on each other or upon the existence of the other features, all of these properties independently contribute to the probability that this fruit is an apple and that is why it is known as 'Naive'.

Naive Bayes model is easy to build and particularly useful for very large data sets. Along with simplicity, Naive Bayes is known to outperform even highly sophisticated classification methods.

Bayes theorem provides a way of calculating posterior probability $P(c|x)$ from $P(c)$, $P(x)$ and $P(x|c)$. Look at the equation below:



The diagram shows the equation $P(c|x) = \frac{P(x|c)P(c)}{P(x)}$ with arrows pointing from labels to the terms in the equation. 'Likelihood' points to $P(x|c)$, 'Class Prior Probability' points to $P(c)$, 'Posterior Probability' points to $P(c|x)$, and 'Predictor Prior Probability' points to $P(x)$.

$$P(c|X) = P(x_1|c) \times P(x_2|c) \times \dots \times P(x_n|c) \times P(c)$$

Above,

- $P(c|x)$ is the posterior probability of class (c , target) given predictor (x , attributes).
- $P(c)$ is the prior probability of class.
- $P(x|c)$ is the likelihood which is the probability of predictor given class.
- $P(x)$ is the prior probability of predictor.

DATA COLLECTION

Data mining is the process of analyzing various hidden patterns of data data according to different views for categorization into required information. This data is been collected and gathered from common area, such as agricultural department for efficient analysis, data mining algorithms department for efficient analysis, data mining algorithms, improving business decision making and other information requirements to ultimately reduce the costs and increase revenue.

SYSTEM TESTING

TESTING PROCESS

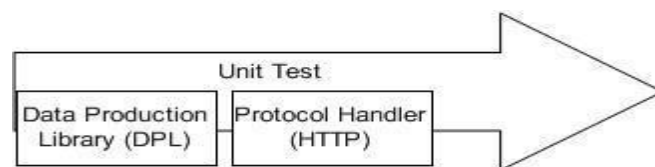
The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies and/or a finished product it is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

Types of Tests

1. White Box Testing
2. Black Box Testing
3. Unit Testing
4. Integration Testing
5. Alpha Testing
6. Beta Testing

Unit Testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program input produces valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application. It is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.



4.5.1 UNIT TESTING

Integration Testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfactory, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

Functional Testing

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system.

Functional testing is centered on the following items:

- **Valid Input** is used to identified classes of valid input must be accepted.
- **Invalid Input** is used to identified classes of invalid input must be rejected.
- **Functions** is used to identified functions must be exercised.
- **Output** is used to identify classes of application outputs.

White Box Testing

White Box Testing is a testing in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is used to test areas that cannot be reached from a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated.

CHAPTER 5

RESULTS AND DISCUSSION

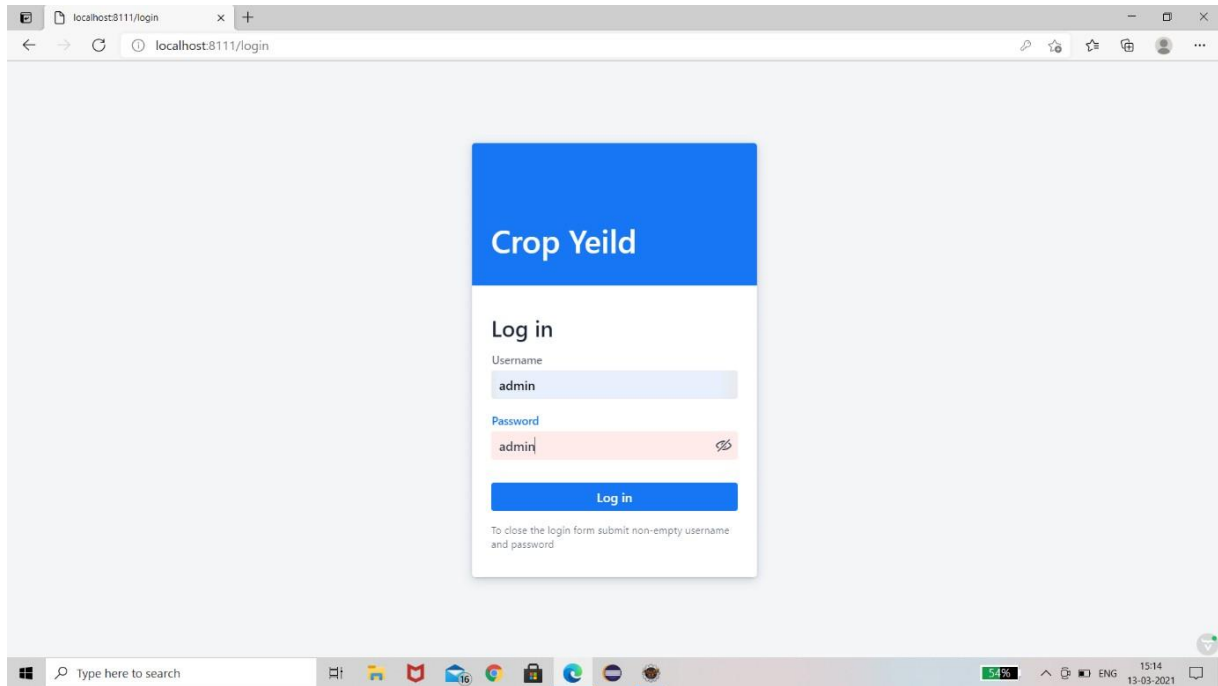


FIG 5.1 LOGIN PAGE

In the above fig we can see the login page of the admin so that the admin can login through this to add the fertilizers and crops and he can update the rate to the users and the admin also should give his correct contact number and email address by that the user can contact that admin and also here we have two login pages one is for user and another one is for admin. Here first we need to enter the username and next we have to enter the password and by that we can click the login button.

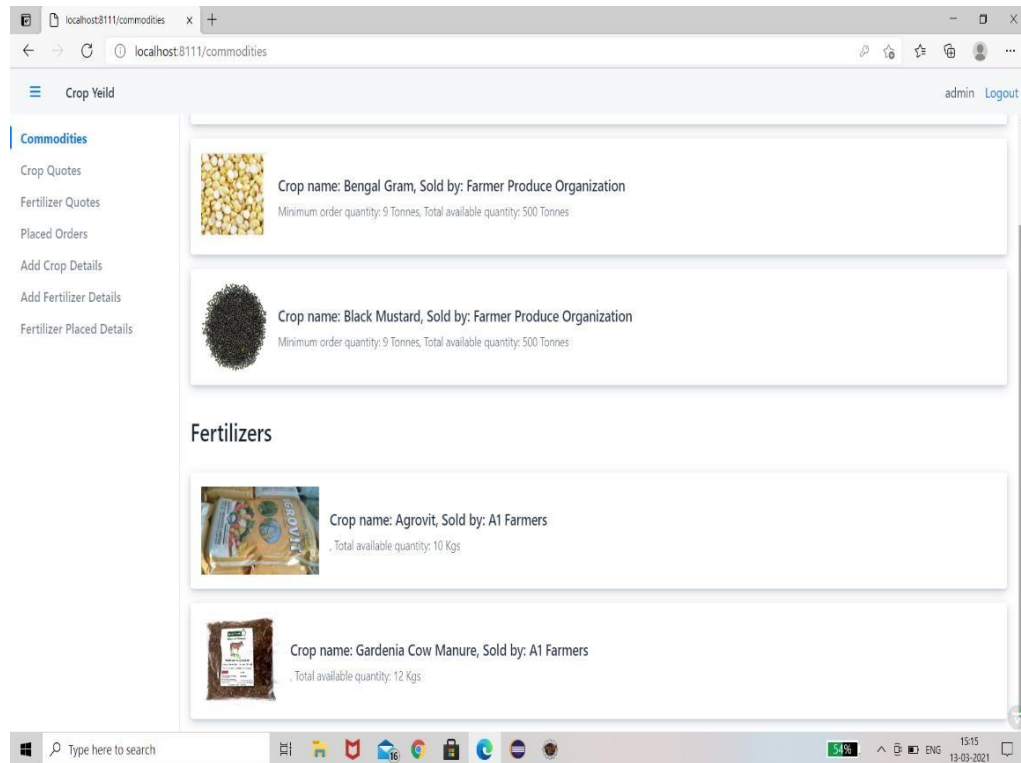


FIG 5.2 HOME PAGE

In the above pic we can see the home page of admin the admin have totally six commodities and we can see the crops and fertilizers which is shown in the figure and the admin can add the tare of the fertilizers and crops and also he can add the new crops and fertilizers . And which orders got placed the admin can see and he can accept the orders.

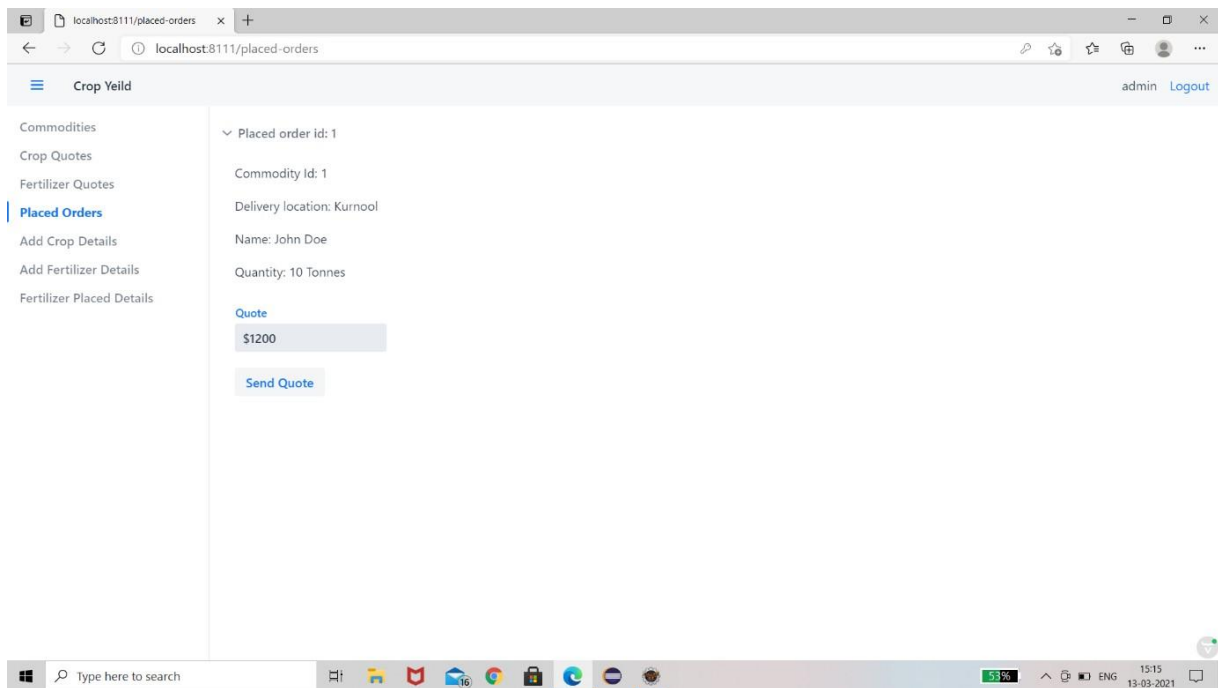


FIG 5.3 PLACED ORDERS

In the above fig we can see the admin can send the rates to the farmers through the notification to the user.

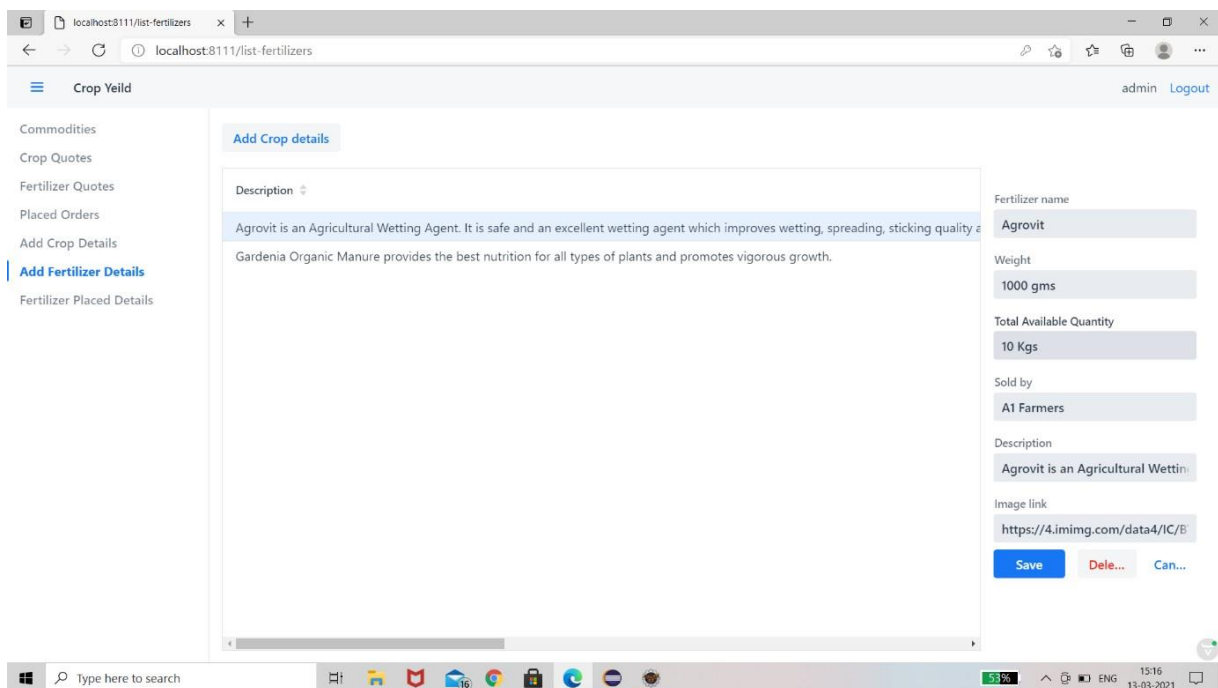


FIG 5.4 ADD FERTILIZERS DETALIS

In the above figure we can see the admin can add the fertilizers details and it will show the what fertilizers are avabile in the home page.

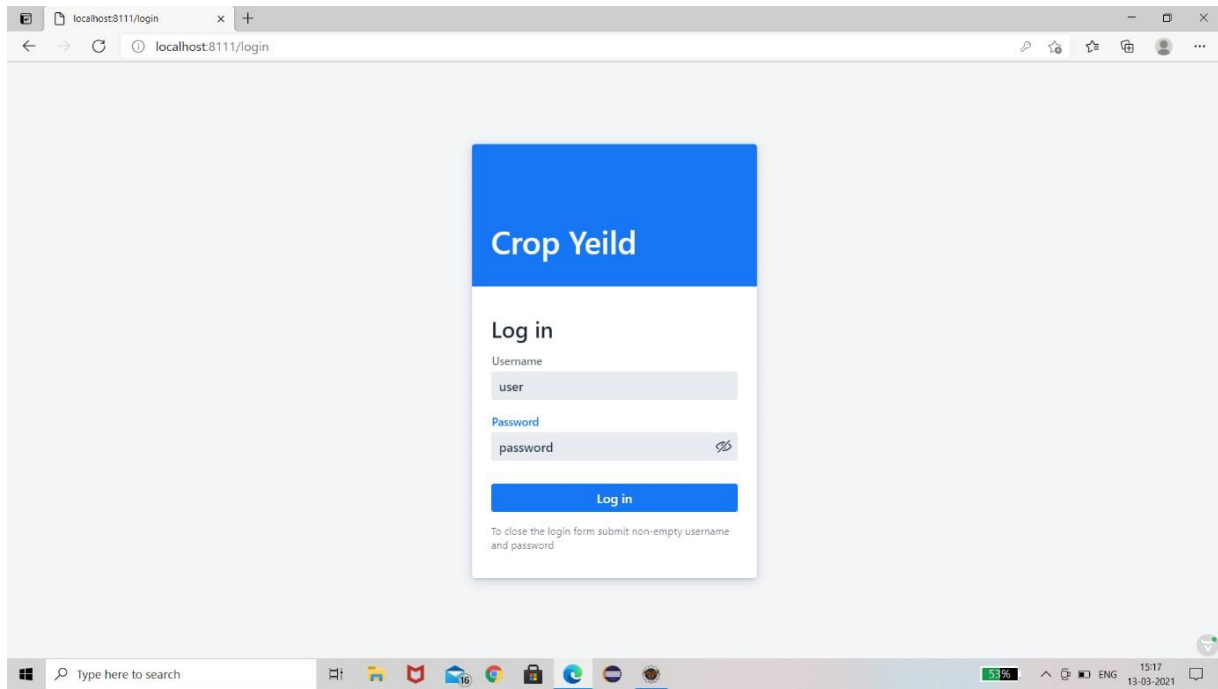


FIG 5.5 USER LOGIN PAGE

This is the first activity, User needs to provide a correct contact number and a password, which user enters while registering, in order to login into the webpage. If information provided by the user matches with the data in the database table then user successfully login into the webpage else message of login failed is displayed and user need to re-enter correct information. A link to the register activity is also provided for registration of new users. A new user who wants to access the website needs to register first before login. By clicking on register button in login activity, the register activity gets open. A new user registers by entering full name, password and contact number. A user needs to enter password again in confirm password textbox for confirmation. When user enters the information in all textboxes, on the click of register button, the data is transferred to database and user is directed to login activity again. Registered user then needs to login in order to access the webpage. Validations are applied on all the textboxes for proper functioning of the webpage.

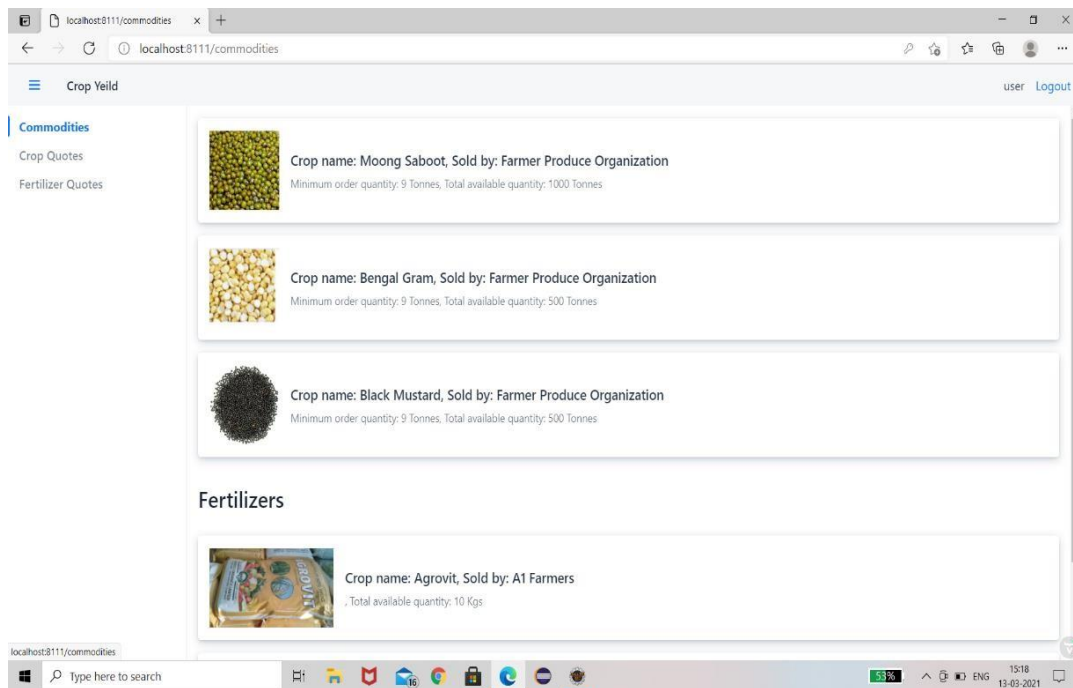


FIG 5.6 USER HOME PAGE

Like information in each textbox is must that is each textbox, either it is of name, contact, password or confirm password, will not be empty while registering. If any such textbox is empty webpage will give message of information is must in each textbox. Also data in password and confirm password fields must match for successful registration. Another validation is contact number must be valid one that is of 10 digits. If any such validation is violated then registration will be unsuccessful and then user needs to register again. Message that webpage will display when one of the field is empty. If all such information is correct user will be directed to login activity for login into the webpage.

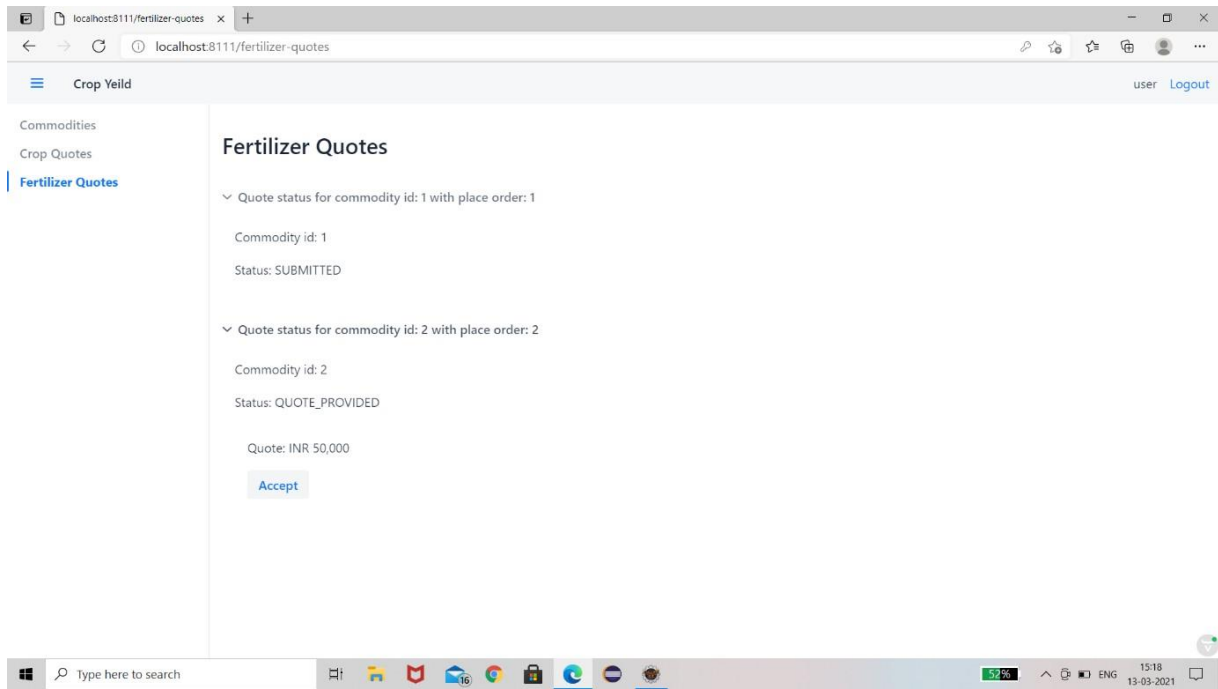


FIG 5.7 CALCULATE FERTILIZER VALUE

In this project, Fertilizer value calculated by quality of the fertilizers are identified using ranking process. By this process the rate of the low quality and high quality fertilizer is also notified. In the pic we can see that fertilizer quotes we can add the fertilizer and can send to the farmer by that admin can see what orders can from the user and admin need to accept the order and conform the rate of the fertilizers and crops.

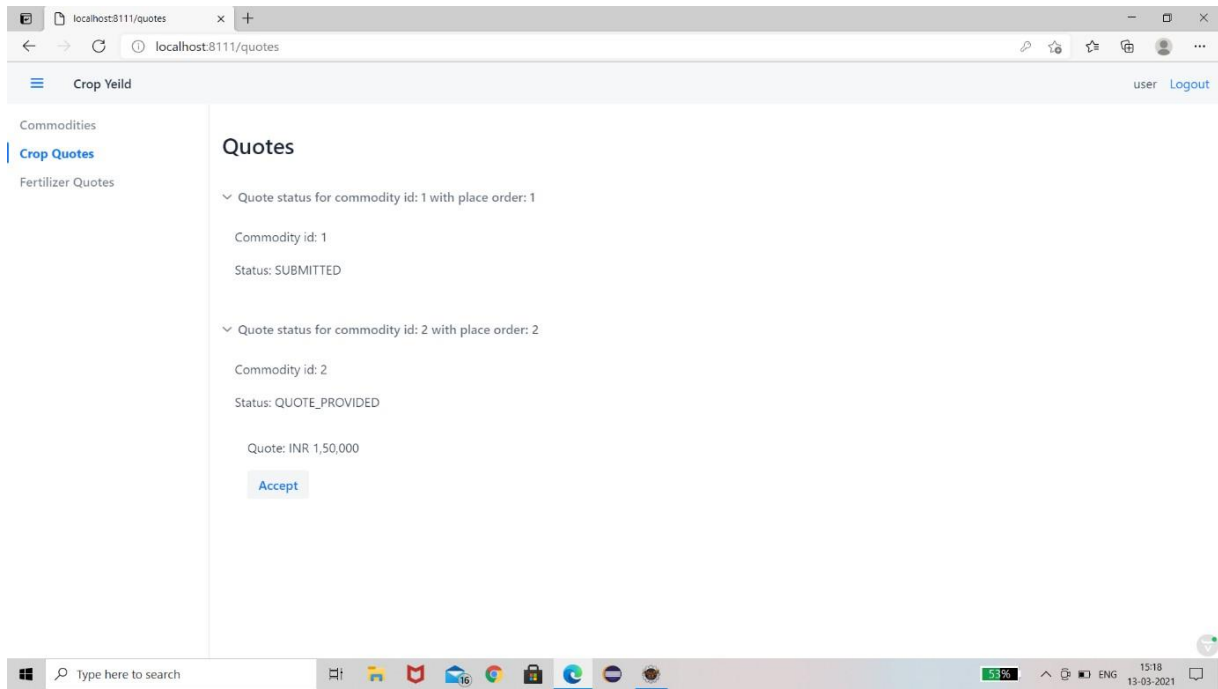


FIG 5.8 SMS SEND TO THE FARMER

In this project the data analysis technology is used to update the rate change through notification. The notifications are send immediately when the rate of the fertilizer is changed in the market. Different types of land condition. Here we can see that crops quotes that sms send to the farmer by that what crops and fertilizer farmer need he need to add the crop and submit to the admin by that admin will accept the order.

CHAPTER 6

CONCLUSION AND FUTURE WORK

CONCLUSION

This open attitude determines the degree and scope of information sharing. Big data analysis technology can effectively improve the performance of fertilizer value updation. This project proposes a novel intelligent system for agricultural fertilizer price prediction based on fertilizer cost. The key idea is to use ensemble of classifiers for prediction. The usage of ensemble of classifiers paves a path way to make a better decision on predictions due to the usage of multiple classifiers. Further, a ranking process is applied for decision making in order to select the classifiers results. This system is used to predict the cost of the fertilizers for further. A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs.

FUTURE WORK

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making. The input is designed in such a way so that it provides security and ease of use with retaining the privacy.

REFERENCES

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- [2] J. Meng, "Research on the cost of agricultural products circulation and its control under the new normal economic development," Commercial Times, no. 23, pp. 145147, 2016.
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- [6] A Survey on Crop Recommendation Using Machine Learning by M.V.R. Vivek, D.V.V.S.S. Sri Harsha, P. Sardar Maran.
- [7] A Review on Data Mining Techniques for Fertilizer Recommendation by Jignasha M. Jethva¹, Nikhil Gondaliya, Vinita Shah.
- [8] Crop Recommendation System for Precision agriculture by S.Pudumalar, E.Ramanujam, R.Harine Rajashreen, C.Kavyan, T.Kiruthikan, J.Nishan.
- [9] Crop Yield Prediction Using Deep Neural Networks by Saeed Khaki and Lizhi Wang.

APPENDIX

A.PLAGIARISM REPORT

between the new case/data and available cases and put the new case into the category that is the most similar to the available categories. It is used for Regression as well as for Classification but mostly it is used for classification problems. It is also called as lazy learner algorithm because it does not learn from the training set immediately. Naive Bayes Classifier is a supervised learning algorithm, which is based on Bayes's theorem and used for solving classification problems. It is one of the simple and most effective Classification algorithms which help in building the fast machine learning models. It is a probabilistic classifier, which means it predicts on the basis of the probability of an object. The formula for Bayes's theorem is $P(A|B) = \frac{P(B|A)P(A)}{P(B)}$ Where $P(A|B)$ is the probability of hypothesis A on the observed event B. $P(B|A)$ is the probability of evidence given that the probability of a hypothesis is true. $P(A)$ is the probability of hypothesis before observing the evidence. It is a prior probability. $P(B)$ is the probability of evidence and it is a marginal probability. It has the 3 steps to solve. Firstly it will convert the given dataset in to frequency tables. Second it generates the likelihood table by finding probabilities of given features. Third it is used to calculate the posterior probability. In this project it has four modules. User Login Registration Calculate fertilizer value SMS send to farmers. User Login. User needs to provide a correct contact number and password, which user enters while registering, in order to login into webpage. Registration Module-A new user who wants to access the website needs to register first before login. By clicking on the register button in login activity, the register activity gets open. A new user registers by entering full name, Password and contact number. Then after the user have to confirm his password Calculate Fertilizer value- Fertilizer value calculated by the quality of fertilizers is identified using ranking process. By this process the rate of the low quality and high quality is also notified. SMS send to farmers-The data analysis technology is used to update the rate change through notification. The notifications are sending immediately when the rate of the fertilizer is changed in the market. In different types of land condition. 5.RESULTS It is the process of taking the fertilizers in online and it has the following modules that to buy the fertilizers by farmers. It has advantage to not go to cities/towns and it easily bought the farmers. Fig 3 Registration for the user. Fig 4 Login data. Fig 5 placing the orders and add crop details Fig 6 it shows the delivery location and how many tonnes does the required user wants it will be mention. Fig 7 Add the fertilizers and the fertilizers details are also placed. 6.CONCLUSION This open attitude determines the degree and scope of information sharing. Big data analysis technology can effectively improve the performance of the fertilizer value updation. This project proposes a novel intelligent system for agricultural price prediction based on the fertilizer cost. The key idea is to use ensemble of classifiers for prediction. The usage of ensemble of classifiers paves a path way to make better decisions due to the usage of multiple classifiers. Further a ranking process is applied for decision making in order to select the classifiers results. This system is used to predict the cost of the fertilizers for further. 7.REFERENCES [1] Manpreet Kaur, Heena Gulati, Harish Kundra, "Data Mining in Agriculture on Crop Price prediction: Techniques and Applications", International Journal of Computer Applications Volume 99-No.12, August 2014. [2] J. Meng, "Research on the cost of agricultural products circulation and its control under the new normal economic development," Commercial times, no.23,pp.145147, 2016. [3] A. Kalokylos et al., "Farm management systems and the future internet era," Comput. Electron. Agricult., vol. 89, pp. 130-144, Nov.2012. [4] N. N. Li, T. S. Li, Z. S. Yu, Y. Rui, Y. Y. Miao and Y. S. Li, "Factors influencing farmers' adoption of new technology based on Logistic-ISM model-a case study of potato planting technology in Dingxi City, Gansu Province "Progress in Geography, vol.33, no.4,pp.542-551,2014. [5] Y. Wang, " A neural network adaptive control based on rapid learning method and its application," Advances in Modeling and Analysis , Vol.46(3),pp.27-34,1994.

Report Title:	Fertilizer value updation to farmers
Report Link: (Use this link to send report to anyone)	https://www.check-plagiarism.com/plag-report/23540172999d5a26a0075bcd061e643b30451615798617
Report Generated Date:	15 March, 2021
Total Words:	1871
Total Characters:	12125

Keywords/Total Words Ratio:	80.42%
Excluded URL:	No
Uniques:	90%
Matched:	10%

Sentence wise detail:

B.JOURNAL REPORT

PREDICTION OF FERTILIZERS USING MACHINE LEARNING

¹Ponnala Sai Sravanthi, ²Soma Roshini and ³M.S.Roobini

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¹tvvnlakshmi999@gmail.com, ²roshinisoma2000@gmail.com, ³roobini.cse@sathyabama.ac.in

Abstract- In agriculture crops are living plants grown by farmers. Most crops are foods such as grains, vegetables, or fruits. Farms are usually made to grow just kind of crop. Crop yield is the measurement of the amount of agricultural production harvested-yield of a crop-per unit land area. Fertilizer value updation has a positive practical significance for guiding agricultural production and for notifying the change in market rate of fertilizer to the farmer. In this project the data analysis technology is used to update the rate change through notification. The notifications are send immediately when the rate of fertilizer is changed in the market. Different types of land condition. So the quality of the fertilizers is identified using ranking process. By this process the rate of the low quality and high quality is also notified. The models used in this are Support Vector Machines (SVM), Naïve Baye's (NB), K-Nearest Neighbour (KNN) algorithms to predict the cost of fertilizers for the further usage of the agriculturalists. Further, a ranking process is applied for decision making in order to select the classifier results. **Keywords:** Crop yield prediction, Machine Learning, Fertilizers.

1.INTRODUCTION

In the world of developing technologies, the success of sharing information will help the agriculturists in realizing and developing this potential.

Crop yield prediction is the methodology to predict the yield of crops using different parameters like rainfall, temperature, fertilizers, pesticides, ph level, and other atmospheric conditions and parameters.

The information sharing is that the valuable and timely information being shared between agriculturists, either formally or informally.

The willingness of information sharing refers to the open attitude among agriculturists. This open attitude determines the degree and scope of information sharing.

Using web-technologies like html and css we build the web application, We create dataset by gathering data from multiple resources and place them in place which is used to predict the price of the fertilizers and results are subjected to non-linear test later priorities are set and rankings are given to the list of fertilizers.

Place information in our application and share the information to agriculturists whose data is collected and stored in the mysql server. Then software to automatically send the updated information to the agriculturists in the form of text messages. So that agriculturists are no need to go to nearby towns and cities to know the updated information.

The Datasets are collected from various resources. Data parsing and cleansing techniques are used to apply to make the raw data into processing data. Raw data is unprocessed computer data. This information may be stored in a file, or may just be a collection of numbers and characters stored on somewhere in the computer's hard disk.

The data collected is a subject to machine learning system along with runtime analysis makes an efficient fertilizer value updation system.

Usage of Ensemble of classifiers makes the model more robust and efficient. Ranking technique is used

in this project to help us to make efficient decisions. Create web application for user registrations and collection of data. Usage of software suggests the users in SMS format.

We will use machine learning algorithms to predict the price of the fertilizers for the next two months. For prediction purpose we will be using Support Vector Machine (SVM), Naïve Baye's and K-Nearest Neighbour (KNN) algorithms to predict the cost of fertilizers. Ranking process is also applied.

2.LITERATURE SURVEY

- "A Review on Data Mining Techniques for Fertilizer Recommendation", (2018) it is used to keep up the nutrition levels in the soil in case of deficiency; fertilizer is added to the soil. Various data mining frameworks used on cultivating soil dataset for fertilizer recommendation.
- "A Survey on Data Mining Techniques in Agriculture", (2015) Data Mining plays an important role in decision making on several aspects with agriculture filed. It integrates the work of several authors in a single place so it is valuable for specialists to get data of current situation of data mining systems and applications in context to farming yield.
- "Agro Nutri Android Application", (2016) It communicates the idea regarding the making of AgroNutri an android application that conveying the harvest particular fertilizer amount to be applied. The idea is to calculate the measure of NPK composts to be applied depend on the blanked proposal of the crop of interest. This application works depend on the product chosen by the farmer and that is taken as input.
- "Machine Learning: Applications in Indian Agriculture", (2016) Agriculture is a field

that has been lacking from adaption of technologies and their advancements. This paper has evaluated the different uses of machine learning in the framing area. It additionally gives the knowledge into the inconveniences looked by Indian farmers and how they can resolved using these procedures.

- “Impacts of the population growth, economic development and technical change on global food production and consumption”,(2021) The decades of humanity will request more food from less land and water assets. The impact of technical change is amplified by adaptations of land management intensities.
- “A smart agricultural model by integrating Iot, Mobile and cloud-based big data analytics”, (2017)A blueprint of Iot andDA in agriculture has been shown in this paper. The key issues are security and cost. It is typical that as contention increases in the cultivating part.

Existing System

The computational and data demands of structural price forecasting generally far exceed than what is routinely available in developing countries .In time series modelling, past observations of the same variable are collected and analysed to develop a model describing the underlying relationship. Time series modelling requires less difficult for the data input for regular and up-to date price forecasting. Hence there is a need for better classification which would be an ensemble or hybrid classification model. The disadvantages are its efficiency is low. And it has more number of repeated works.

Proposed System

The data analysis technology is used to update the rate change through notification. These notifications are sending immediately when the rate of fertilizer is changed in the market. It also notifies the rate of high quality and low quality. Ranking process is also applied for this process. It is useful for faraway from towns/cities. It has better time efficiency. It reduces the repeated work.



Fig 1 Proposed System for prediction of fertilizers by the different modules.

3. SYSTEM ARCHITECTURE

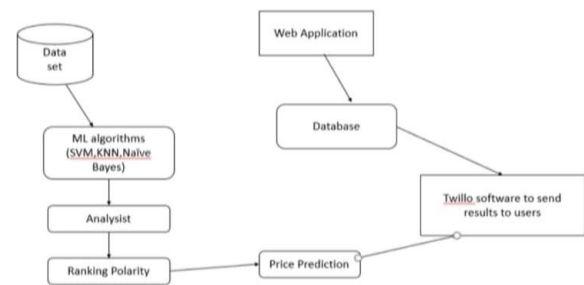


Fig 2 System Architecture

4.METHADODOLOGY

The modules used in this project are-

- Support Vector Machine is a supervised machine learning algorithm which can be used for classification or regression problems. It uses a technique called the kernel trick to transform the data and then based on the transformations it finds an optimal boundary between the possible outputs.
- K-Nearest Neighbor(KNN) algorithm is one of the simplest machine learning algorithms based on supervised learning technique.
- It assumes the similarity between the new case/data and available cases and put the new case into the category that is the most similar to the available categories.
- It is used for Regression as well as for Classification but mostly it is used for classification problems. It is also called as lazy learner algorithm because it does not learn from the training set immediately.
- Naïve Baye’s Classifier is a supervised learning algorithm, which is based on

Baye's theorem and used for solving classification problems.

- It is one of the simple and most effective Classification algorithms which help in building the fast machine learning models.
- It is a probabilistic classifier, which means it predicts on the basis of the probability of an object.
- The formula for Baye's theorem is
$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

Where $P(A|B)$ is the probability of hypothesis A on the observed event B. $P(B|A)$ is the probability of evidence given that the probability of a hypothesis is true. $P(A)$ is the probability of hypothesis before observing the evidence. It is a prior probability.

$P(B)$ is the probability of evidence and it is a marginal probability.

- It has the 3 steps to solve. Firstly it will convert the given dataset in to frequency tables. Second it generates the likelihood table by finding probabilities of given features. Third it is used to calculate the posterior probability.

In this project it has four modules.

- User Login
- Registration
- Calculate fertilizer value
- SMS send to farmers.

User Login- User needs to provide a correct contact number and password, which user enters while registering, in order to login into webpage.

Registration Module-A new user who wants to access the website needs to register first before login. By clicking on the register button in login activity, the register activity gets open. A new user registers by entering full name, Password and contact number. Then after the user have to confirm his password

Calculate Fertilizer value-Fertilizer value calculated by the quality of fertilizers is identified using ranking process. By this process the rate of the low quality and high quality is also notified.

SMS send to farmers-The data analysis technology is used to update the rate change through notification. The notifications are sending immediately when the rate of the fertilizer is changed in the market. In different types of land condition.

5. RESULTS

It is the process of taking the fertilizers in online and it has the following modules that to buy the fertilizers by farmers. It has advantage to not go to cities/towns and it easily bought the farmers.

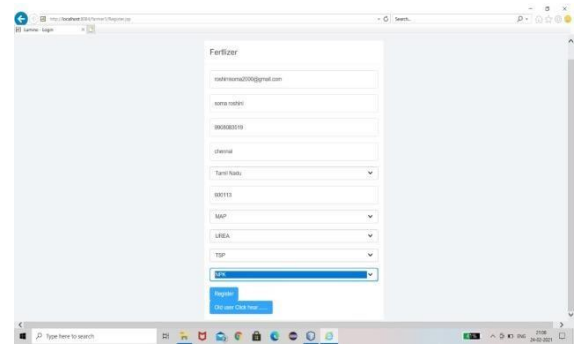


Fig 3 Registration for the user.

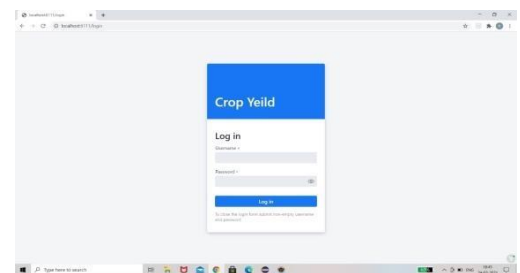


Fig 4 Login data.



Fig 5 placing the orders and add crop details



Fig 6 It shows the delivery location and how many tonnes does the required user wants it will be mention.

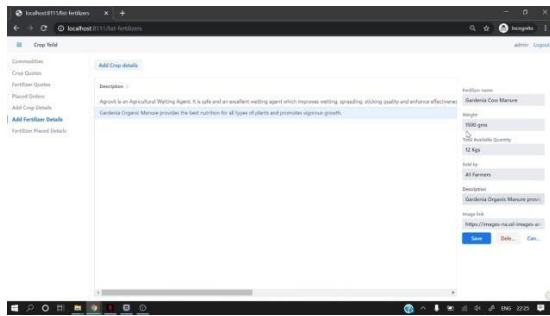


Fig 7 Add the fertilizers and the fertilizers details are also placed.

6. CONCLUSION

This open attitude determines the degree and scope of information sharing. Big data analysis technology can effectively improve the performance of the fertilizer value updation. This project proposes a novel intelligent system for agricultural price prediction based on the fertilizer cost. The key idea is to use ensemble of classifiers for prediction. The usage of ensemble of classifiers paves a path way to make better decisions due to the usage of multiple classifiers. Further a ranking process is applied for decision making in order to select the classifiers results. This system is used to predict the cost of the fertilizers for further.

7. REFERENCES

- [1] Manpreet Kaur, Heena Gulati, Harish Kundra, "Data Mining in Agriculture on Crop Price prediction: Techniques and Applications", International Journal of Computer Applications Volume 99-No.12, August 2014.
- [2] J. Meng, "Research on the cost of agricultural products circulation and its control under the new normal economic development", "Commercial times, no.23,pp.145147, 2016.
- [3] A Kaloxylas et al., "Farm management systems and the future internet era," Comput. Electron. Agricult., vol 89, pp. 130-144, Nov.2012.
- [4] N. N. Li, T. S. Li, Z. S. Yu, Y. Rui, Y. Y. Miao and Y. S. Li, "Factors influencing farmers' adoption of new technology based on Logistic-ISM model-a case study of potato planting technology in Dingxi City, Gansu Province "Progress in Geography, vol.33, no.4,pp.542-551,2014.
- [5] Y. Wang, "A neural network adaptive control based on rapid learning method and its application, "Advances in Modeling and Analysis , Vol.46(3),pp.27-34,1994.

SOURCE CODE

```
package in.crop.yeild;
import static in.crop.yeild.constants.PlaceOrderStatus.QUOTE_PROVIDED;
import static in.crop.yeild.constants.PlaceOrderStatus.SUBMITTED;
import java.time.LocalDate;
import java.util.Arrays;
import org.springframework.boot.CommandLineRunner;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.boot.autoconfigure.info.ProjectInfoProperties.Build;
import org.springframework.context.annotation.Bean;
import in.crop.yeild.constants.PlaceOrderStatus;
import in.crop.yeild.domain.CropDetails;
import in.crop.yeild.domain.FertilizerDetails;
import in.crop.yeild.domain.FertilizerPlaceOrder;
import in.crop.yeild.domain.PlaceOrder;
import in.crop.yeild.repository.CropDetailsRepository;
import in.crop.yeild.repository.FertilizerPlaceOrderRepository;
import in.crop.yeild.repository.FertilizerRepository;
import in.crop.yeild.repository.PlaceOrderRepository;

@SpringBootApplication
public class CropYieldApplication {

    public static void main(String[] args) {
        SpringApplication.run(CropYieldApplication.class, args);
    }

    @Bean
    public CommandLineRunner run(CropDetailsRepository repository,
        PlaceOrderRepository placeOrderRepository,
        FertilizerRepository fertilizerRepository,
        FertilizerPlaceOrderRepository fertilizerPlaceOrderRepository) {
        return args -> {

            fertilizerPlaceOrderRepository.saveAll(Arrays.asListFertilizerPlaceOrder.builder()
                .additionalInfo("Drop at office hours")
                .commodityId(1)
                .email("abc@email.com")
                .location("Kurnool")
                .mobileNumber("0987654321")
                .name("John Doe")
                .quantity("10 Kgs")
                .user("user")
                .placeOrderStatus(SUBMITTED)
                .build()
                ,FertilizerPlaceOrder.builder()
                .additionalInfo("Drop at office hours")
```

```

        .commodityId(2)
        .email("abc@email.com")
        .location("Kurnool")
        .mobileNumber("0987654321")
        .name("John Doe")
        .quantity("2 kgs")
        .user("user")
        .placeOrderStatus(QUOTE_PROVIDED)
        .quote("INR 50,000")
        .build()

    ));

    fertilizerRepository.saveAll(Arrays.asList(

        FertilizerDetails.builder()
        .description("Agrovit is an Agricultural Wetting Agent. "
            + "It is safe and an excellent wetting agent which
improves wetting, "
            + "spreading, sticking quality and enhance effectiveness of
pesticidant spray.")
        .name("Agrovit")
        .imageLink("https://4.imimg.com/data4/IC/BT/NSDMERP-
55072662/agrovitfungicide-500x500.png")
        .soldBy("A1 Farmers")
        .weight("1000 gms")
        .totalAvailableQuantity("10 Kgs")
        .build(),

        FertilizerDetails.builder()
        .description(
            "Gardenia Organic Manure provides the best nutrition for all types
of plants "+ "and promotes vigorous growth.")
        .name("Gardenia Cow Manure")
        .imageLink("https://images-na.ssl-images
amazon.com/images/I/91DTFkRR-L._SL1500_.jpg").soldBy("A1 Farmers")
        .weight("1500 gms")
        .totalAvailableQuantity("12 Kgs")
        .build()

    ));

    placeOrderRepository.saveAll(Arrays.asList(

        PlaceOrder.builder()
        .additionalInfo("Drop at office hours")
        .commodityId(1)

```

```

.email("abc@email.com")
.location("Kurnool")
.mobileNumber("0987654321")
.name("John Doe")
.quantity("10 Tonnes")
.user("user")
.placeOrderStatus(SUBMITTED)
.build(),

PlaceOrder.builder()
.additionalInfo("Drop at office hours")
.commodityId(2)
.email("abc@email.com")
.location("Kurnool")
.mobileNumber("0987654321")
.name("John Doe")
.quantity("20 Tonnes")
.user("user")
.placeOrderStatus(QUOTE_PROVIDED)
.quote("INR 1,50,000")
.build()

));

```

```

repository.saveAll(Arrays.asList(

CropDetails.builder()
.cropName("Moong Saboot")
.soldBy("Farmer Produce Organization")
.category("Rice and Pulses")
.subCategory("Moong")
.minOrderQuantity("9 Tonnes")
.totalAvailableQuantity("1000 Tonnes")
.addedOn(LocalDate.of(2020, 6, 29))
.description("\Fresh Saboot Moong of high quality
available with our Farmers.\")
and Fresh Produces.\")

.sellerDealsWith("\We deal with pulses, Oil seeds

.taste("Good")
.originOfAgriCommodity("Madhya Pradesh")
.supplyAbilityOfSeller("400 Tonnes/Month")
.leadTimeOfDispatch("3 Days Within Recieving
Order")

.packagingOfAgriCommodity("25kg and 50kg Jute
Bag")

.imageUrl("https://5.imimg.com/data5/JU/DE/MY-
5550110/indian-cashew-500x500.jpg")

```

```

        .build(),

        CropDetails.builder()
        .cropName("Bengal Gram")
        .soldBy("Farmer Produce Organization")
        .category("Cereals")
        .subCategory("Bengal Gram")
        .minOrderQuantity("9 Tonnes")
        .totalAvailableQuantity("500 Tonnes")
        .addedOn(LocalDate.of(2020, 6, 29))
        .description("\Bengal Gram procured from the farm
with low moisture content and uniform shape.\")
        .sellerDealsWith("\We deal with pulses, Oil seeds
and Fresh Produces.\")

        .taste("Normal")
        .originOfAgriCommodity("Uttar Pradesh")
        .supplyAbilityOfSeller("100 Tonnes/Month")
        .leadTimeOfDispatch("3 Days Within Recieving
Order")

        .packagingOfAgriCommodity("25kg and 50kg Jute
Bag")

        .imageUrl("https://tiimg.tistatic.com/fp/1/006/208/fried-bengal-gram-dal-
572.jpg")

```

```

        .build(),

        CropDetails.builder()
        .cropName("Black Mustard")
        .soldBy("Farmer Produce Organization")
        .category("Oil Seeds")
        .subCategory("Black Mustard")
        .minOrderQuantity("9 Tonnes")
        .totalAvailableQuantity("500 Tonnes")
        .addedOn(LocalDate.of(2020, 6, 29))
        .description("\Mustard of high quality with rich oil
content and low moisture content.\")
        .sellerDealsWith("\We deal with pulses, Oil seeds
and Fresh Produces.\")

        .taste("Normal")
        .originOfAgriCommodity("Uttar Pradesh")
        .supplyAbilityOfSeller("200 Tonnes/Month")
        .leadTimeOfDispatch("3 Days Within Recieving
Order")

        .packagingOfAgriCommodity("25kg and 50kg Jute
Bag As per buyers requirement")

        .imageUrl("https://4.imimg.com/data4/RI/SC/MY-
11555849/black-mustard-seed-500x500.jpg")
        .build()
    ));

```

```

    };

```

}
}