ESTIMATE THE CROP YIELD USING DATA ANALYTICS

TEAM ID:PNT2022TMID22213

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1.INTRODUCTION

1.1 PROJECT OVERVIEW

Agriculture is the backbone of Indian Economy in India, majority of the farmers are not getting the expected crap yield due to several reasons. The agricultural yield is primarily depended on weather conditions. Rainfall conditions also influences the rice cultivation. In this context, the farmers necessarily require a timely advice to predict the future crop productivity and an analysis is to be made in order to help the farmers to maximize the crop production in their crops. Yield prediction is an important agricultural problem. Every farmer is interested in knowing how much yield he is about expect. In the past, yield prediction was performed by considering farmer's previous experience on a particular crop. The volume of data is enormous in Indian agriculture. The data when become information is highly useful for many purposes.

1.2 PURPOSE

Crop production in India is one of the most important sources of income and India is one of the top countries to produce crops. As per this project we will be analysing some important visualization, creating a dashboard and by going through these we will get most of the insights of Crop production in India

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

Crop Predictions are important for governments, farmers, and traders - a more accurate prediction of future supply allows for better policies, better profits, and better pricing.

The concept of using satellites to predict crop yield is very simple: Take a picture of a field, look at the crops growing, measure the area of field and predict the yield. However, there are substantial challenges to this, including:

- Clouds
- Scale-global
- Size-small farm to large agri-business
- Colour-it's all green
- Phenology-Identification of relevant crops
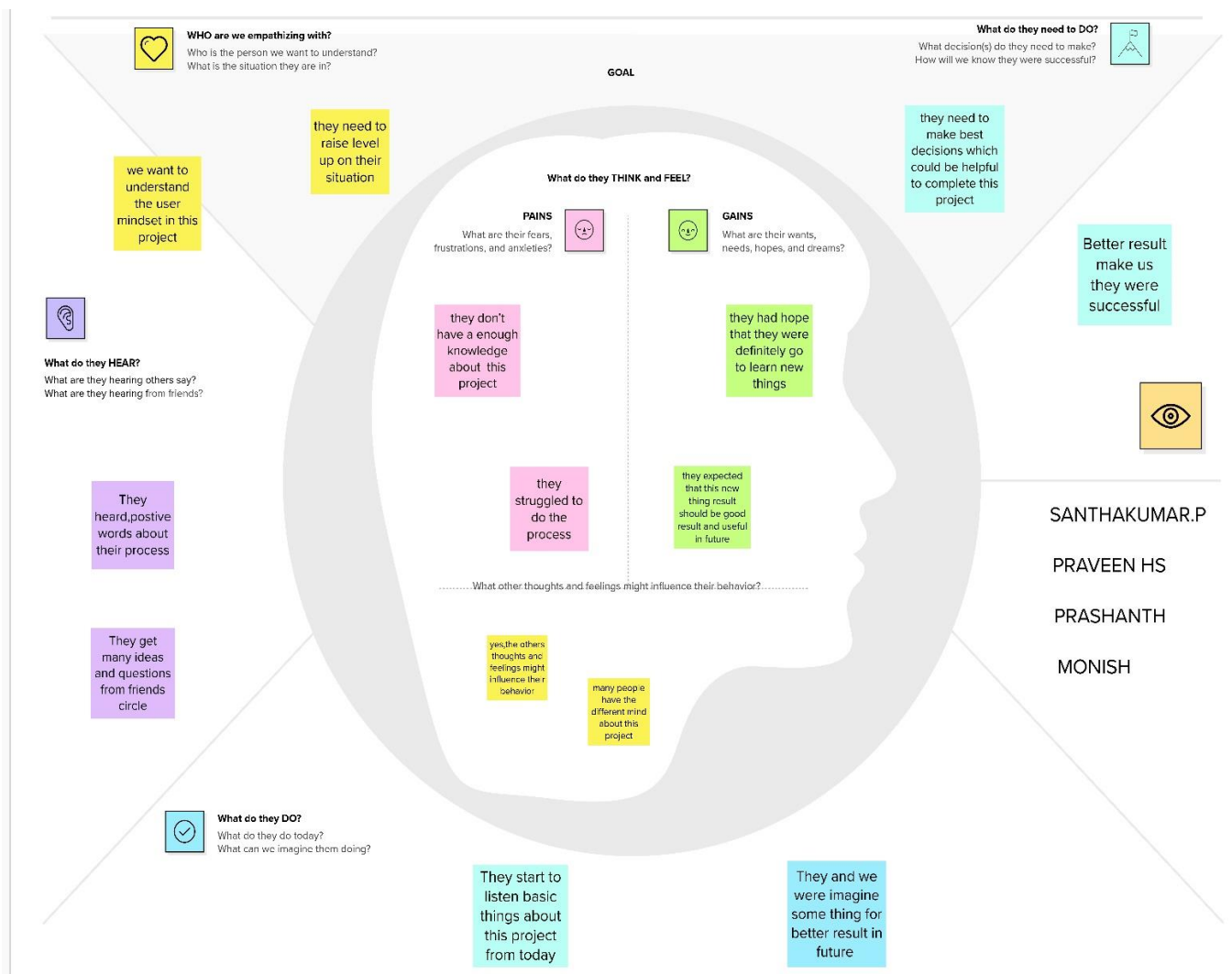- Area Yield - Giving the area does not give the yield.

2. REFERENCES

- https://ieeexplore.ieee.org/document/8697806
- https://ieeexplore.ieee.org/document/7918789
- https://www.researchgate.net/publication/329467349_Agriculture_Data_Analytics_in_Crop_Yield_Estimation_A_Critical_Review
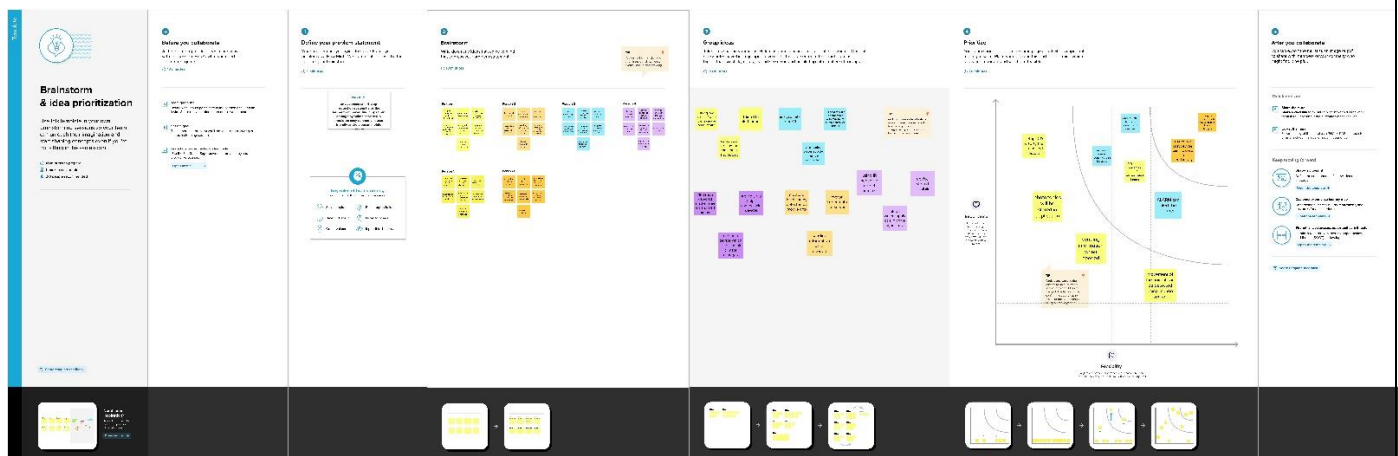- https://ieeexplore.ieee.org/document/8746001/references#references

2.3 PROBLEM STATEMENT DEFINITION

Problem Statement	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A Farmer	Harvest my crops	I am not sure about the best time to harvest the crops	Harvesting in a wrong season can reduce my yield	Disappointment
PS-2	A Farmer	Get more yield when harvesting	Some birds, insects and animals damages the crops they eat the crops which reduces my production	they eat the crops which reduces my production	Frustrated
PS-3	A Farmer	Get proper production	I don't know exactly which crop to plant in my field based on my locality	I got low production last year when I planted a crop that doesn't suit my locality/soil nature	Dispirited

3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP

WHO are we empathizing with?
Who is the person we want to understand?
What is the situation they are in?

GOAL

What do they need to DO?
What decision(s) do they need to make?
How will we know they were successful?

they need to raise level up on their situation

we want to understand the user mindset in this project

they need to make best decisions which could be helpful to complete this project

What do they THINK and FEEL?

PAINS
What are their fears, frustrations, and anxieties?

GAINS
What are their wants, needs, hopes, and dreams?

Better result make us they were successful

they don't have a enough knowledge about this project

they had hope that they were definitely go to learn new things

What do they HEAR?
What are they hearing others say?
What are they hearing from friends?

They heard,postive words about their process

they struggled to do the process

they expected that this new thing result should be good result and useful in future

SANTHAKUMAR.P

PRAVEEN HS

PRASHANTH

MONISH

They get many ideas and questions from friends circle

...........What other thoughts and feelings might influence their behavior?...........

yes,the others thoughts and feelings might influence their behavior

many people have the different mind about this project

What do they DO?
What do they do today?
What can we imagine them doing?

They start to listen basic things about this project from today

They and we were imagine some thing for better result in future

3.2 IDEATION & BRAINSTORMING

Agriculture is important for human survival because it serves the basic need. A well-known fact that the majority of population (≥55%) in India is into agriculture. Due to variations in climatic conditions, there exist bottlenecks for increasing the crop production in India. It has become challenging task to achieve desired targets in Agri based crop yield. Various factors are to be considered which have direct impact on the production, productivity of the crops. Crop yield prediction is one of the important factors in agriculture practices. Farmers need information regarding crop yield before sowing seeds in their fields to achieve enhanced crop yield. The use of technology in agriculture has increased in recent year and data analytics is one such trend that has penetrated into the agriculture field. The main challenge in using big data in agriculture is identification of effectiveness of big data analytics. Efforts are going on to understand how big data analytics can agriculture productivity. The present study gives insights on various data analytics methods applied to crop yield prediction and also signifies the important lacunae points in the proposed area of research

Due to the changing climatic conditions accurate results cannot be predicted by this system. Agriculture sector is struggling to increase the crop production and some of the areas being explored the problem of yield prediction is a major concern.

TOP IDEAS:

● Understand how the data analytics platform will support the overall business strategy of the organization.

● Develop an analytics vision and set target maturity levels for core processes.

● Increasing Innovation, Productivity & Reduce wastage.

● Market demand drive production. Knowledge of seeds, crops, mechanism, soil, climate & agriculture science. Right use of resources like soil and water

● This system will provide a complete technical solution using the internet of thinks to the frames to prevent their crops from wild animals and provide information to the farmers to prevent their crops from wild animals and provide information to the farmers to maximize their production.

3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved	Crop production in India is one of the most important sources of income and India is one of the top countries to produce crops. Big data provides farmers granular data on rainfall patterns, water cycles, fertilizer requirements, and more. This enables them to make smart decisions, such as what crops to plant for better profitability and when to harvest. The right decisions ultimately improve farm yields.
2.	Idea / Solution description	Data analytics can help farmers monitor the health of crops in real-time, create predictive analytics related to future yields and help farmers make resource management decisions based on proven trends. Reducing waste and improving profits
3.	Novelty / Uniqueness	To increase quality and yields, it is crucial to understand the current nutrient levels of the soil to be able to ascertain which areas require improvement.
4.	Social Impact/ Customer Satisfaction	Farmers are always looking for innovations and information to help them boost production and maximize returns on their products. The rise of digital technology has offered access to a wide range of opportunities for more informed and accurate actions in the field. As a result, big data analytics are proving to be a real gamechanger in the industry. With the increased availability of data, farmers have more tools than ever at their disposal, offering numerous benefits. Knowledge is not only powerful, but it can make or break an agricultural producer's success.
5.	Business Model (Revenue Model)	The agricultural entrepreneur to make easier and better decisions based on information. This work aims to sensitize farmers to the importance of adopting data-driven solutions to address the needs of this sector.
6.	Scalability of the Solution	Increases in agricultural productivity lead also to agricultural growth and can help to alleviate poverty in poor and developing countries, where agriculture often employs the greatest portion of the population. As farms become more productive, the wages earned by those who work in agriculture

3.4 PROBLEM SOLUTION FIT

1. CUSTOMER SEGMENT(S) — CS

Farmer's! Who's not near his field in corporate, SME and farmer.

6. CUSTOMER LIMITATIONS EG. BUDGET, DEVICES — CL

1) High adoption costs, security concerns.
2) Not aware of the implementation of agriculture.
3) Use it according to the climate change

5. AVAILABLE SOLUTIONS PLUSES & MINUSES — AS

Monitor different parameters and mobile or web application make easily to farm the crop field .

Define CS, fit into CL

Explore AS, differentiate

2. PROBLEMS / PAINS + ITS FREQUENCY — PR

- Control system of the mechanism is difficult
- Ain't known if the application doesn't work properly.

9. PROBLEM ROOT / CAUSE — RC

If temperature, PH level, humidity & light intensity makes the serious cause for the environment.

7. BEHAVIOR + ITS INTENSITY — BE

Located in rural where internet connectivity might not be strong enough to facilitate fast transmission speeds.

The customer will give the proper products in the crop.

Focus on PR, tap into BE, understand RC

Focus on PR, tap into BE, understand RC

3. TRIGGERS TO ACT — TR

Create opportunities to lift people out of poverty in developing nations. Smart farming reduces the ecological footprint

4. EMOTIONS BEFORE / AFTER — EM

BEFORE: Finances, Heavy work overload and conflict in relationship.
AFTER: people get more info about crop protection make easy to yield.

10. YOUR SOLUTION — SL

"Data Analytics based Smart crop protection system for agriculture"
It help farmers grow more food on less land by protection crops from pests, diseases and weeds as well as raising productivity per hectare.

the sensors and drones sensed information from field and protect the crop.

8. CHANNELS of BEHAVIOR — CH

ONLINE: The Data send through application and sensor data will send to the farmer.

OFFLINE: The control action is taken by the farmers to monitor the farms. through the immediate reaction.

Identify strong TR & EM

Extract online & offline CH of BE

4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

| FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Installation	User can install the app from Google play store or from the website
FR-2	User Registration	Registration through Form Registration through Gmail
FR-3	User confirmation	Confirmation via Email Confirmation via OTP
FR-4	User Login	User should login the app with the user's name and password

4.2 NON- FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution.

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	Everyone can understand the process of using the app easily by the commands given in the app.
NFR-2	Security	It won't show the wrong analytic report while crop yielding
NFR-3	Performance	Performance of the app is very great
NFR-4	Availability	More sub categories are available

5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS
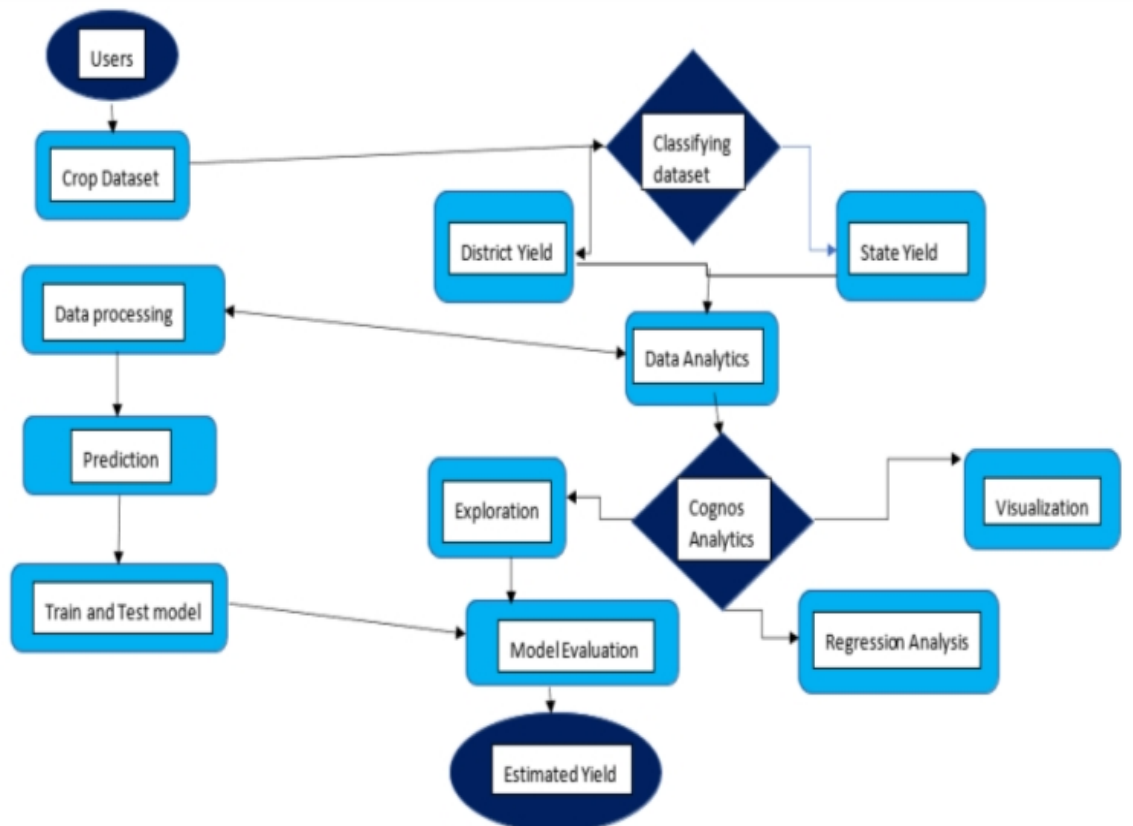
● User can create account for analysis.

● User can access application by any browser.

● Selected data can be extracted.

● Once user had registered I can login to it by the credentials.

● User can access the dashboard. There user can view and upload the data

● The notification for the user by browser on login on application. 7. Extracted data is passed to data analytics for enrichment

● Enriched data is visualized using the Cognos and ML.

5.2 SOLUTION AND TECHNICAL ARCHITECTURE

Estimate The Crop Yield Using Data Analytics:

Crop production in India is one of the most important sources of income and India is one of the top countries to produce crops. As per this project we will be analyzing some important visualization, creating a dashboard and by going through these we will get most of the insights of Crop production in India.

Technical Architecture:
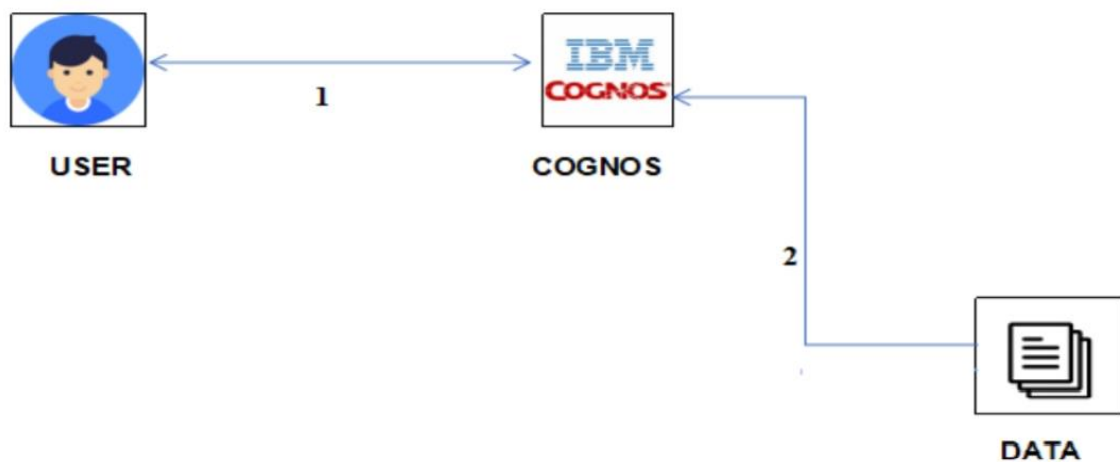
5.3 USER STORIES

Use the below template to list all the user stories for the product.

User Type	Functional Requirement	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, phone number, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I can register for the application by entering my email, phone number, password, and confirming my password.	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through play store application.	I can register & access the dashboard with Login or sign in	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN-6	As a user, I can calculate the crop yield time by using different analysis method		High	Sprint-1
Customer (Web user)		USN-7	As a user, I can login through website also		Medium	Sprint-1
Customer Care Executive						
Administrator						

6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING AND ESTIMATION

Sprint	Total Story Point	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

VELOCITY

We have a 24-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = Sprint\ Duration\ /\ Velocity = 24\ /\ 20 = 1.2$$

BURNDOWN CHART

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies. A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.
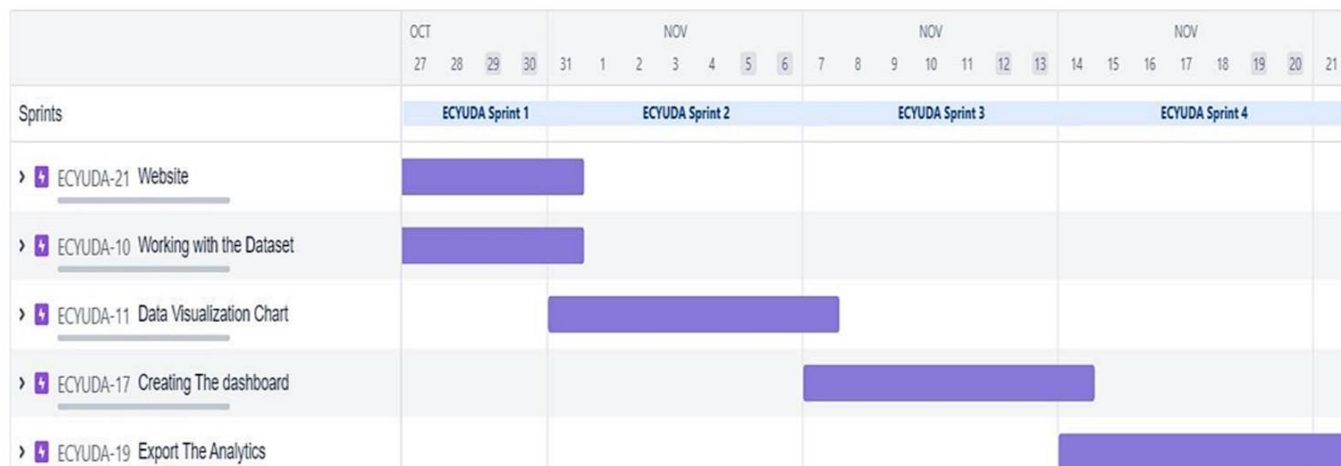
6.2 SPRINT DELIVERY SCHEDULE

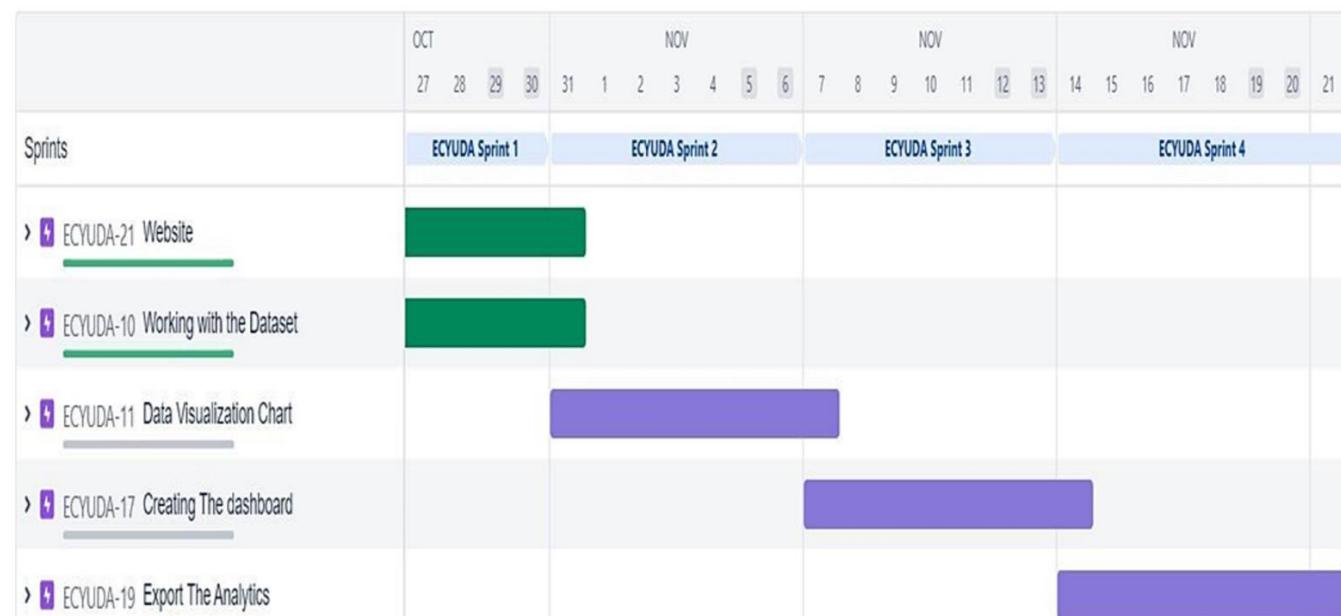| Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for by entering my Agri - id card and request.	2	High	Santhakumar P
		USN-3	As a user, I can register for the application through Gmail	2	Medium	Praveen H S
	Login	USN-4	As a user, I can Call and request or Approach for dataset	2	High	Prashanth Kumar R
	Working with the Dataset	USN-5	To work on the given dataset, Understand the Dataset.	2	High	Vemasani monish
		USN-6	Load the dataset to Cloud platform then Build the required Visualizations.	10	High	Santhakumar P Praveen H S PrashanthKum ar R Vemasani Monish
Sprint-2	Data Visualization Chart	USN-7	Using the Crop production in Indian dataset, create various graphs and charts to highlight the insights and visualizations. *Build a Visualization to showcase Average Crop Production by Seasons.	4	Medium	Santhakumar P
			*Showcase the Yearly usage of Area in Crop Production.	4	Medium	Prashanth Kumar R

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
			Build a visualization to show case top 10 States in Crop Yield Production by Area.	4	Medium	Praveen H S
			Build the required Visualization to showcase the Crop Production by State.	4	Medium	Vemasani Monish
			Build Visual analytics to represent the Sates with Seasonal Crop Production using a Text representation.	4	Medium	Santhakumar P
Sprint-3	Creating The dashboard	USN-8	Create the Dashboard by using the created visualizations.	20	High	Santhakumar.P Prashanth Kumar R Vemasani monish Praveen H S
Sprint-4	Export The Analytics	USN-9	Export the created Dashboard	20	High	Santhakumar P Prashanth Kumar R Praveen H S Vemasani monish

6.3 REPORTS FROM JIRA
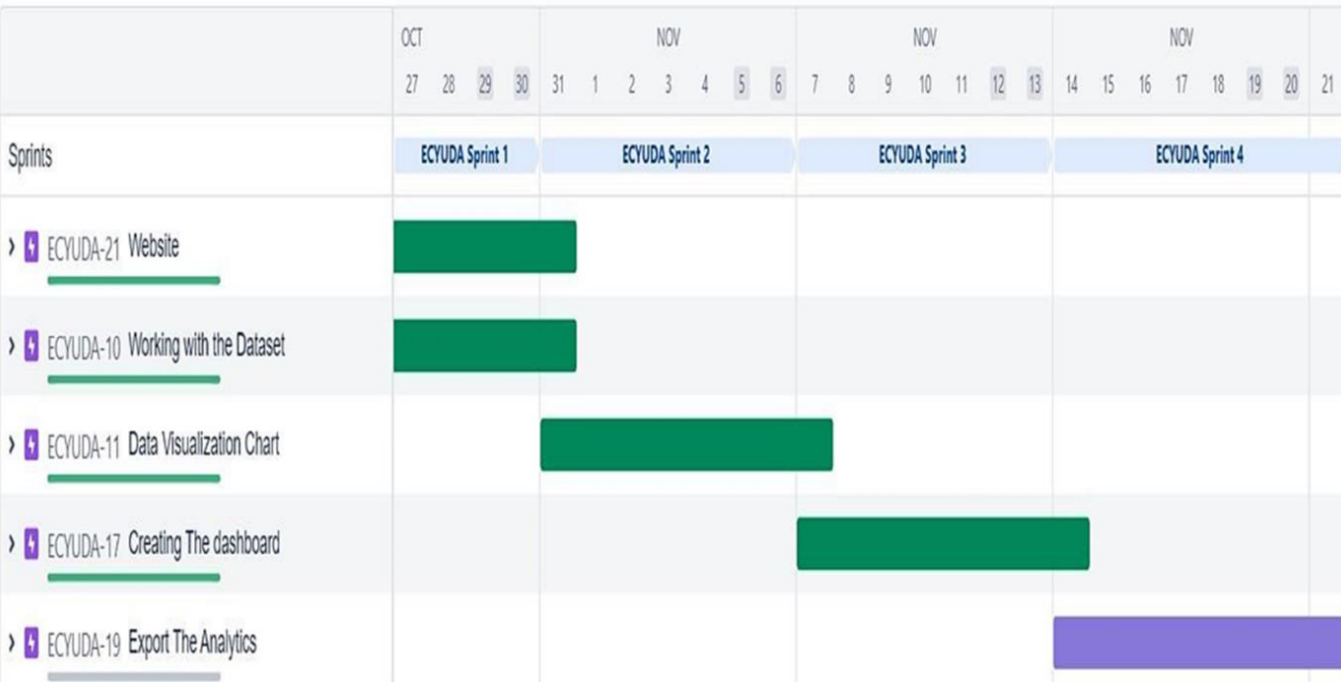
(I) BEFORE START OF THE SPRINT:

Sprints	OCT 27 28 29 30	NOV 31 1 2 3 4 5 6	NOV 7 8 9 10 11 12 13	NOV 14 15 16 17 18 19 20 21
	ECYUDA Sprint 1	ECYUDA Sprint 2	ECYUDA Sprint 3	ECYUDA Sprint 4
› ECYUDA-21 Website	███			
› ECYUDA-10 Working with the Dataset	███			
› ECYUDA-11 Data Visualization Chart		████		
› ECYUDA-17 Creating The dashboard			████	
› ECYUDA-19 Export The Analytics				████

(II) SPRINT 1:

Sprints	OCT 27 28 29 30	NOV 31 1 2 3 4 5 6	NOV 7 8 9 10 11 12 13	NOV 14 15 16 17 18 19 20 21
	ECYUDA Sprint 1	ECYUDA Sprint 2	ECYUDA Sprint 3	ECYUDA Sprint 4
› ECYUDA-21 Website	███			
› ECYUDA-10 Working with the Dataset	███			
› ECYUDA-11 Data Visualization Chart		████		
› ECYUDA-17 Creating The dashboard			████	
› ECYUDA-19 Export The Analytics				████

(III) SPRINT 2:

	OCT				NOV							NOV							NOV					
	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sprints	ECYUDA Sprint 1				ECYUDA Sprint 2							ECYUDA Sprint 3							ECYUDA Sprint 4							
› ECYUDA-21 Website																										
› ECYUDA-10 Working with the Dataset																										
› ECYUDA-11 Data Visualization Chart																										
› ECYUDA-17 Creating The dashboard																										
› ECYUDA-19 Export The Analytics																										

(IV) SPRINT 3:

	OCT				NOV							NOV							NOV					
	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sprints	ECYUDA Sprint 1				ECYUDA Sprint 2							ECYUDA Sprint 3							ECYUDA Sprint 4							
› ECYUDA-21 Website																										
› ECYUDA-10 Working with the Dataset																										
› ECYUDA-11 Data Visualization Chart																										
› ECYUDA-17 Creating The dashboard																										
› ECYUDA-19 Export The Analytics																										

(V) SPRINT 4:

7.CODING & SOLUTIONING

7.1 FEATURE 1

DASHBOARD DESIGN

The dashboard is created using IBM Cognos tool which efficiently visualises a given data. The design is incorporated along with login page and provides excellent insights on various data regarding crops.

```
<!DOCTYPE html>
<html lang="en">
<head>
 <meta charset="UTF-8">
 <title>Login Page</title>
```

```html
    <link href="https:/ fonts.googleapis.com/css?family=Open+Sans" rel="stylesheet">
<link href="https:/ maxcdn.bootstrapcdn.com/font-awesome/4.7.0/css/font-
awesome.min.css" rel="stylesheet" integrity="sha384-
wvfXpqpZZVQGK6TAh5PVlGOfQNHSoD2xbE+QkPxCAFlNEevoEH3Sl0sibVcO
QVnN" crossorigin="anonymous"><link rel="stylesheet" href="./style.css">
</head>
<body>
<!-- partial:index.partial.html -->
<div class="box-form">
<div class="left">
<div class="overlay">
<h2><p style="color:WHITE;"><CENTER>ESTIMATION OF CROP
YIELD USING DATAANALYTICS</p></h2></CENTER>
<span>
Login with
<a href="https:/ www.facebook.com/login/"><i class="fa fa-facebook" aria-
hidden="true"></i></a>
<a href="https:/ twitter.com/login"><i class="fa fa-twitter" aria-hidden="true"></i></a>
</span>
</div>
</div>
<div class="right">
<h1>Login</h1>
<div class="inputs">
<input type="text" placeholder="User name">
<br>
<input type="password" placeholder="Password">
</div>
<br><br>
<div class="remember-me--forget-password">
</div>
<br>
<a href="dashboard.html"><button>Login</button></a>
</div>
</div>
<!-- partial -->
</body>
</html>
```

7.2 FEATURE 2:

DATA FILTERS:

The filters used for classifying different parameters of the dataset can be efficiently done using the Cognos tool. The particular state with the specific crop can be visualized in the map

```html
<html>

<head>

<link rel="stylesheet"
href="https:/ cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css">

 <script src="https:/ cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>

 <script src="https:/
 cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></script>

<script
src="https:/ cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js"></script>
<style>

    .btn-group button {

      background-color: #04AA6D; /* Green

      background */ border: 1px solid green; /*

      Green border */

      color: white; /* White text */

      padding: 10px 24px; /* Some

      padding */cursor: pointer; /*

      Pointer/hand icon */

      float: center; /* Float the buttons side by side */

    }
/* Clear floats (clearfix hack) */
    }

 .btn-group button:not(:last-child) {

      border-right: none; /* Prevent double borders */

    }
/* Add a background color on hover */

   <h1><center> ESTIMATE THE CROP YIELD USING DATA
ANALYTICS</h1></center></h1></br>

   <div class="btn-group">

     <a href ="chart1.html"><button>Seasons with Average Productions</button></a>

     <a href ="chart2.html"><button>With Years of Area and Production</button></a>

     <a href ="chart3.html"><button>Top 10 States with Most Area</button></a>
```

```
    <a href ="chart4.html"><button>State with Crop Production</button></a>

    <a href ="chart5.html"><button>States with Crop Production Along with
Season</button></a>

  </div>

  </center>

   </br>

   </br> </br> </br> </br> </br>

<center></br>

<a
href="https:/
drive.google.com/file/d/1CCEVp6wT7ipkcx8okeSyVeMBTy2SSD1L/view?usp=s
haring" target="_blank">Report</a></br></br>

<a
href="https:/
us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.public_folders
%2
FCrop%2BYield%2BEstimation%2FData%2BVisualization&action=view&mode=d
ashboard&subVi              ew=model000001842c9d9287_00000002"
target="_blank">Live Dashboard</a></br></br>

  </center>

</body>

   </html>
```

8.TESTING

8.1 TEST CASES

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Result	status
Home Page _ TC_OO1	Functional	Homepage	Verify user is able to see the Login/Signup popup when user clicked on Login Button in the Homepage	1.Enter URL and click go 2. Click on Login Button 3. Verify login/Signup popup displayed or not	Login page should pop up as soon as the Login button is clicked	pass

Login page_ TC_OO2	U1	Login page	Verify the UI elements in Login/Signup popup	1.Enter URL and click go 2. Click on Login Button 3. Verify login/Signup popup with below UI elements: a.email text box password text box login button new customer? Create account link last password? Recovery password link	Application should show below UI elements: a.login with twitter & Facebook password text box login button with orange color last password? Recovery password link	Fail
Login Page_ TC_OO3	Functional	Dashboard page	Verify user is able to log into application with Valid credentials	1.Enter URL (login.html) and click go 2. Click on My Account dropdown button 3. Enter Valid username/email in email text box 4. Enter valid password in password text box 5. Click on login button	User should navigate to user account homepage	Pass
Login page_ TC_ OO4	Functional	Dashboard page	Verify user is able to view the dashboard and see the charts	1.Enter URL (dashboard.html) 2. Click on the different charts that the user wants 3.The embedded link will be able to display the charts from Cognos	Application should show the expected charts from Cognos	Pass

8.2 USER ACCEPTANCE TESTING

(I) PURPOSE OF DOCUMENT

The purpose of this document is to briefly explain the test coverage and open issues of the [Estimate the Crop Yield Using Data Analytics] project at the time of the release to User Acceptance Testing (UAT)

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	3	0	0	3

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	19
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	18	35
Not Reproduced	1	0	0	0	1
Skipped	0	0	1	1	2
Won't Fix	0	0	2	1	3
Totals	25	9	12	24	70

(II) TEST CASE ANALYSIS

This report shows the number of test cases that have passed, failed, and untested

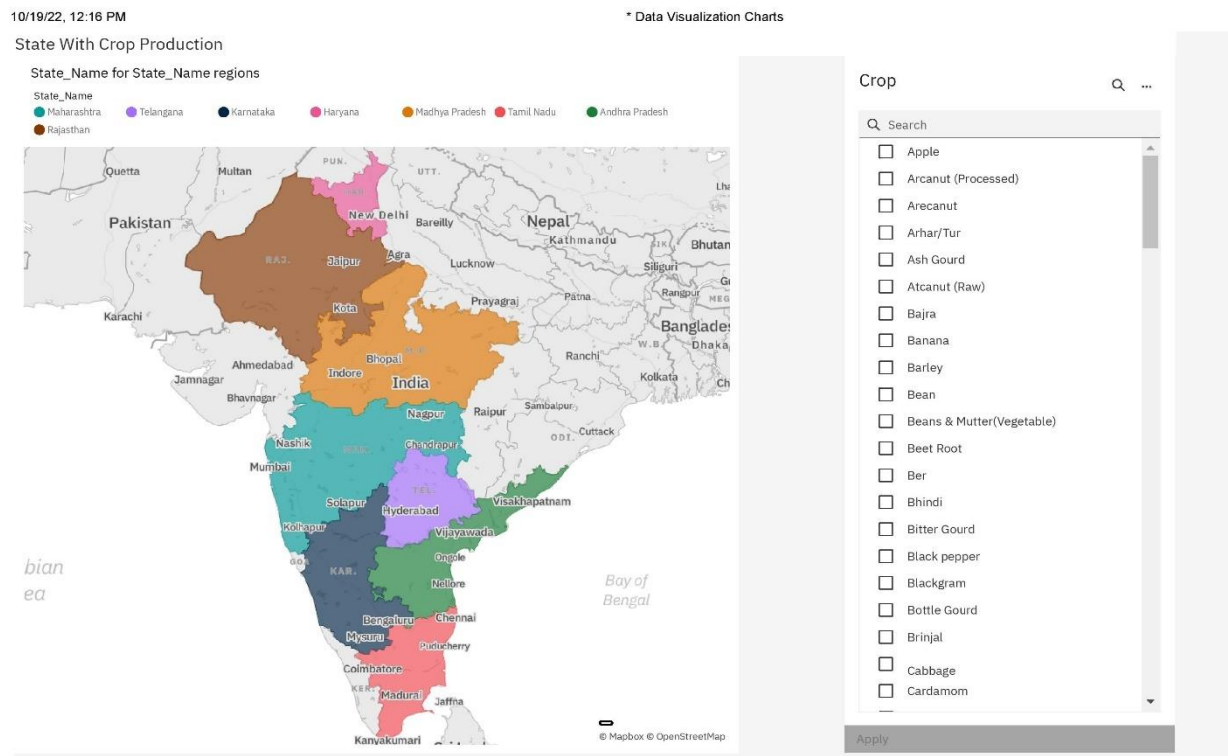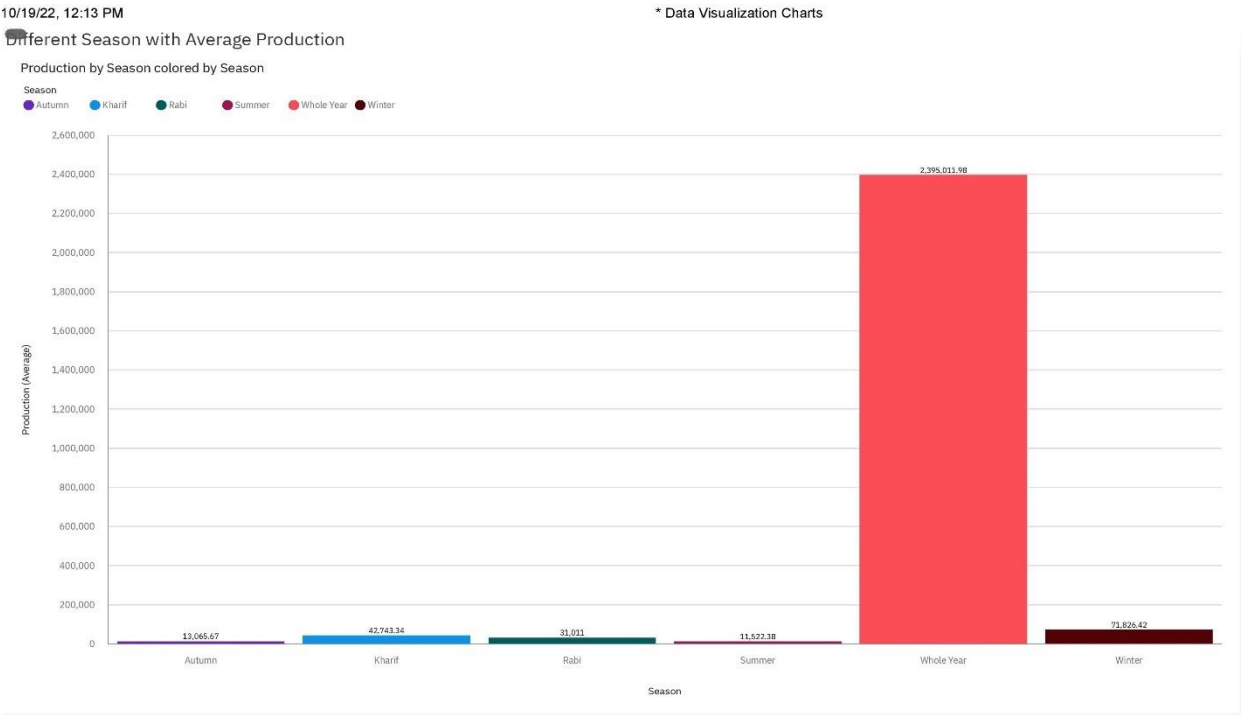| Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	5	0	0	4
Version Control	2	0	0	2

9.RESULTS

9.1 PERFORMANCE MATRICS

CREATING THE DASHBOARD
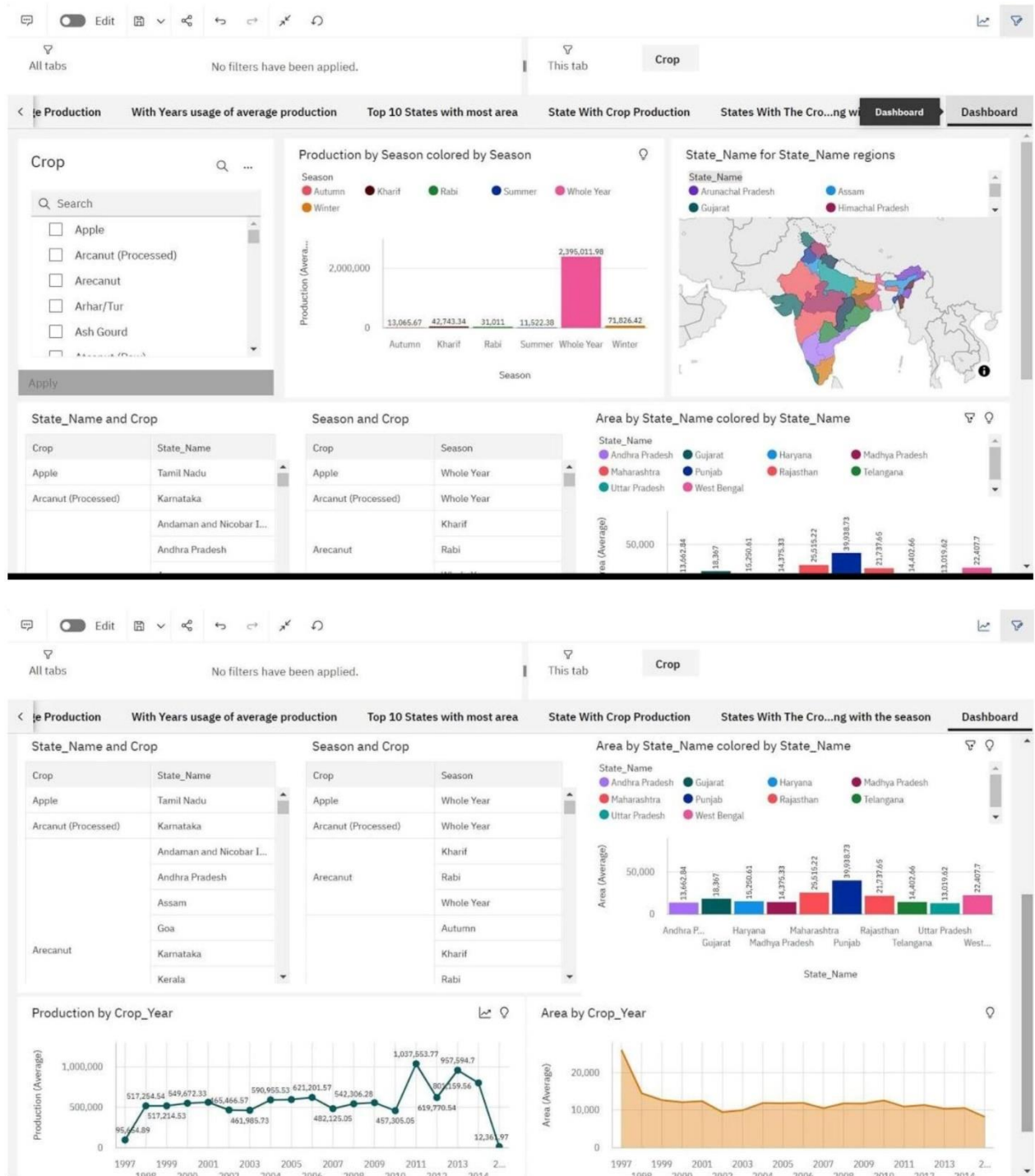
DATA VISUALIZATION CHARTS ON GIVEN DATASET OF CROP PRODUCTION

Different Season with Average Production

Production by Season colored by Season

Season
● Autumn ● Kharif ● Rabi ● Summer ● Whole Year ● Winter

State With Crop Production

State_Name for State_Name regions

State_Name
● Maharashtra ● Telangana ● Karnataka ● Haryana ● Madhya Pradesh ● Tamil Nadu ● Andhra Pradesh
● Rajasthan

States with the crop production along with seasons

State_Name and Crop

Crop	State_Name
Grapes	Andhra Pradesh
	Haryana
	Karnataka
	Madhya Pradesh
	Maharashtra
	Rajasthan
	Tamil Nadu
	Telangana

Season and Crop

Crop	Season
Grapes	Kharif
	Whole Year

Top 10 States With Most Area

Area by State_Name colored by State_Name

State_Name
● Andhra Pradesh ● Gujarat ● Haryana ● Madhya Pradesh ● Maharashtra ● Punjab ● Rajasthan ● Telangana ● Uttar Pradesh ● West Bengal
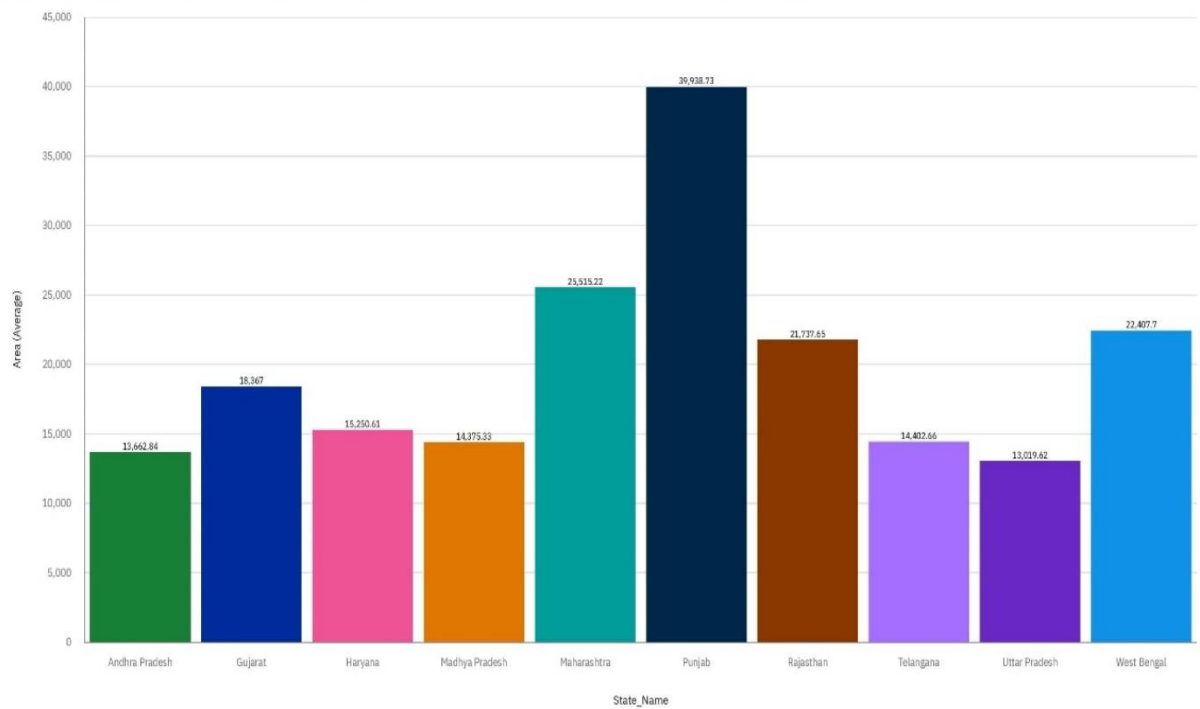
With years usage of Area and Production

Area by Crop_Year
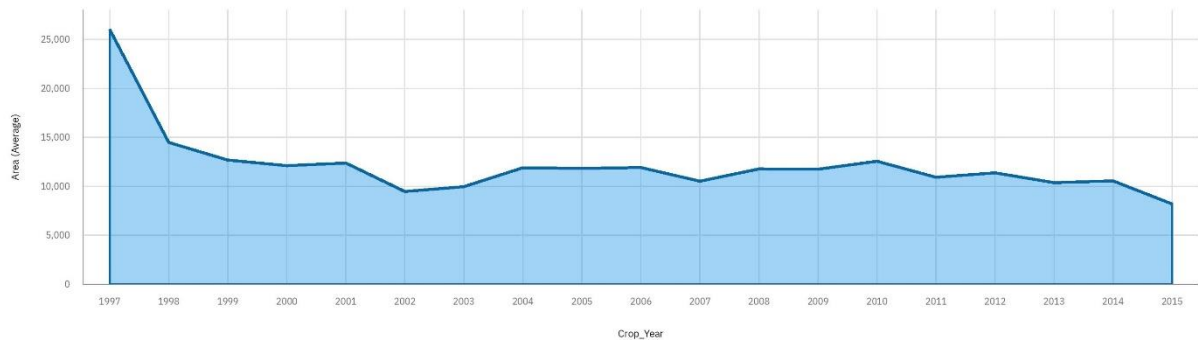
Production by Crop_Year
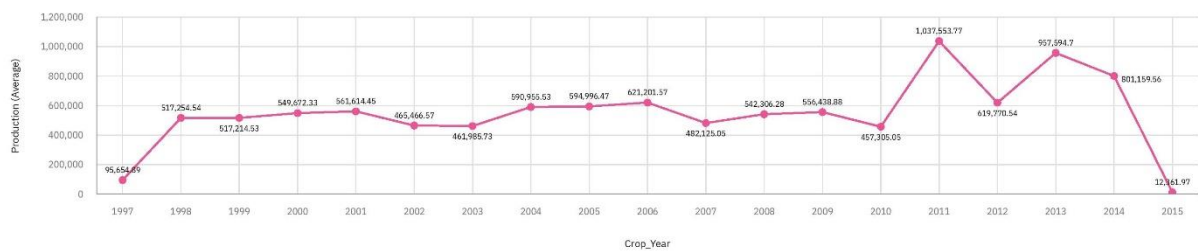
10.ADVANTAGES & DISADVANTAGES

ADVANTAGES

The advantage of this Crop yield estimation it is relatively less time-consuming and inexpensive. We can able to know the average productions of the crop, the amount of crop produced in different year and in different districts and in different area. And it is also used by farmers to make decisions about when to plant and harvest crops based on soil moisture content and weather conditions.

It allows us to predict which crops would be opportunity for a given climate. Using the weather and disease related data sets the crop quality can also be improved prediction algorithms help us to classify the data based on the disease and data extracted from the classifier is used to predict soil and crop

DISADVANTAGES

The disadvantage of the system is number of data used for the estimation are less. This method is highly subjective, as the information are collected from the farmers' knowledge and experience.

Due to the changing climatic conditions accurate results cannot be predicted by this condition

11.CONCLUSION

The proposed "ESTIMATE THE CROP YIELD USING DATA ANALYTICS" is used to predict the crop yield using the attributes such State_Name,District_Name,Crop_Year,Season,Crop,Area and Production. The proposed model is built with IBM Cognos Watson. As a result of penetration of technology into agricultural field, there is a marginal improvement in the productivity. The innovation has led to new concepts like digital agriculture, smart farming, precision agriculture etc. It has been observed that analysis has been done on crop, hidden pattern discovery using dataset related to season, area, production data. The activities of agriculture field are numerous like weather forecasting, soil quality assessment, seeds selection, crop yield prediction etc. In this survey, the specific activity, crop yield prediction has been surveyed and the major trends have been identified. It can be concluded that the research in the field of agriculture with reference to using IT trends like data analytics is in its infancy. As the food is the basic need of humans, the requirement of getting the maximum yields using optimal resource will become the necessity in near future as a result of growing population. The survey outcomes indicate the need for improved techniques in crop yield analytics. There exists a lot of research scope in this research area.

12.FUTURE SCOPE

The dashboard creation, visualization have taken lots of procedures and steps. The aim of the future work is to analyze the target attribute by reducing the number of procedures and steps. To improve the accuracy of the analysis algorithm selection procedure need to be optimized. As a future work, the results of the analysis can be improved, using the large number of crop datasets and more weather parameters. This can be also implemented in machine learning model to build in a strong yield prediction model and analysis of all the crops with different climatic conditions and different areas.

13.APPENDIX

13.1 SOURCE CODE

https://drive.google.com/drive/folders/1C7pdMAClCAqRnYSZ0M6oRx-U5Pj3fw3l?usp=sharing

13.2 GITHUB & PROJECT DEMO LINK

GITHUB

https://github.com/IBM-EPBL/IBM-Project-1827-1658416141

PROJECT DEMO

https://youtu.be/i5TxdV9hX5U

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