ESTIMATE THE CROP YIELD USING DATA ANALYTICS

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CHAPTER 1
INTRODUCTION

Agriculture is essential because it provides the foundation for food security. It is a well-known fact that India's populace is primarily engaged in agriculture. There are obstacles to expanding crop production in India because of weather changes. The task of achieving desired crop yield goals has grown difficult. Numerous elements that directly affect the yield and productivity of the crops must be taken into account. One of the crucial aspects of agricultural techniques is the forecast of crop production.

The records of previous crop yields is maintained through crop yield prediction, which benefits farmers in a variety of ways. Before planting seeds in their fields, farmers require knowledge about crop yield in order to increase agricultural output. In recent years, the use of technology in agriculture has increased, and one such development is the use of data analytics. Identifying the efficiency of big data analytics is the key difficulty in employing big data in agriculture. It is being researched how big data analytics might increase agricultural 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. The data when become information is highly useful for many purposes. IBM Cognos Business Intelligence is a web-based integrated business intelligence suite by IBM. It provides a toolset for reporting, analytics, score carding, and monitoring of events and metrics. The software consists of several components designed to meet the different information requirements in a company. IBM Cognos has components such as IBM Cognos Framework Manager, IBM Cognos Cube Designer. IBM Cognos Transformer. Cognos Analysis Studio helps business users get fast answers to business-related queries. Reporting studio allows you to create pixel-perfect reports for your organization. Cognos event studio allows you to assign a specific event that sends a notification to the stakeholder in your organization. Cognos Metric Studio allows you to monitor and analyse business metrices of your organization by building a scorecard environment.

1.1 Project Overview:

India is one of the top countries for agricultural production, making it one of the most significant sources of income. As part of this project, we will analyse certain key visualisations, build a dashboard, and then use this information to gain the majority of insights about crop production in India and, as a result, boost farmer yield

Predicting crop yields is a significant agricultural issue. Every farmer strives to understand how much of his expected output he will actually receive. Previously, yield predictions were made by analysing farmers' prior experience with a particular crop. The agricultural production is mostly influenced by the weather, pests, and harvest operation planning. Making judgments regarding agricultural risk management requires accurate knowledge of crop yield history.

After the groundwork has been done, in-season data offers insight into factors that influence yield all during the growing season. By providing expected and forecast values that are kept and then reset when new data is received each day,

Farmers Edge on-farm weather stations provide field-centric data that improves these datasets and advances the models. To enhance field diagnostics and provide predict production estimates, other in-season data, such as fertiliser use during the season, whether scheduled or not, is also taken into account.

To create the foundation for yield prediction, preseason data must be precise. This knowledge is accessible prior to the crop being planted, and it sets the stage for the initial readings of yield prediction. In order to provide insight into how to start the season with accurate yield numbers to anticipate, data including a field's location, current and previous crops, field-specific weather months before planting or seeding, soil test information and data, and regional weather trends over the last decade are all combined.

1.2 Purpose:

It has been noted that farmers are having issues with agricultural productivity due to the fast fluctuations in the weather, which have an impact on crop yield. decrease the crop's quality, which will result in less money for the farmers. The goal of this project is to increase crop quality so that farmers may make more money. We have gathered the datasets for all the variables that affect the crops across a number of years for this project. With the use of this information, it is possible to anticipate when the crop that is expanding in that area will be harvested.

Accurate, early estimation of grain yield is an important skill. Farmers require accurate yield estimates for a number of reasons:

- crop insurance purposes
- delivery estimates
- planning harvest and storage requirements
- cash-flow budgeting

A sufficient number of counts must be made in order to obtain a representative average of the paddock if yield estimations are to be accurate. The estimated yield is simply intended as a guide, and there is some ambiguity in the assumptions that were drawn from it. One of the simplest and quickest yield estimation methods, it can be applied in a variety of circumstances on a grain-growing property. Farmers and others can estimate the yield of different crops using a variety of approaches. Some are simple, while others are more challenging. The approach described here is one that may be used rather fast and simply.

CHAPTER 2
LITERATURE SURVEY

Dr M S Shirdhonkar and Dhakshayini S, "Rice yield Crop Prediction". Journal of Intelligent Systems, 2021, Prediction of crop yield is significant in order to accurately meet market requirements and proper administration of agricultural activities directed towards enhancement in yield. Several parameters such as weather, pests, biophysical and morphological features merit their consideration while determining the yield. However, these parameters are uncertain in their nature, thus making the determined amount of yield to be approximate. It is exactly here that the logic comes into play. This paper elaborates an attempt to develop inference systems for crop yield prediction. Physio morphological features of Sorghum were considered. A huge database (around 1000 records) of physio morphological features such as days of 50 percent flowering, dead heart percentage, plant height, panicle length, panicle weight and number of primaries and the corresponding yield were considered for the development of the model. In order to find out the sensitivity of parameters, one-to-one, two-to-one and three-to one combinations of input and

output were considered. The results have clearly shown that panicle length contributes forth yield as the lone parameter with almost one-to-one matching between predicted yield and actual value while panicle length and panicle weight in combination seemed to play a decisive role in contributing for the yield with the prediction accuracy reflected by very low RMS value.

Dhivya B and Shiva Bharathi S "A survey on Crop yield production", Anna University, Trichy, Tamilnadu, India, 2021. Recent developments in Information Technology for agriculture field have become an interesting research area to predict the crop yield. In today's world, the amount of information stored has been enormously increasing day by day which is generally in the unstructured form and cannot be used for any processing to extract useful information using mining technique. This paper presents a brief analysis of data mining methods and agriculture techniques, farm types, soil types, prediction using Multiple Linear Regression technique for the selected region. This work mainly focuses on analyzing the agricultural analysis of organic farming and inorganic farming, time cultivation of the plant, profit and loss of the data and analyzes the real estate business land in a specific area and comparison of irrigated and unirrigated land. It concentrates organic, inorganic and real estate data sets from which the prediction in agriculture will be achieved. The purpose is to estimate difference in efficiency and prediction between organic and inorganic farming. This work aims at finding suitable data models that achieve a high accuracy and a high generality in terms of yield prediction capabilities.

2.1 Existing problem:

Other than blogging websites which provide information about the agriculture and agricultural accessories, there is no particular website for predicting the yield of the crop depending on the history in that specific geographical region.

2.2 Reference:

1. Dhivya B H, Manjula R, Siva Bharathi S, Madhumathi R. A Survey on Crop Yield Prediction based on Agricultural Data, International Journal of Innovative Research in Science, Engineering and Technology. 2021.
2. Jharna Majumdar, Sneha Naraseeyappa, Shilpa Ankalaki. Analysis of agriculture data using datamining techniques: application of big data. Journal of Big data. 2020.
3. Majumdar J, Ankalaki S. Comparison of clustering algorithms using quality metrics with invariant features extracted from plant leaves. International Conference on Computational Science and Engineering. 2020.
4. D Ramesh, B Vishnu Vardhan. Data Mining Techniques and Applications to Agricultural Yield Data. International Journal of Advanced Research in Computer and Communication Engineering. 2019.
5. Swarupa Rani. The Impact of Data Analytics in Crop Management based on Weather Conditions. International Journal of Engineering Technology Science and Research. 2019.

2.3 Problem Statement Definition:

1.What are the issues in crop yield?

In this generation many people didn’t know about the crop yielding

process but they want to know but they don’t have time to see the yielding areas and some business people didn’t know many yielding areas to buy the product for their factories then for the farmers don’t know about the demanding products for yield and are all some issues.

2.When the issues occur?

During climate changes common people don’t know about the seasonal crops and some formers don’t have knowledge about importing the demand product.

3.Why we need to solve this problem?

Farmers get more profit about knowing importing and demanding product and business people can expand the factory and export many product and some people who want to know about crop can get more information about crops.

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas:

The IBM cognos portal was used to construct the empathy map. It includes information on the crop covered area and agricultural yield in India broken down by state, district, crop, season, and year. Area attributes in this dataset are measured in hectares, and crop production attributes are recorded in tonnes per hectare. The pre-processing step is where the work begins. The acquired data underwent preprocessing in this step. The majority of the data from the data set was gathered for pre-processing. Districts in Tamil Nadu, India, are the subject of the preliminary data gathering. The appropriate longitude and latitude of the region are used to identify each area in this collection.

It contains information on fourteen districts in Kerala, such as crop name, area, productivity, temperature, rainfall, humidity, and wind speed. The preprocessing of the data produced the precise dataset that was required. The yield and productivity of any crop are impacted by a wide range of variables. These are essentially the characteristics that aid in estimating a crop's annual yield.

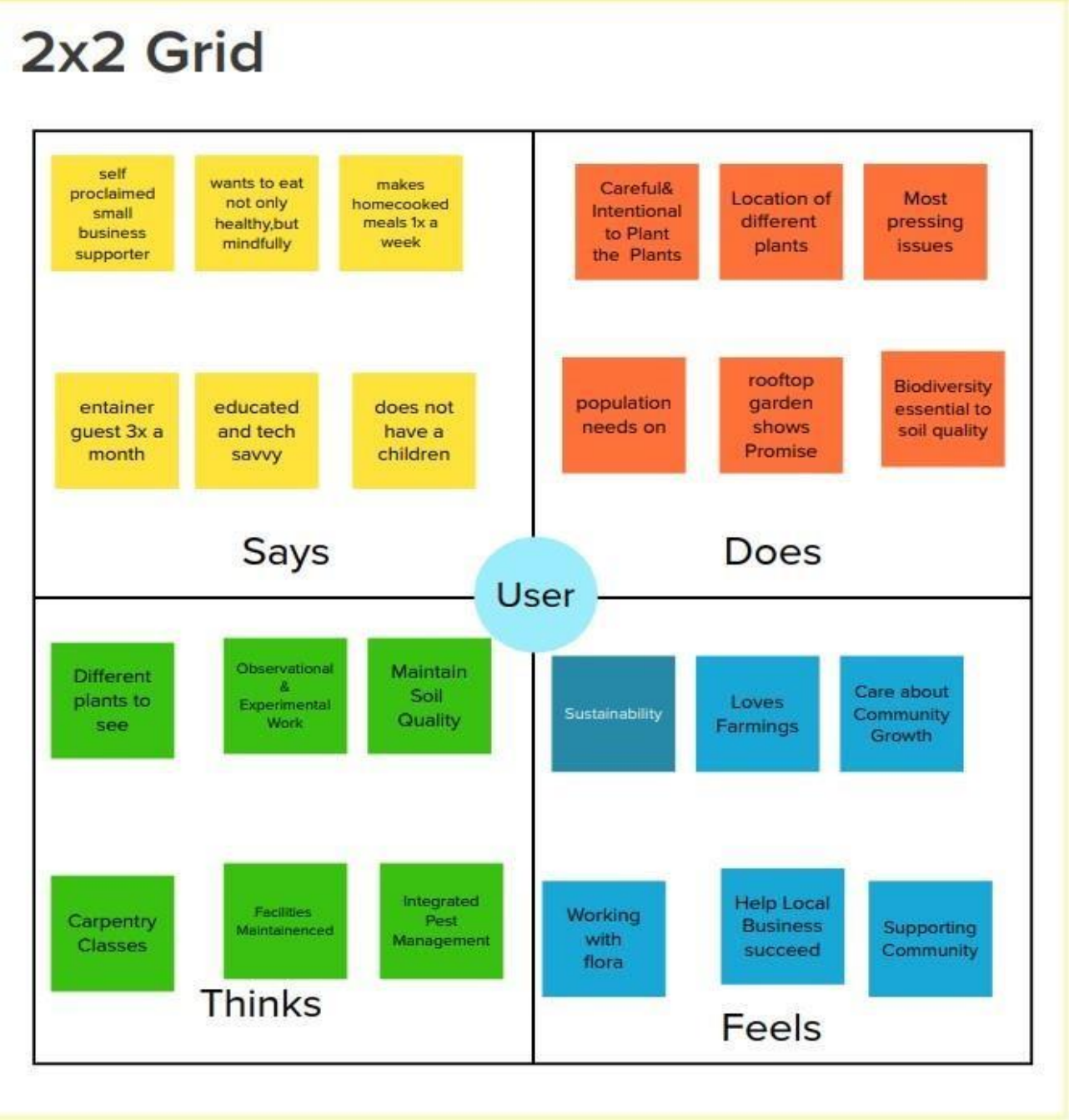


Fig 3.1 Empathy map diagram

3.2 Ideation & Brainstorming:

Agriculture is crucial for human survival in India because it meets a fundamental requirement. Crop output is rising in India as a result of varying climatic circumstances. There are several variables to take into account that directly affect the crop's productivity and yield.

The dashboard for estimating the crop yield is using data analytics and the first phase is farmer, they want to know what are demand of crops. Second phase is business person, they wants to know the level of crop yielding in a particular area.

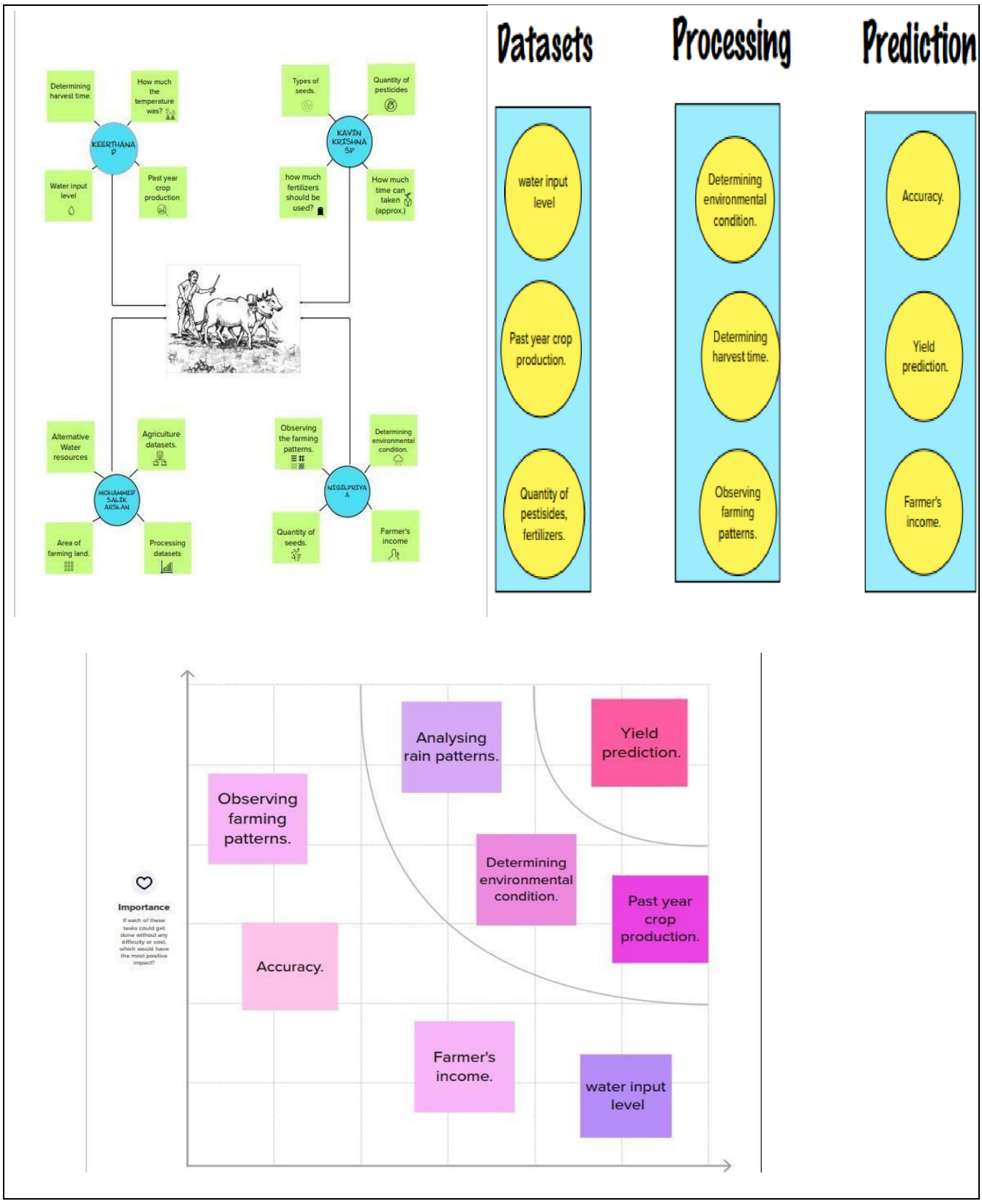


Fig 3.2 Brainstorming diagram

Third phase people want to know what are the crops grows in our nearby areas are not. Fourth phase people do not know whether the farming is done in our areas.

Farmers need information regarding crop yield before sowing seeds in their field to achieve enhanced crop yield.

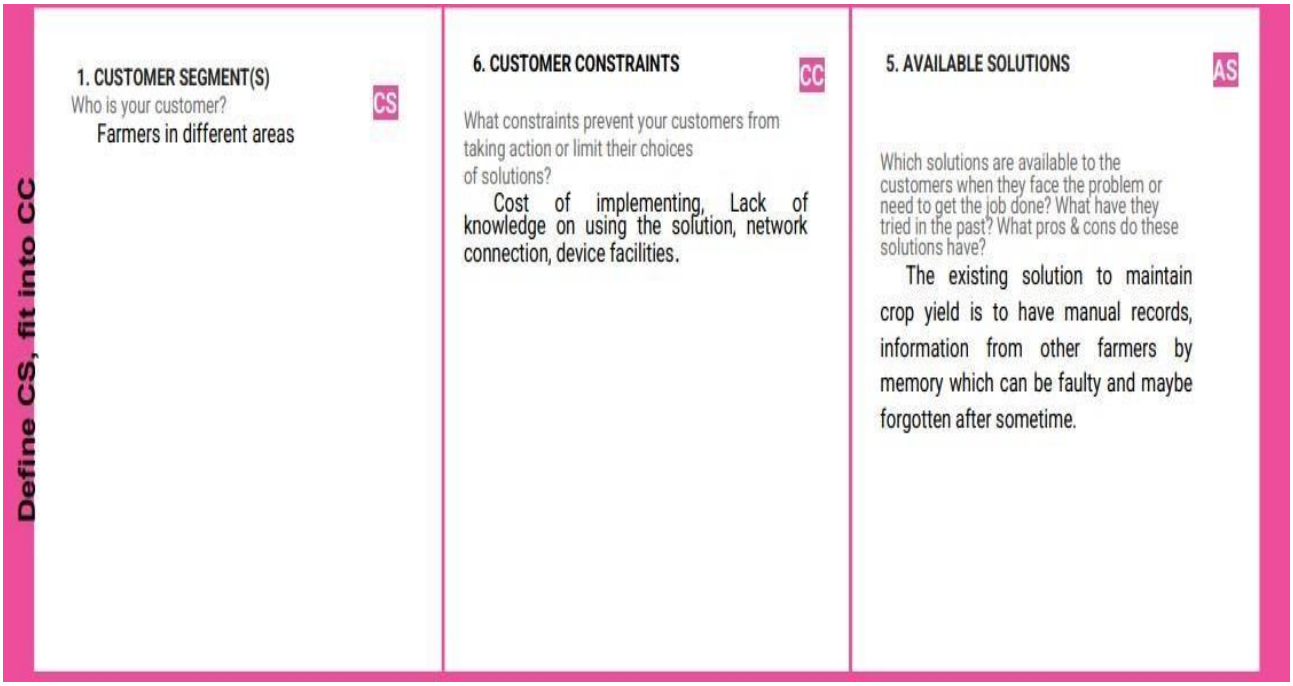
The us of technology in agriculture is increase in recent years and data analytics is one such trend that has penetrated into the agriculture field. Application model like fuzzy logic designs in optimization and validation of crop yield.

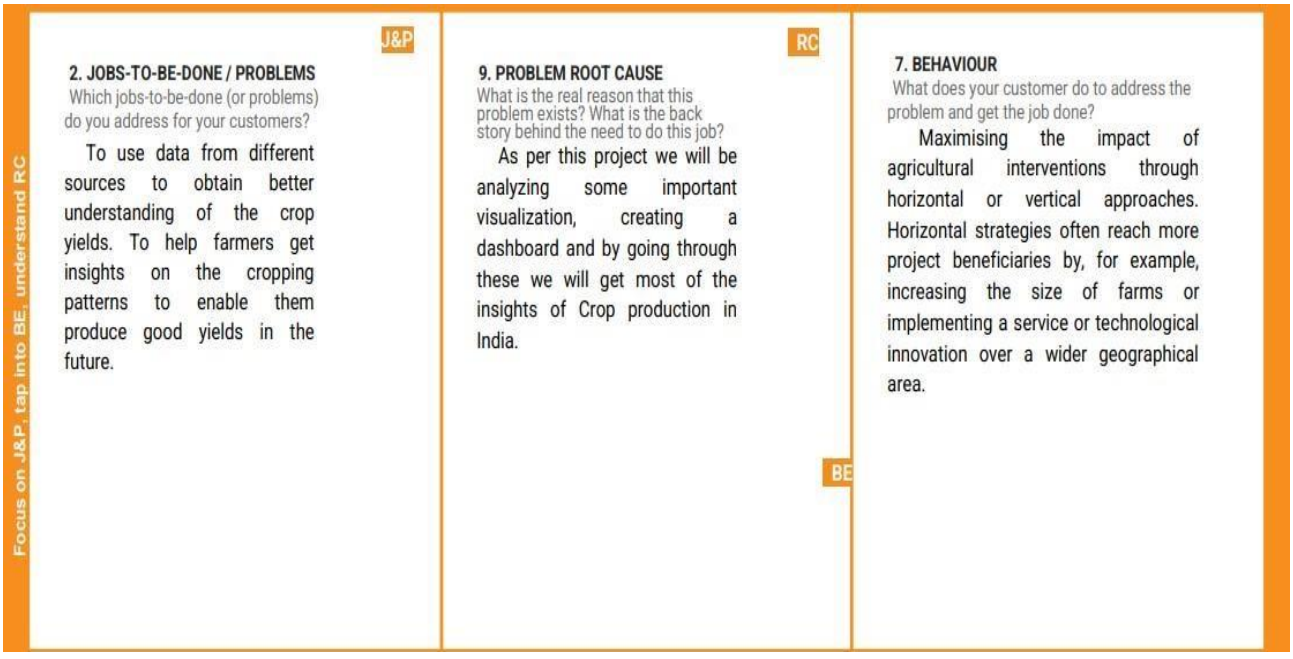
The present study give insight on various data analytics method apply to crop yield production. It signifies the importance of points in the proposed area of research. It has the different algorithms applied for prediction of crop yield.

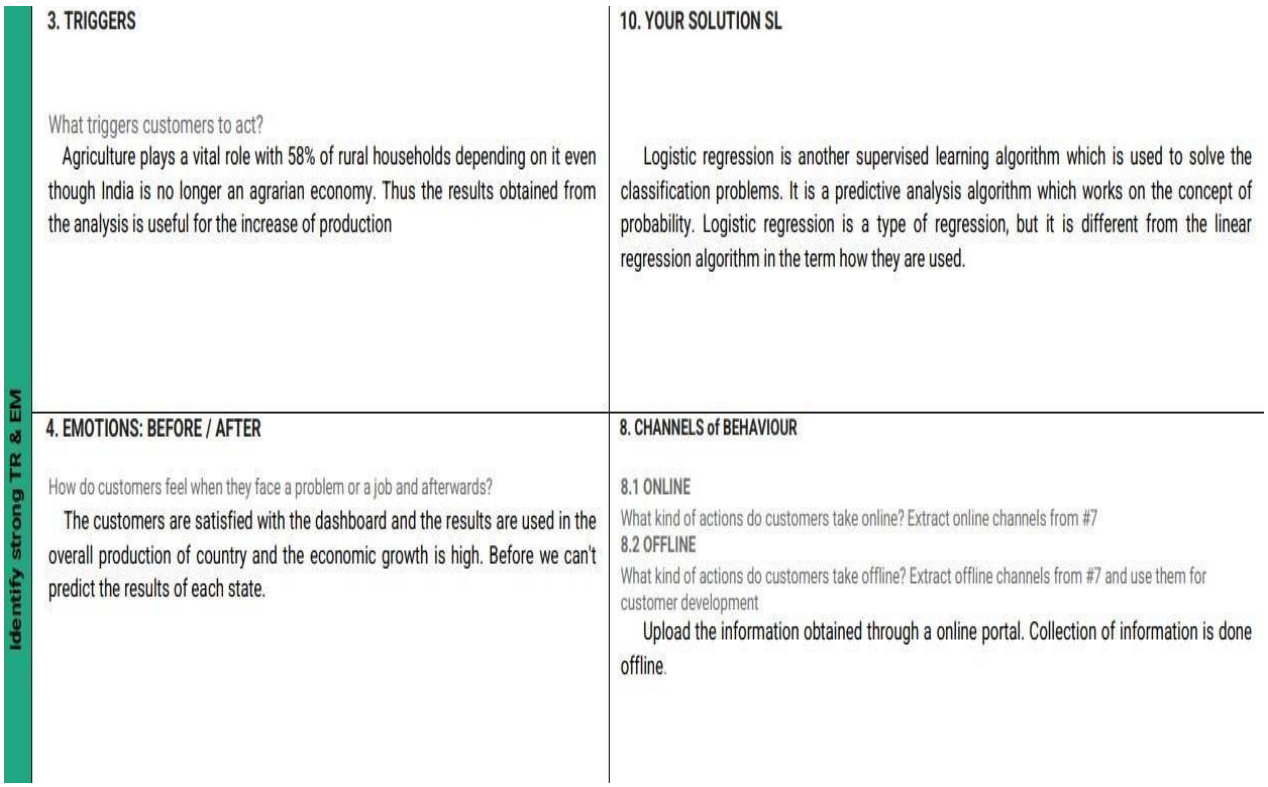
3.3 Proposed Solution:

In our project, there are four phases of people to describe our project problems. First phase people is Farmer, they wants to know what are the demand of crops. Second phase people is Business person, they wants to know the level of crop yielding in a particular area to satisfy their needs in season. Third phase people want to know what are the crops grows in our nearby area. Fourth phase people does not know whether the farming is done in nearby areas or not. So, all the four phases people's problem have been solve by our project idea. As for the farmers demand of crops can be rectify by dashboard estimation and they also know the import and export product by dashboard. As for the business persons, they can see high yielding product for their factories and they can also estimate the high importing yielding product. Then, for third phase people can know what type of crops yield in nearby area and also know the sum of crop yield in particular area by using this dashboard. And the last phase people can know whether the crops are yield in their own area and they also can check estimation crop yield in any area. So, this are some problems we occur in our project and solution is done by the dashboard for estimate the crop yield using Data Analytics.

3.4 Problem Solution fit:







CHAPTER 4

REQUIREMENT ANALYSIS

Software prerequisite The core of the software development process is a fundamental document called a specification. It includes a description of a system's key feature in addition to a list of the system's needs. Before beginning any actual design or development work, a software requirement specification is essentially an organization's understanding of a customer's or potential client's system requirements and dependencies at a specific time.

It is a two-way insurance policy that guarantees that the client and the company, at any given time, are both aware of the other's requirements from that perspective. In addition, the software requirement definition serves as a guide for finishing a project with minimal cost growth. Because all subsequent project management documents, including design specifications, statements of work, software architecture specifications, testing and validation plans, and documentation

plans, are connected to the software requirement specification, it is frequently referred to as the parent document.

The software requirement specification only contains functional and nonfunctional requirements; it does not offer design recommendations, potential answers to technological or commercial problems, or any other information aside from what the development team believes the customer's system requirements to be.

The user requirements specification is a document that is frequently used in software engineering that lists the needs that a user has for the programme that will be developed. A user requirements specification, which serves to specify in detail what the programme must accomplish, is created once all the necessary data has been obtained and becomes a part of the contract.

Customers cannot request features that are not listed in the user requirements specification, and developers cannot declare a product to be ready if it does not adhere to all of the user requirements. The user requirements specification can be used as a reference when budgeting, creating schedules, setting goals, testing, and other tasks. Customers can display the user requirements specification to various stakeholders to ensure that all necessary features are covered because it is explicit in nature.

Negotiation is necessary when creating a user needs specification to ascertain what is technically and financially viable. One of those abilities that sits somewhere between a science and something that can be done affordably is creating a user requirements specification. One of those abilities that straddles the line between a science and an art is creating a user requirements specification. It calls for both interpersonal and technical knowledge of software.

4.1 Functional requirement:

A functional requirement specifies how a software system should operate and respond to particular inputs or circumstances. Calculations, data processing, and

other specialised functionality may be among them. The functional criteria for this system are There must not be any compilation or runtime issues in the input test case. Even if the application is left running for a very long time, it must not cease to function.

For each set of test cases offered, the application must perform as expected. For the input test case and input parameters that are provided, the application must produce the output. On-demand services should be produced by the application. Functional requirements often take the form of a system shall do requirement, a specific action taken by a component of the system, maybe explicitly in the sense of a mathematical function, and a black box description of the input, output, process, and control functional model.

The practise of tying tactical goals and objectives to strategic goals and objectives is known as an operational need. It explains how, or what portion of, a strategic plan will be put into operation during a given operational period, in the case of a commercial application, a fiscal year or another given budgetary term. It also describes milestones, conditions for success, and how a strategic plan will be put into operation during a given operational period.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through Whatsapp Registration through Agri-Consultancy
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP Confirmation via Letter
FR-3	User Profile	User Details Farm Details
FR-4	Required Data	The past crop yield data the user(Farmer) data to analyse
FR-5	Analysis	Clean and analyse the data according to the set of past data of the multiple users(Farmer)
FR-6	Estimation	Creating the perfect data module, visuals using IBM Cognos to increase the estimation of the crop yield

Table 4.1 Functional requirement

4.2 Non-Functional requirement:

Non-functional requirements are those that have no direct bearing on the particular function that the system provides. In place of specific behaviours, they define the standards that can be used to evaluate how a system works. They might be connected to characteristics of emergent systems including dependability, response time.

Non-functional requirements might be caused by external circumstances, user needs, financial restrictions, organisational regulations, the necessity for system interoperability with other software and hardware, or organisational policies. Nonfunctional requirements, on the other hand, take the form of system shall be requirements and are not specific functions but rather general characteristics of the system as a whole or of a single aspect.

The general characteristics of the systems frequently determine whether a development project is a success or a failure. Non-functional requirements are frequently referred to as a system's attributes. Execution quality and evolution quality are two categories for these criteria. Execution qualities, which are noticed during

system operation, include security and usability, while evolution qualities include testability, maintainability, extensibility, and scalability.

A non-functional requirement is one that describes criteria rather than specific behaviours that can be used to evaluate how well a system performs. Functional requirements, on the other hand, define particular behaviours or functions. The system architecture provides specifics on how non-functional requirements will be implemented. In general, non-functional requirements describe the how of a system, while functional requirements describe what a system is expected to do.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	According to the past data itself, data report is created.By these recommendation the sowing of crops will be advised or consulted
NFR-2	**Security**	IBM Cognos have a secure user information(Data Visuals)
NFR-3	**Reliability**	The interactive data visuals dashboard can make easily understandable of the data report
NFR-4	**Performance**	Interaction makes better performance between all user and impressing by the visual advise
NFR-5	**Availability**	The dashboard could be easily viewed and available in every smartphones, laptops, systems etc..
NFR-6	**Scalability**	The flexibility of the methodology to implement the proposed solution is very easy that can make increase in the estimation of crop yield in the differ farms for different user

Table 4.2 Non-functional requirement

CHAPTER 5

PROJECT DESIGN

5.1 Data flow diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount

of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

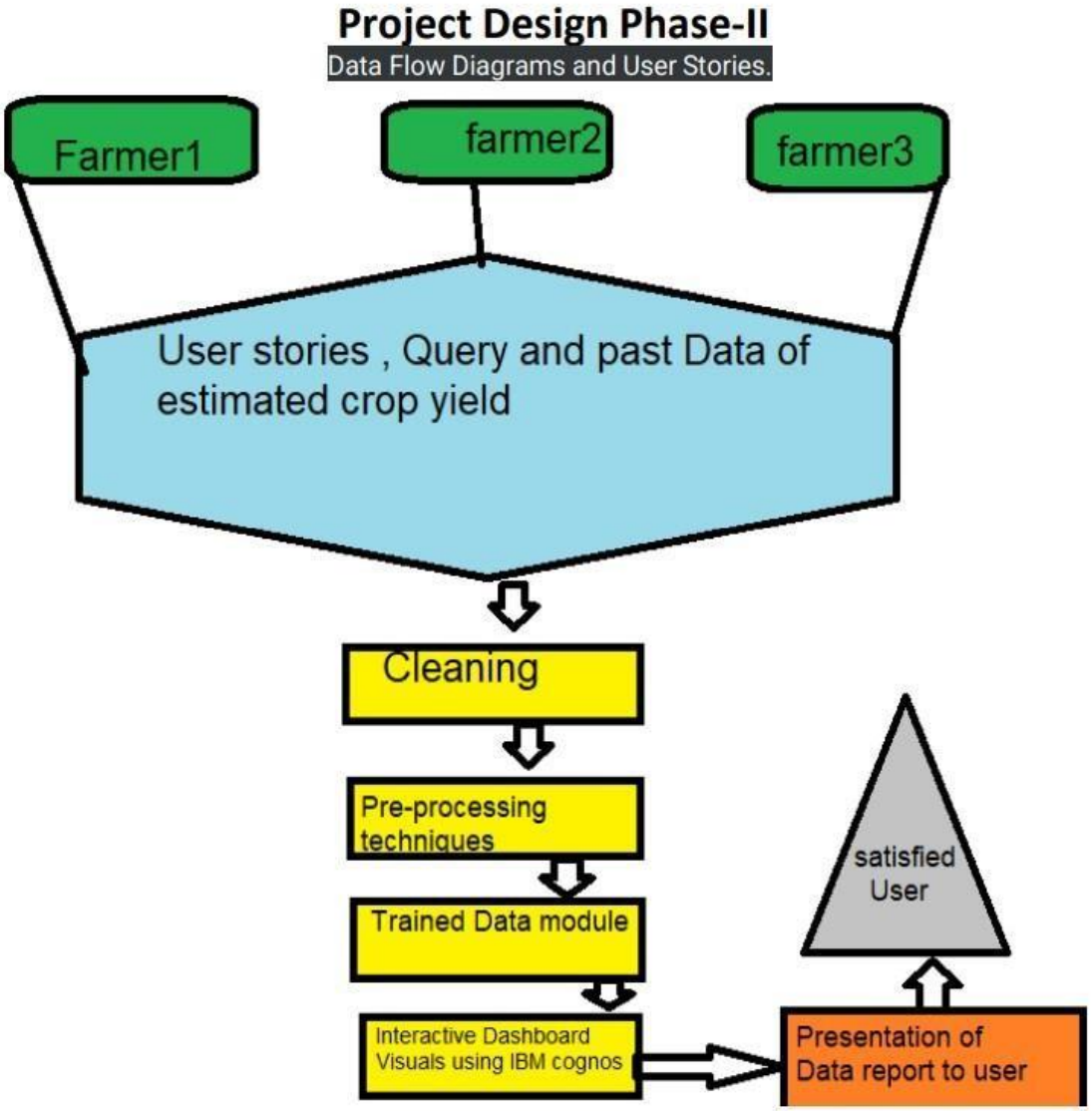


Fig 5.1 Data flow diagram

5.2 Solution &Technical architecture:

5.2.1 Solution architecture:

Solution architecture is a complex process with many subprocesses that bridge the gap between business problem and technology solution. Its goals are

to:

Finding the best technical solutions to solve existing business problems.

Explain the stakeholders the structure, properties, behavior, and other aspects of the software.

Define features, development phases, and solution requirements.

Provide specifications according to which the solution is defined, managed, and delivered

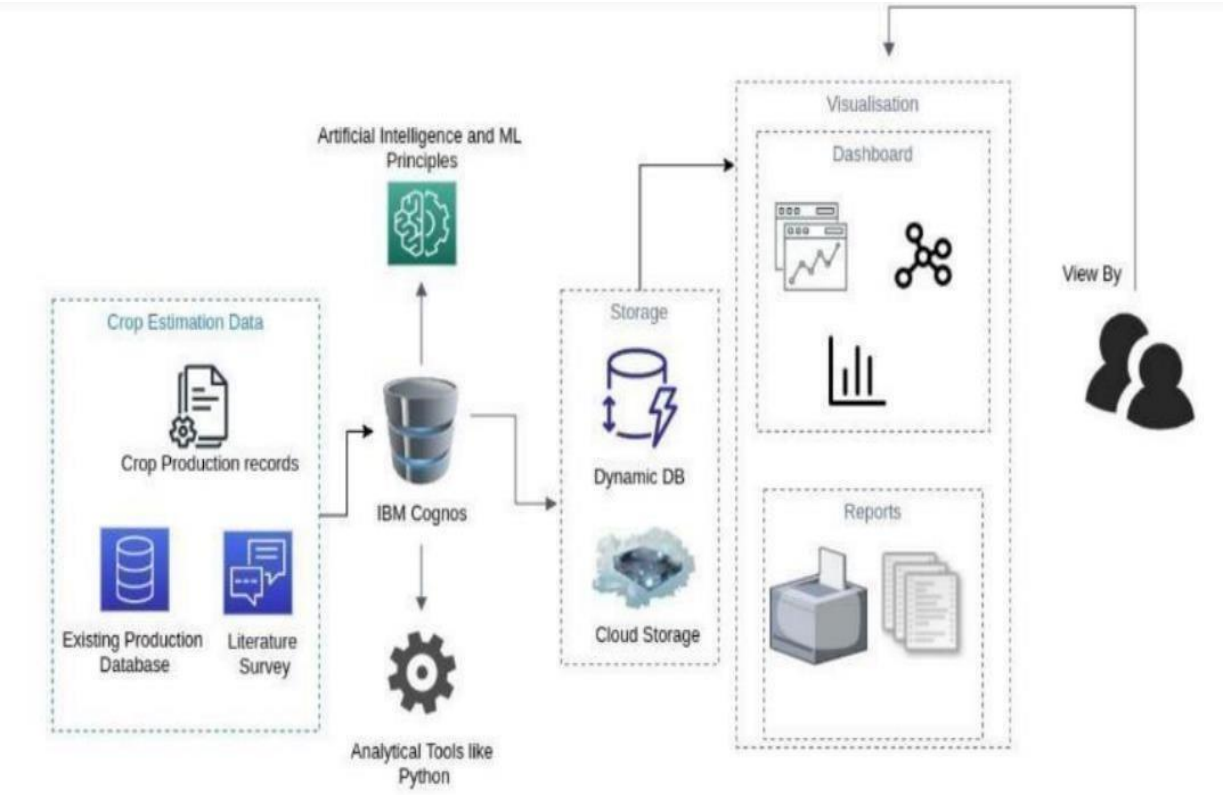


Fig 5.2.1 Solution architecture

5.2.2 Technical architecture:

Data is retrieved from the user, data is analyzed, cleaned, preprocessed, etc. A data report is generated. IBM Cognos is used to generate visual data according to data reports created using user data. This can lead to big changes in ferries, yield estimates, and frame profits.

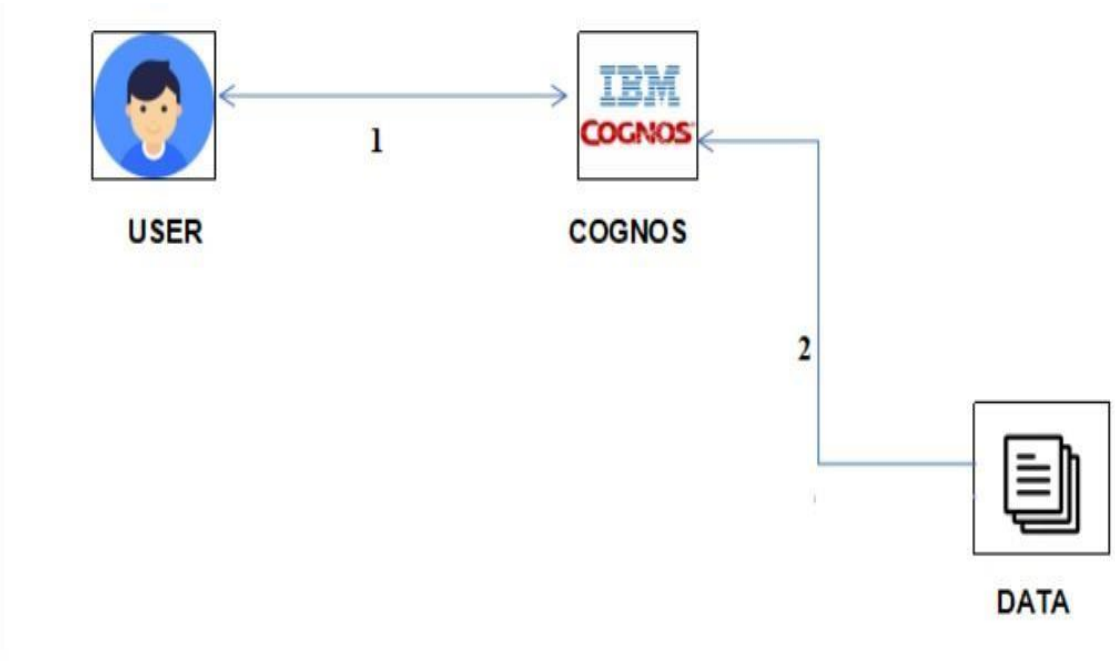


Fig 5.2.2 Technical Architecture

5.3 User stories:

A user story defines a set of targeted interactions between the external entity under consideration and the system. Any external entity that interacts with the system is its actor. Many user stories describe the full functionality of the system at a certain level of detail and can be represented graphically through tables. A list of all user stories for the product. Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (mobile user)	Registration	USN-1	user can register for the application by entering my email and password.	User can access the platform and account.	High	Sprint-1
		USN-2	User will receive email if the registration is successful. That the registration has conformed.	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through web browser.	I can register & access the dashboard with browser Login.	Low	Sprint-2
	Registration through email.	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	I can access the dashboard of mine.		medium	Sprint-2
Customer (Web user)	Activity	USN-7	I can register for the application through any web browser.	I can get an notification from the browser.	low	Sprint-1
	Access resources	USN-8	I can use my credentials For accessing my resources.	Other than me, there is less chance to access my resources.	high	Sprint-1
	Satellite visioning	USN-9	As, a user I can vision the geographic area.		medium	Sprint-2
Customer tools	Tools	USN-10	I can perform analysis by tools(cognos and with ML)	I have an ease of accessing tools.	high	Sprint-1

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation:

In the scrum process, sprint planning marks the beginning of the sprint. Sprint planning's goal is to specify what can be completed in a sprint and how it will be done. The entire scrum team collaborates on sprint planning. The sprint planning meeting establishes the focus and agenda for the sprint. If done well, it also produces a setting in which the team is inspired, challenged, and capable of success.

6.1.1 Product Backlog, Sprint Schedule, and Estimation:

Template to create product backlog and sprint 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	BALAJI K
		USN-3	As a user, I can register for the application through Gmail	2	Medium	AKASH S
	Login	USN-4	As a user, I can Call and request or Approach for dataset	2	High	JAIMISAL
	Working with the Dataset	USN-5	To work on the given dataset, Understand the Dataset.	2	High	AKASH S BALAJI K
		USN-6	Load the dataset to Cloud platform then Build the required Visualizations.	10	High	BALAJI K AKASH K
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	JAIMISAL DHANESH
			*Showcase the Yearly usage of Area in Crop Production.	4	Medium	DAHNESH AKASH S

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	BALAJI K AKASH S JAIMISAL
			Build the required Visualization to showcase the Crop Production by State.	4	Medium	BALAJI K AKASH S
			Build Visual analytics to represent the Sates with Seasonal Crop Production using a Text representation.	4	Medium	BALAJI K AKASH S DHANESH
Sprint-3	Creating The dashboard	USN-8	Create the Dashboard by using the created visualizations.	20	High	BALAJI K JAIMISAL AKASH S
Sprint-4	Export The Analytics	USN-9	Export the created Dashboard	20	High	BALAJI K AKASH S

Table 6.1.1 Sprint schedule table

6.2 Sprint Delivery Schedule:

6.2.1 Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	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

Table 6.1.2 Project tracker table

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**

AV =Sprint Duration = 24/20 =1.2

6.3 Reports from JIRA:

6.1.3 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 such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.

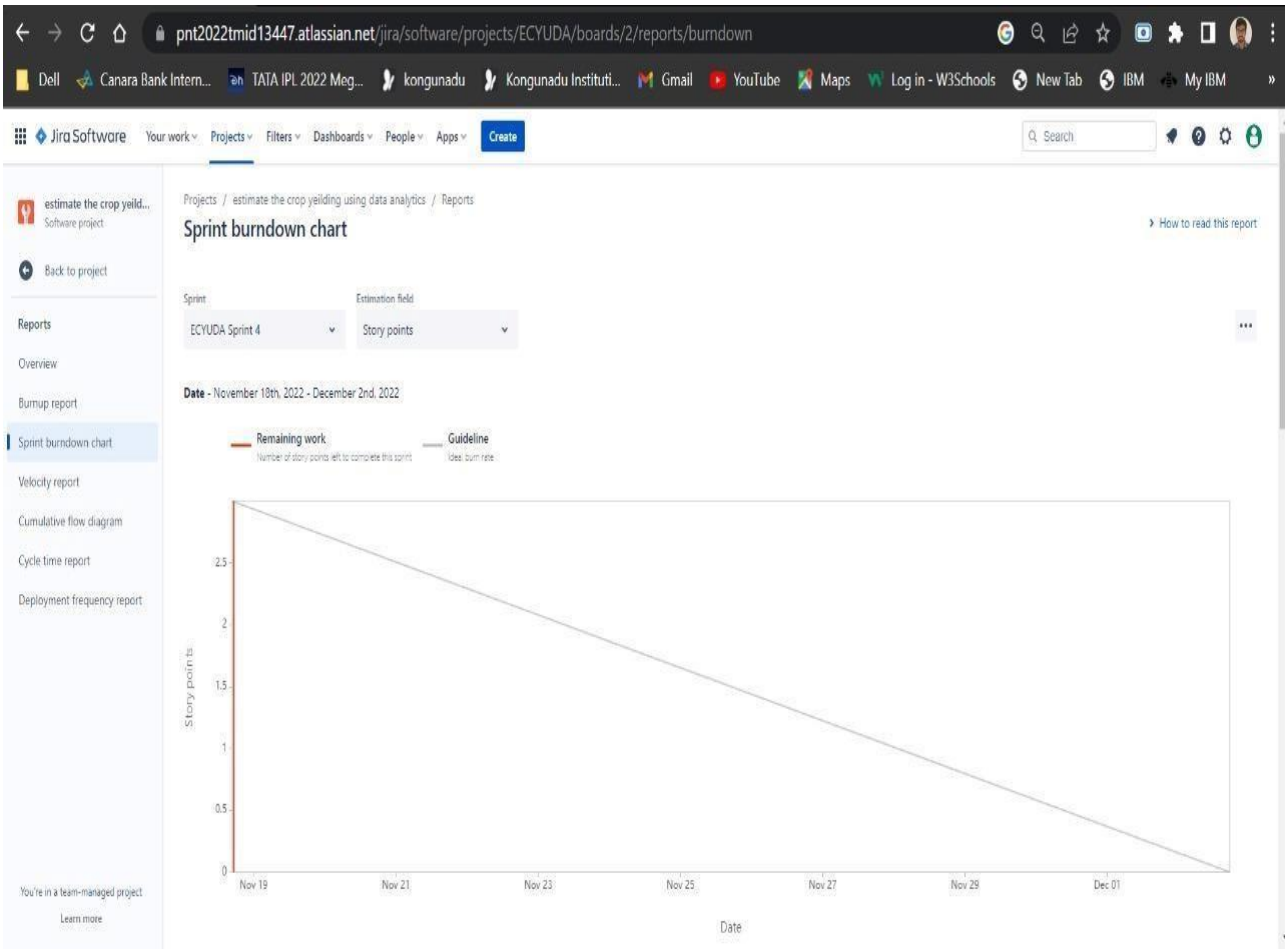


Fig 6.1.3 Burndown chart

CHAPTER 7

CODING & SOLUTIONING

Feature 7.1

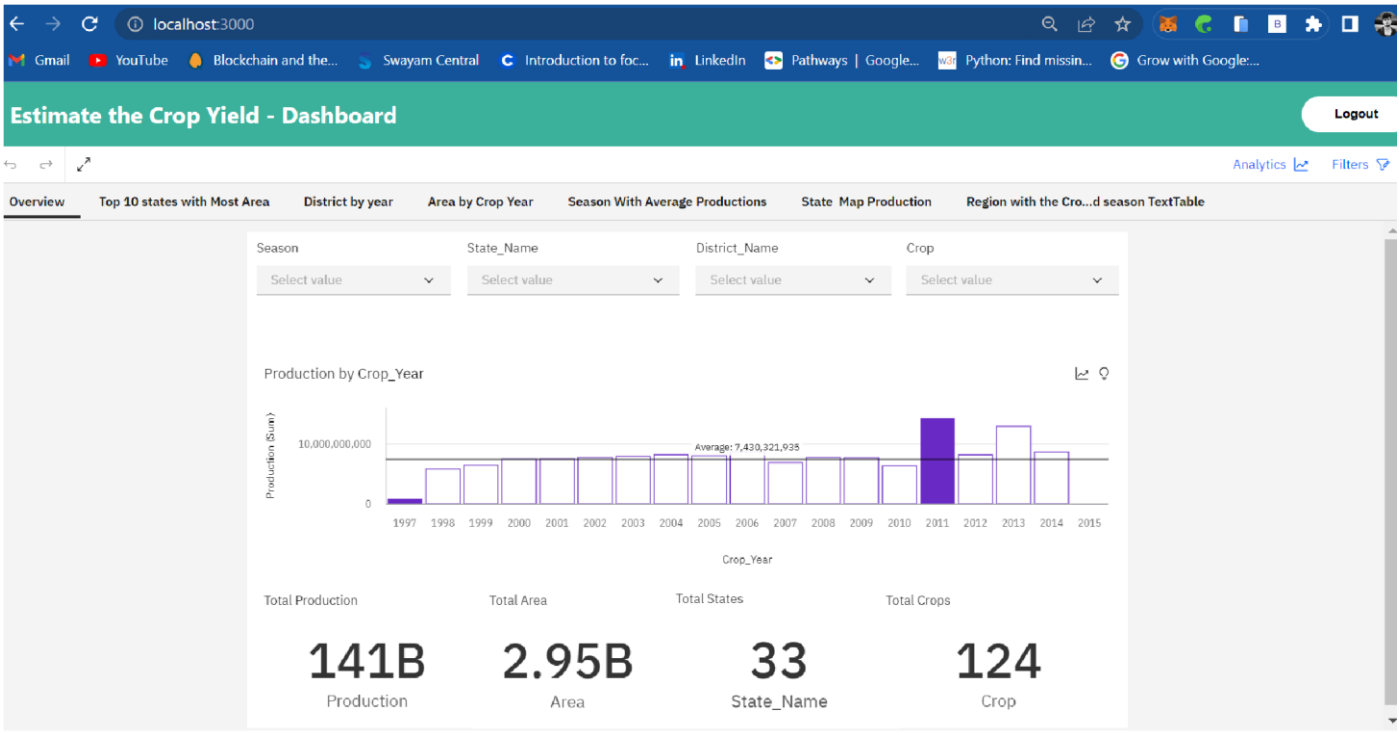


Fig 7.1 Web page image

Feature 7.2

We can display our Dashboard and report on web page by host.

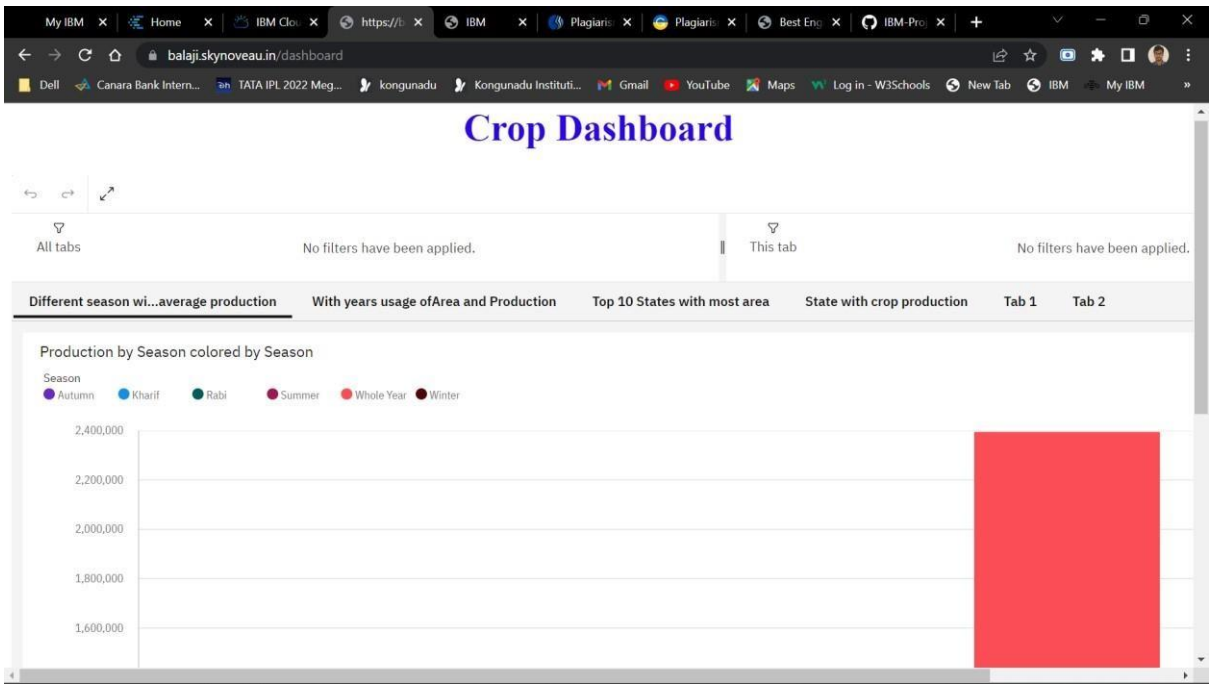


Fig 7.2 Dashboard on web

Database

Upload the dataset to an IBM-provided database (IBM CLOUD). First, you need to create a cloud account. Then connect the cloud to IBM Cognos to retrieve data from Db2 and run charts.

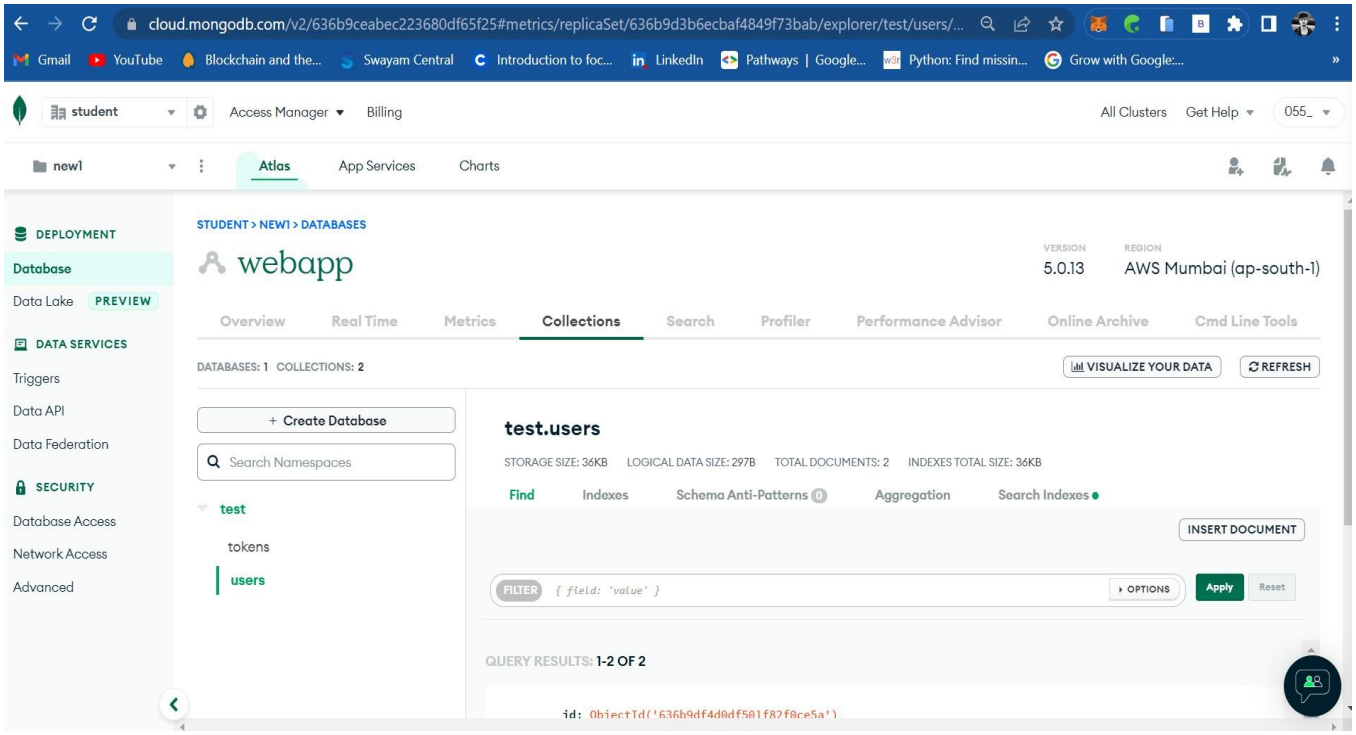


Fig 7.3 Database

CHAPTER 8

TESTING

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	1	2	2	3	8
Duplicate	1	0	3	0	4
External	1	3	0	0	3
Fixed	3	5	5	3	16
Not Reproduced	0	0	0	0	0
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	7	10	8	6	31

Fig 8.1 User Acceptance

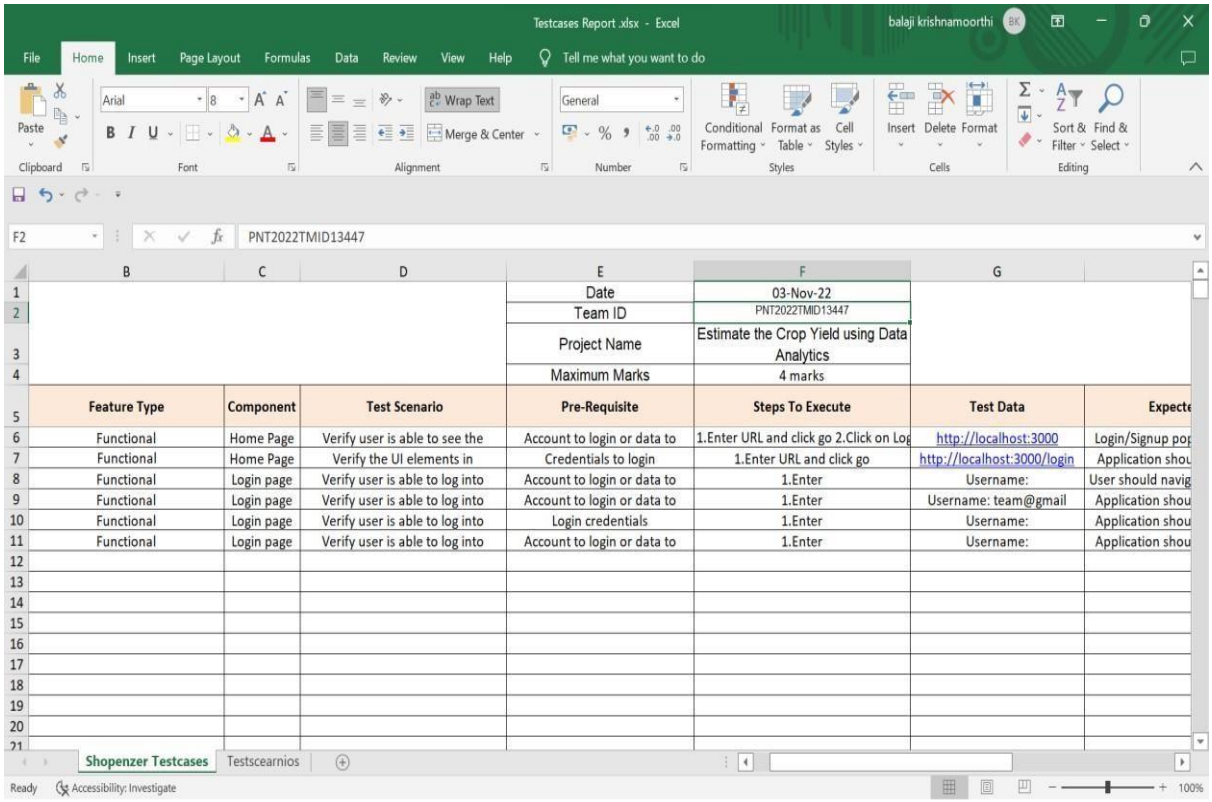


Fig 8.2 Performance Testing

CHAPTER 9

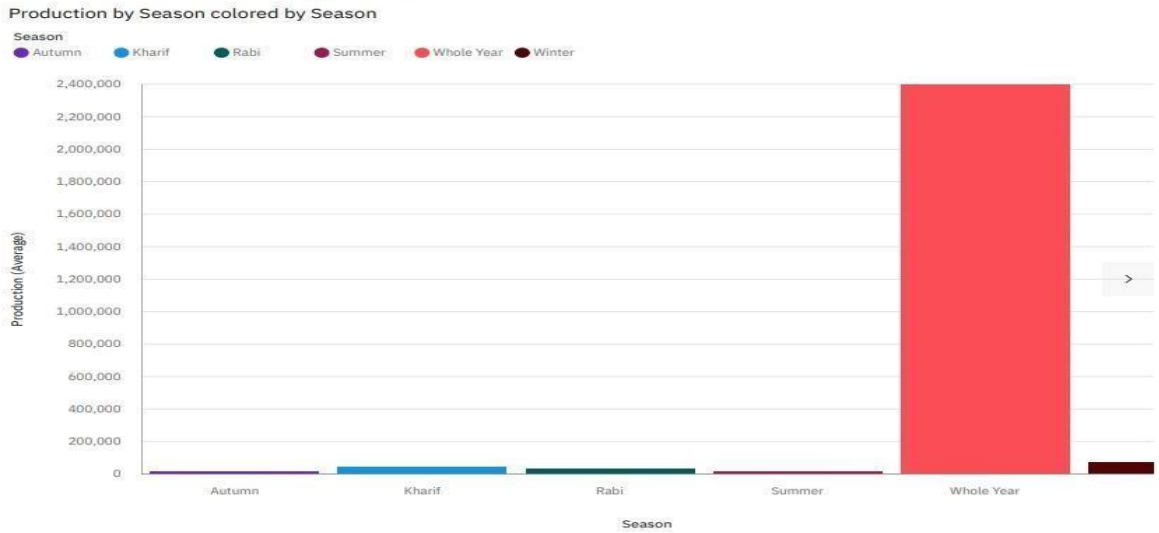
RESULTS

This section discusses the findings of the estimator comparison tests for the 10 state simulation study. Only those simulated data sets for which the algorithm converged within the maximum permitted number of iterations were used for both model-based methods. The sample variance of the estimated county yields used to calculate variance. The tests were run twice on a one-sided basis in each example, pairwise, at the ten percent significant level.

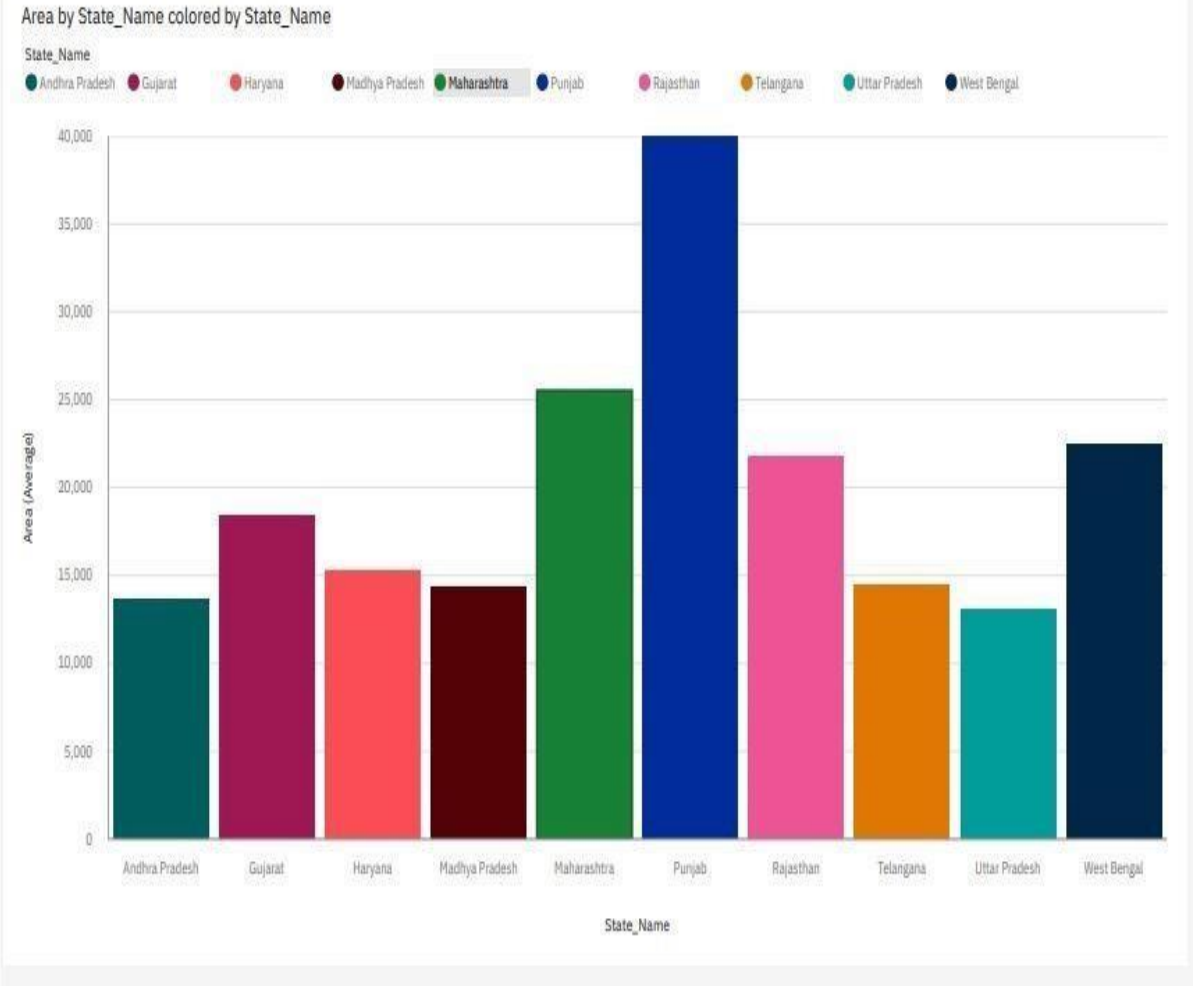
The goal was to determine if the county estimators' bias was generally negative, zero, or positive. The computation of an estimate of root mean square error (RMSE) for each county with at least two positive data for a crop is a useful feature of the programme. This analytic estimator was compared with the square root of the simulation mean square error utilised in the paired comparisons outlined earlier to determine its reasonableness. Strong proof that the method is more effective than the ratio method for a variety of crops cultivated in the lower 48 states can be found in the results presented in this section.

9.1 Performance Metrics:

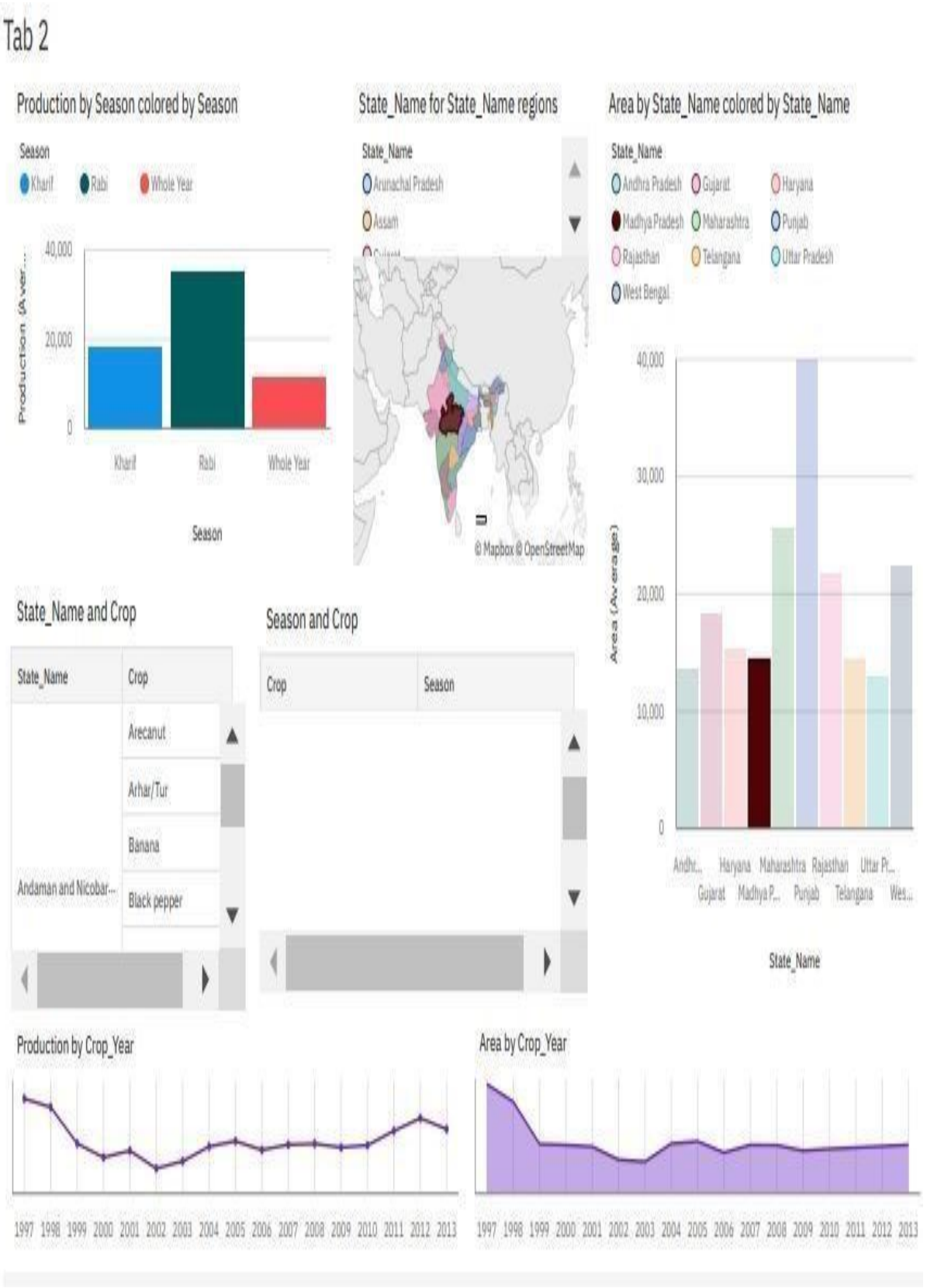
Different season with average production



Top 10 States With most area



With years usage of Area and Production



CHAPTER 10
ADVANTAGE & DISADVANTAGE

Advantage:

Predicting crop productivity under different climatic circumstances can assist farmers and other partners in making fundamental decisions about agronomy and product choice.

This model can be used to choose the best crops for the region and their production, increasing the worth.

The device pinpoints the crop disease and offers a treatment.

By analysing the weather forecast, the device will aid in giving farmers advice on how to prevent crop disease.

As users of this programme, the dataset for that specific region can be stored.

Data that has been saved will enable other farmers to inspect the crop's harvest well in advance of the yield.

The prediction will be even more accurate with additional information.

Disadvantage:

May not be accurate. Design Issue process

Critical Messages can be Skipped

CHAPTER 11

CONCLUSION

The productivity of agriculture has slightly increased as a result of technology's introduction. New ideas like digital agriculture, smart farming, precision agriculture, etc. have been made possible by the innovations. The analysis of agricultural productivity and the uncovering of hidden patterns utilising data sets related to seasons and crop yields have been noted in the literature. Using IBM Cognos, we have observed and conducted analysis regarding various crops grown, area, and productions in various states and districts, some of which are seasons with average output.

Through these data, we learn which seasons see higher average productivity and which see lower production. by crop year, production. We learn from this study which years have high and low production. District production. With the use of these analytics, we may identify the states and districts that are cultivating the chosen crops. Area-based production. This will allow us to estimate the yield and determine how much land needs to be planted. After creating the dashboard, study was done to determine which state, which year, and how much crop area will be produced.

The most important application area is agriculture, especially in emerging nations like India. Using knowledge technology in agriculture will change the way higher cognitive processes operate, and farmers will produce more effectively. This work is done to learn more about the crops that can be used to harvest things in an effective and helpful way. Farmers in Kerala will benefit from accurate crop forecasting across many districts. As a result, the yield rate of crop production is maximised, which benefits our Indian economy.

CHAPTER 12

FUTURE SCOPE

User might try using a data independent system in the upcoming years. No matter the format, our system must function with the same accuracy. Integrating soil information into the system is advantageous since crop selection also considers soil knowledge as a factor. Crop cultivation also requires effective irrigation. Rainfall might indicate whether or not additional water availability is required. By making this study available to all of India, it can be elevated to a higher level..

Finding workable answers to society's complicated issues with environmental and agricultural regulation is

This system will have an intelligence component that will make judgments or take actions based on the current situation.

To reduce the amount of time the farmer interacts with the system, which will require less human resources for monitoring.

Our analysis indicates that a model's accuracy will grow as the number of data points does, hence more data points can be added to the model to improve accuracy. Our system has a messaging module that may be added, allowing enrolled farmers to get a notification of the forecast straight to their registered mobile numbers.

CHAPTER 13

APPENDIX

Source Code: React Web Application (Check for the Github Link)

GitHub link: https://github.com/IBM-EPBL/IBM-Project-42648-1660695765

Project Demo link:

https://youtu.be/ejVp1ByceJk