

PROJECT OVERVIEW:

Agriculture is important for human survival because it serves the basic need. A well-known fact that the majority of population ($\geq 55\%$) in India is into agriculture. Due to variations in climatic conditions, there exist bottlenecks for increasing the crop production in India. It has become a 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.

PURPOSE:

Agriculture forms the basis for food security and hence it is important. In India, majority of the population i.e., above 55% is dependent on agriculture as per the recent information. Agriculture is the field that enables the farmers to grow ideal crops in accordance with the environmental balance. In India, wheat and rice are the major grown crops along with sugarcane, potatoes, oil seeds etc. Farmers also grow non-food items like rubber, cotton, jute etc. More than 70% of the household in the rural area depend on agriculture. This domain provides employment to more than 60% of the total population and has a contribution to GDP also (about 17%) [1]. In the farm output, India ranks second considering the world wide scenario. This is the widest economic sector and has an important role regarding the framework of socio-economic fabric of India. Farming depends on various factors like climate and economic factors like temperature, irrigation, cultivation, soil, rain fall, pesticide and fertilizers

EXISTING SYSTEM:

At present we are at the immense need of another Green revolution to supply the food demand of growing population. With the decrease of available cultivable land globally and the decreased cultivable water resources, it is almost impossible to report higher crop yield. Agricultural based big data analytics is one approach, believed to have a significant role and positive impact on the increase of crop yield by providing the optimum condition for the plant growth and decreasing the yield gaps and the crop damage and wastage. With this aim the present paper reviews about the various advances, design models, software tools and algorithms applied in the prediction assessment and estimation of the crop yield. India is basically agriculture based country and approximately 70% our country economics is directly or indirectly related to the agricultural crops. The principle crop which occupies the highest (60-70%) percentage of cultivable land in the Indian soil is the paddy culture and it is the major crop especially in central and south parts of the India. Rice crop cultivation plays an imperative part in sustenance security of India, contributing over 40% to general yield generation. The enhanced yield of the rice crop depends largely on the water availability and climatic conditions

LITERATURE SURVEY:

REFERENCES

- 1) Rice Crop Yield Prediction using Data Mining Dakshayini Patil, Dr. M. S. Shirdhonkar 2017 Discussed various data mining techniques utilized for prediction of rice crop yield for the state of Maharashtra, India. WEKA tool was applied in dataset processing.
- 2) A Survey on Crop Yield Prediction based on Agricultural Data Dhivya B H, Manjula R, Siva Bharathi S, Madhumathi R/ 2017 Presented a survey on the different algorithms applied in the assessment and prediction of crop yield. Discussed about the mechanism of knowledge discovery in Agricultural data mining.
- 3) A Study on Various Data Mining Techniques for Crop Yield Prediction Yogesh Gandge, Sandhya 2017 Discussed various data mining techniques employed for predicting the crop yield and signifies the importance of accurate data extraction methods of big data analytics.
- 4) Big Data for weed control and crop protection F K Van Evert, S Fountas, D Jakovetic, V Crnojevic, I Travlos & C Kempenaar/ 2017 Outlined Big Data analytics models with numerical algorithms applied. Represent the importance of reforming the mined data in the form of understandable information to the farmers. Discussed about various advances, tools and algorithms applied in transforming the data into easily understandable information to the farmers and thrown a light on success story of Netherlands in achieving the maximum crop yield and their smart farming practices.
- 5) The Impact of Data Analytics in Crop Management based on Weather Conditions Swarupa Rani A/ 2017 Discussed the application of mathematical model like fuzzy logic designs in optimization of the crop yield, artificial neural networks in validation studies, genetic algorithms designs in assessing the fitness of the model applied, decision trees, and support vector machines to study soil, climate conditions and water regimes related to crop growth and pest management in agriculture.

6) A Study on Crop Yield Forecasting Using Classification Techniques R.Sujatha, Dr.P.Isakki Devi/ 2016 Discuss the importance of comparing previous agricultural data with present to identify optimum condition favor enhanced crop yield. Envisaged the importance of best crop selection depending on the season and the climatic factors which supports enhanced crop yield.

7) Prediction of Crop Yield using Regression Analysis Swarupa Rani A/ 2017 Regression analysis was carried out to find the relationship among the parameters i.e Area under Cultivation (AUC), Annual Rainfall (AR) and Food Price Index (FPI) which influences the final crop yield and reported that the crop yield principally depends on the Annual Rainfall (AR).

8) Data requirements for reliable crop yield simulations and yield- gap analysis Patricio Grassinia, Lenny G.J. van Bussel, Hugo de Groote, Martin K. van Ittersum, Kenneth G. Cassman/ 2015 Presented a case study (Nebraska - USA and at a national scale for Argentina and Kenya) on the application of an explicit rationale design approach in identifying the data sources which simulates Crop (maize) yield and also helps in quantifying the maize yield gaps.

9) Prediction of crop yield using big data Wu Fan, Chen Chong, Guo Xiaoling, Yu Hua Wang Juyun/ 2015 Developed a novel model i.e Nearest neighbors modeling to calculate and predict the yield of crop depends on the available Big data sets.

10) The use of satellite data for crop yield gap analysis David B. Lobell/ 2013 Discussed the use of remote sensing technology to identify and measure the causes of yield gaps and to assess the impact on the overall crop yield. Reported very simple methodologies to measure the yield difference with respect to season, environment and the land use.

11) Yield gap analysis with local to global relevance-A review Martin K. van Ittersum, Kenneth G. Cassman, Patricio Grassini, Joost Wolfa, Pablo Tittonell, Zvi Hochman Discussed about the various methods used on quantifying the yield gaps at local-to-global ratio. Reported few standard operation methods, employed to quantify the crop yield potential on the data

collected from the farmers of western Kenya, Nebraska (USA) and Victoria (Australia). Study recommended for the use of accurate and current yield data, with calibrated and validated crop models and up scaling methods in the prediction of crop yield.

12) A tool for analysing vegetable crops data from a greenhouse using data mining techniques. Ponce-Guevara, K. L., Palacios-Echeverria, J. A., Maya-Olalla, E., Dominguez Limaico, (2017). algorithm, which uses a decision tree based on the data entropy is used and results are visualized graphically.

13) Using hybrid support vector regression to predict agricultural output. Jheng, T.-Z., Li, T.-H., Lee, C.-P. (2018). Using hybrid support vector regression to predict agriculture tural output. Hybrid SVR models are used for prediction

14) Estimation of Arecanut Yield in Various Climatic Zones of Karnataka using Data Mining Technique: Manjunatha, M., Parkavi, A. (2018). A Estimation of Arecanut Yield in Various Climatic Zones of Karnataka using Data Mining Technique: A Survey. Classified using fuzzy logic, decision trees, Multiple Linear Regression and Random Forest algorithm to predict the crop yield.

15) Agricultural production output prediction using Supervised Machine Learning techniques. Shakoor, M. T., Rahman, K., Rayta, S. N., Chakrabarty, A. (2017). Agricultural production output prediction using Supervised Machine Learning techniques” Decision Tree Learning-ID3 (Iterative Dichotomiser 3) and K-Nearest Neighbors Regression algorithms are used for prediction.

PROBLEM STATEMENT:

Doing a crop estimate is an important practice because maize is the staple food for our country as well as Africa. Approximately 200 million Africans consume

maize on a daily basis. Knowing how much maize is available in the market will determine how much you and I will need to pay for it at the supermarket. Therefore, crop estimates contribute to the price setting mechanisms of the market.

There are many other products which prices are also indirectly determined by the maize price such as livestock. Knowing how much maize will be available at harvest time will also allow us to manage and budget accordingly. Perhaps in a poor season we will be prompted to hold back on exports and rather keep reserves for our own countries consumption. In a good year we may have the freedom to push exports or perhaps dedicate a larger percentage into animal production. These are all decisions that the crop estimates aid us in making.

Many of these reasons for doing crop estimates are similar for the individual farmer. Farmers will do personal crop estimates in order to budget and plan for the coming season. The tonnes that you expect to harvest have a direct influence on your potential profits. Farmers who run mixed operations where livestock is a part of the business structure will be able to plan and strategise for optimum profits by deciding where the grain will make the most impact. Many farmers sell maize silage and doing a crop estimate will allow them to market their silage according to a dry grain crop estimate. Doing a maize estimate in each field is a good practice as it allows you to assess your performance throughout the planting season. It also assists you in analysing your fertilisation programme.

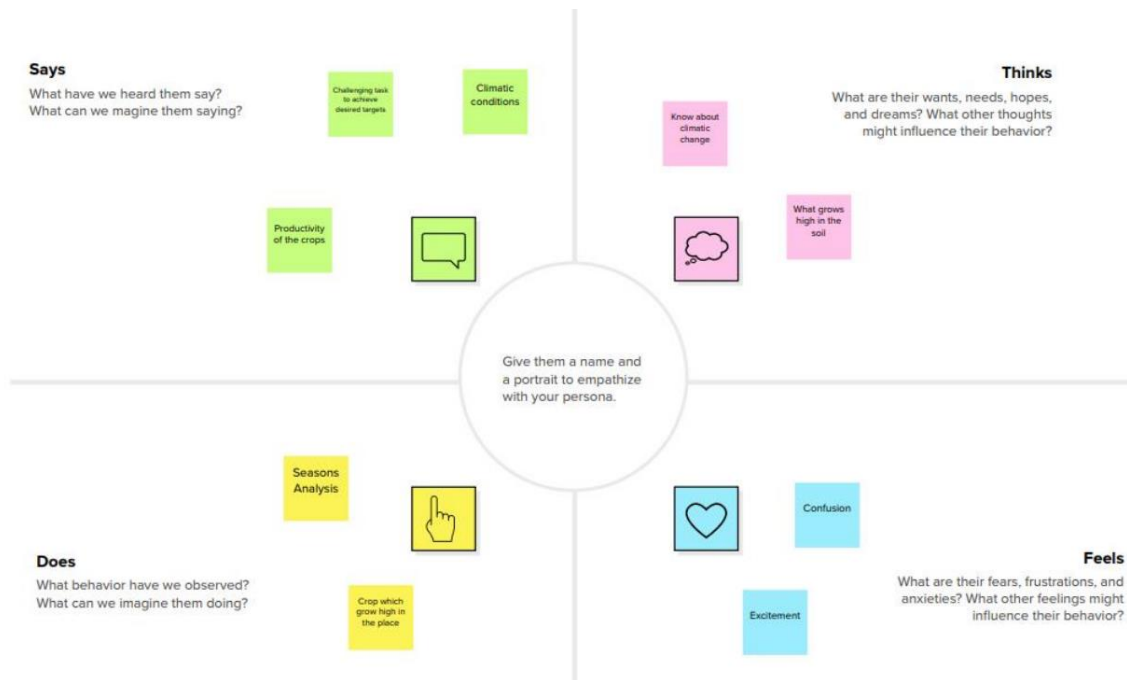
IDEATION AND PROPOSED SOLUTION:

empathy map canvas

An empathy map is **a collaborative tool teams can use to gain a deeper insight into their customers**. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to help teams better

understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges



CUSTOMER JOURNEY MAP:

<div>SCENARIO</div> <div>Estimate the crop yield using data analytics</div>	Awareness	Consideration	Decision	Retention
<div>Motivation</div>	Information about researched data report	Compare the past data	Try to overcome loss	Comparatively gain the past loss
<div>Goals</div>	Data report	More profit for Farmers	Make them work smart	More profit and accurate result
<div>Interaction</div>	Agriculture Camp & Social Media	Camp Website and Advertisement	Direct Information the farmer	Seasonal period Support
<div>Opportunities</div>	Advertisement and Creating camp	Show Advantages	Enhance crop yield and decrease loss	Loyalty date and report & visuals

Brainstorm & Idea Prioritization:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich number of creative solutions. Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room. Step-1: Team Gathering, Collaboration and Select the Problem Statement

Step-1: Team Gathering, Collaboration and Select the Problem Statement

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

🕒 5 minutes

The farmers to know about which crop should be suited for this soil and climate conditions and also know about which gives more profit

00

Step-2: Brainstorm, Idea Listing and Grouping

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

Vivek V		GangaDharan		Sriram P		Sankar Abinеш	
Soil Condition	Analyse which take minimum amount of time	Analyse Crop Demand	Crop Type	Irrigation Type	Crop Growth rate	Types of Soil	Yield Prediction
Climate analysis	Profitable crop	Finding Perfect combination of soil and crop	Quality fertilizer for crops and soil	Profitable Comparison	Crop Maintenance cost	Crop Rotation	Environmental Condition

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

🕒 20 minutes



Step-3: Idea Prioritization



PROPOSED SOLUTION

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The farmers to know about which crop should be suited for this soil and climate conditions and also know about which gives more profit.
2.	Idea / Solution description	The Soil is analysed and give the data which crop is good for this soil and more profitable. Climatic analysis is taken to save the crop from any disaster or cause by any environmental change. Also analyse the more profitable crop in less time.
3.	Novelty / Uniqueness	New features will be extracted from given data by analysing. With these new features, more information can be gained and better decision will be taken to increase profit for farmers.
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none">• Perception of profit about particular crop• Perception of Climatic changes to save from losses• Perception of Fast-growing crops• Perception of Crop production in particular location
5.	Business Model (Revenue Model)	<ul style="list-style-type: none">• Dashboard will be created to view Crop production in required location.• Better decision will be made by farmers.
6.	Scalability of the Solution	This solution can be used by every farmer. This solution can be processed with less memory and quickly. The solution can be used as open source so everyone can use it.

PROBLEM SOLUTION FIT

PROBLEM -SOLUTION FIT
Estimate the crop yield using data analytics.

Define CS, fit into	1. CUSTOMER SEGMENT(S) CS Farmers can be sub segmented. There are three categories namely, micro, small, or marginal; emerging and large; or commercial farmers either based on farm surplus, gross revenue, or land under cultivation.	6. CUSTOMER CC The customer can easily shows the crop production details in cart visualization or any other type of visualization. The customer can know about the state wise production and district wise production, they can also understand the, what type crop would cultivate on particular region. Then farmers can clearly know what type of seeds or crop should planting on the soil.	5. AVAILABLE SOLUTIONS AS Farmers should know the data about crop yield production. It can shows better results to the farmers, customer and company managers. This type of data shows the crop production details with state wise, district wise also. There are many sites to shows the crop yield data at better way.	Explore AS.
	2. JOBS-TO-BE-DONE / PROBLEMS J&P The farmers wants to increase the crop production and they export them all over the world. But their problems are they should not have proper guideless to export the crop and how to cultivate the crop	9. PROBLEM ROOT CAUSE RC The customer do not have proper transport facilities. They search so many crop but they wouldn't got wanted crop list details. They couldn't have correct location. The farmers shouldn't have a proper level of water, soil wealth is unhealthy they couldn't maintain the crop at correct way.	7. BEHAVIOUR BE If the customers wants to search some particular crop details on the data it can shows if the details are matches to any one of the particular data set it can shows the correct results to the users. It behaves user friendly.	
Focus on J&P, tap into BE, understand	3. TRIGGERS The cultivation crop are sales at market in better cash, they are again and again will interested to cultivate the crop TR	10. YOUR SOLUTION SL Both of them customer and farmers to know about the crop yield details in given dataset. It can shows the clear visualization and they can get some ideas about crop production. The given dataset can shows the year production in India by each state it will useful to both. It will update data at up to date. There many sites provides many details about crop yield.	8. CHANNELS of BEHAVIOUR CH We get different type of pathway. If the customers know the apples details they can know all about the apples. It can shows best results path on the particular region. If the famer want to cultivate some crop on their own land they must know about the soil type and then water level etc., then they will to cultivate they crop.	Focus on J&P, tap into BE, understand
	4. EMOTIONS: BEFORE / AFTER EM The production will increase they are happy. The customer are most interested to buy the crop at cheapest rate at any market.			
Identify strong TR & EM				Extract online & offline CH of BE

FUNCTIONAL REQUIREMENTS:

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Account creation	Create an account in the dashboard
FR-4	Input credentials	Uploading the dataset and analysing the dashboard
FR-5	Processing Methods	Using IBM Cognos Analytics Dashboard using Prediction algorithm to find them
FR-6	Output Credentials	Using the dashboard and algorithm they know about the crop yield estimate

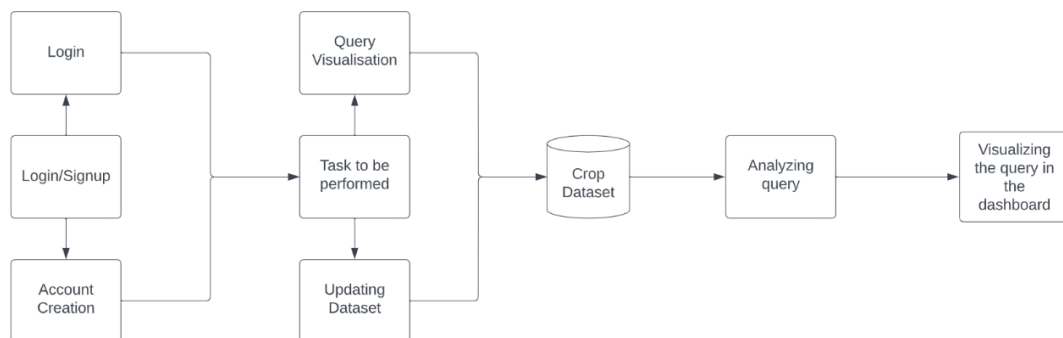
Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The user can be able to access with the system user friendly. The system is built with a simple manner and algorithm.
NFR-2	Security	Access permission for the particular system information it can only change by the system admin. The user must be having a high security measures.
NFR-3	Reliability	The database update process must roll back all the related update when any update fails. The dataset will not be modified by anyone only the admin can modify the dataset.
NFR-4	Performance	The performance of the dashboard is very easy and flexible to the user. It can be perform smooth.
NFR-5	Availability	New module deployment must not impact front page, dashboard and check out the pages availability and then show some visualization of them.
NFR-6	Scalability	It can be support many users to access at a time. The dashboard is scalable for the crop when their farmers and customers is used to analysis.

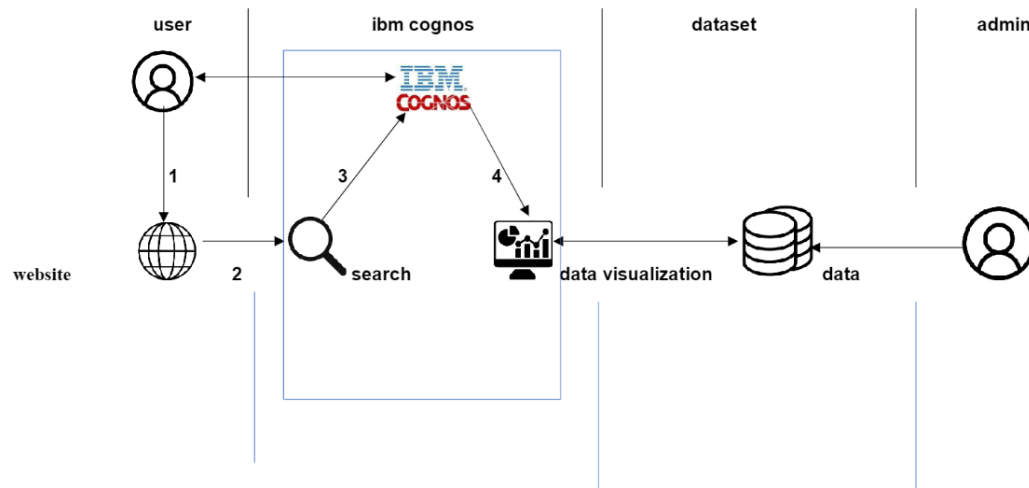
PROJECT DESIGN

DATA FLOW DIAGRAM



ARCHITECTURE DIAGRAM

Technical Architecture:



6.PROJECT PLANNING & SCHEDULING

TITLE	DESCRIPTION	DATE
Literature Survey & Information Gathering	Literature survey on the selected project & gathering information by referring to technical papers, research publications etc.	29 Aug-3 Sept
Prepare Empathy Map	Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements	5 Sept- 10 Sept
Ideation	List them by organizing the brainstorming session and prioritize the top 3 ideas based on feasibility & importance.	12 Sept -17 Sept
Proposed Solution	Prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	19 Sept -24 Sept
Problem Solution Fit	Prepare problem - solution fit document.	26 Sept – 1 Oct
Solution Architecture	Prepare a solution architecture document.	26 Sept – 1 Oct

UNDERSTANDING THE DATASETS:

Understanding The Dataset This project is based on a understanding the crop production of India .

Download the dataset from the below link. It has 2,46,092 data points (rows) and 6 features(columns) describing each crop production related details.

Dataset Link :Dataset Let's understand the data we're working with and give a brief overview of what each feature represents or should represent

1. State Name - All the Indian State names.
2. District Name -Different District names.
3. Crop Year- contains the crop years.
4. Season – Different seasons for crop production
5. Area- Total number of areas covered. 6. Production- production of crops.

crop_production - Excel

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

Clipboard

Font

Alignment

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Styles

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POSSIBLE DATA LOSS Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format. Don't show again Save As

State_Name

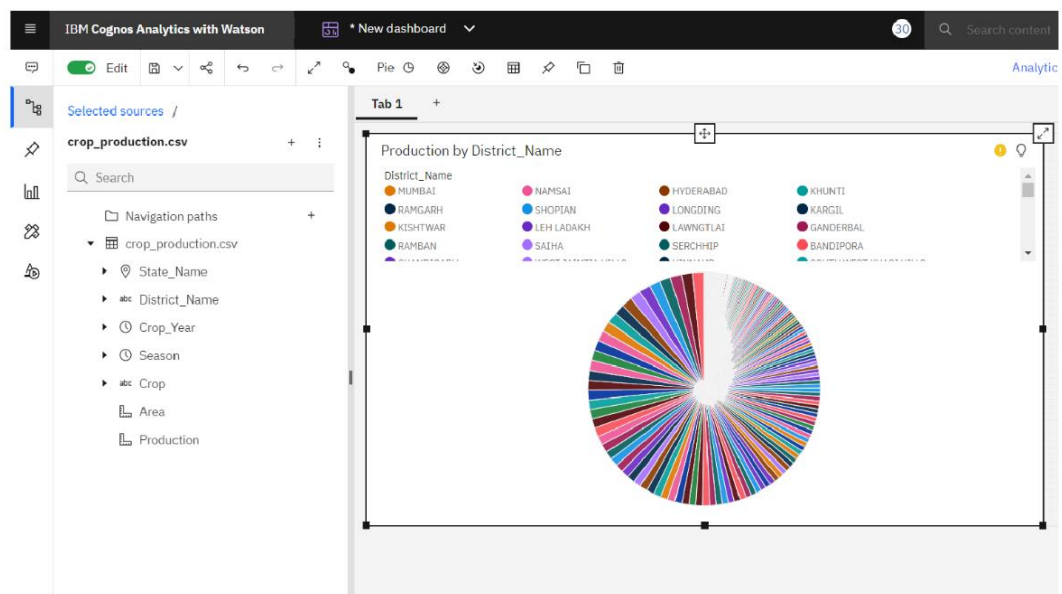
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	State_Name	District_Name	Crop_Year	Season	Crop	Area	Production										
2	Andaman + NIOBARS	2000	Kharif	Areca nut	1254	2000											
3	Andaman + NIOBARS	2000	Kharif	Other Kharif	2	1											
4	Andaman + NIOBARS	2000	Kharif	Rice	102	321											
5	Andaman + NIOBARS	2000	Whole Year	Banana	176	641											
6	Andaman + NIOBARS	2000	Whole Year	Cashew nut	720	165											
7	Andaman + NIOBARS	2000	Whole Year	Coconut	18168	65100000											
8	Andaman + NIOBARS	2000	Whole Year	Dry ginger	36	100											
9	Andaman + NIOBARS	2000	Whole Year	Sugarcane	1	2											
10	Andaman + NIOBARS	2000	Whole Year	Sweet potato	5	15											
11	Andaman + NIOBARS	2000	Whole Year	Tapiooca	40	169											
12	Andaman + NIOBARS	2001	Kharif	Areca nut	1254	2061											
13	Andaman + NIOBARS	2001	Kharif	Other Kharif	2	1											
14	Andaman + NIOBARS	2001	Kharif	Rice	83	300											
15	Andaman + NIOBARS	2001	Whole Year	Cashew nut	719	192											
16	Andaman + NIOBARS	2001	Whole Year	Coconut	18190	64430000											
17	Andaman + NIOBARS	2001	Whole Year	Dry ginger	46	100											
18	Andaman + NIOBARS	2001	Whole Year	Sugarcane	1	1											
19	Andaman + NIOBARS	2001	Whole Year	Sweet potato	11	33											
20	Andaman + NIOBARS	2002	Kharif	Rice	189.2	510.84											
21	Andaman + NIOBARS	2002	Whole Year	Areca nut	1258	2083											
22	Andaman + NIOBARS	2002	Whole Year	Banana	213	1278											
23	Andaman + NIOBARS	2002	Whole Year	Black pepper	63	13.5											
24	Andaman + NIOBARS	2002	Whole Year	Cashew nut	719	208											
25	Andaman + NIOBARS	2002	Whole Year	Coconut	18240	67490000											
26	Andaman + NIOBARS	2002	Whole Year	Dry chillies	413	28.8											
27	Andaman + NIOBARS	2002	Whole Year	Dry ginger	47.3	133											
28	Andaman + NIOBARS	2002	Whole Year	Sugarcane	5	40											

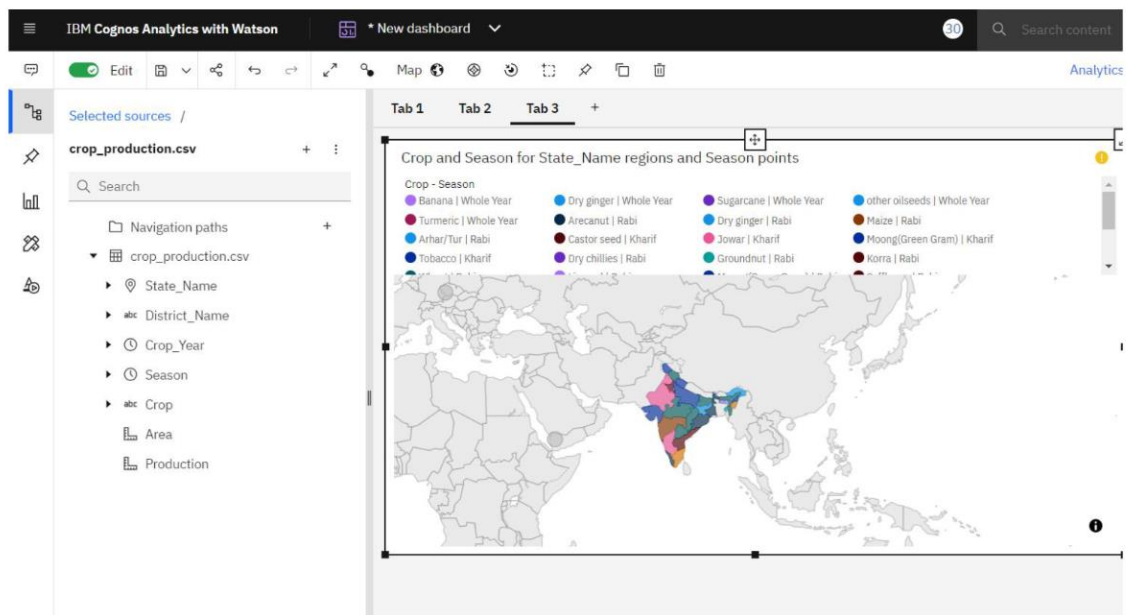
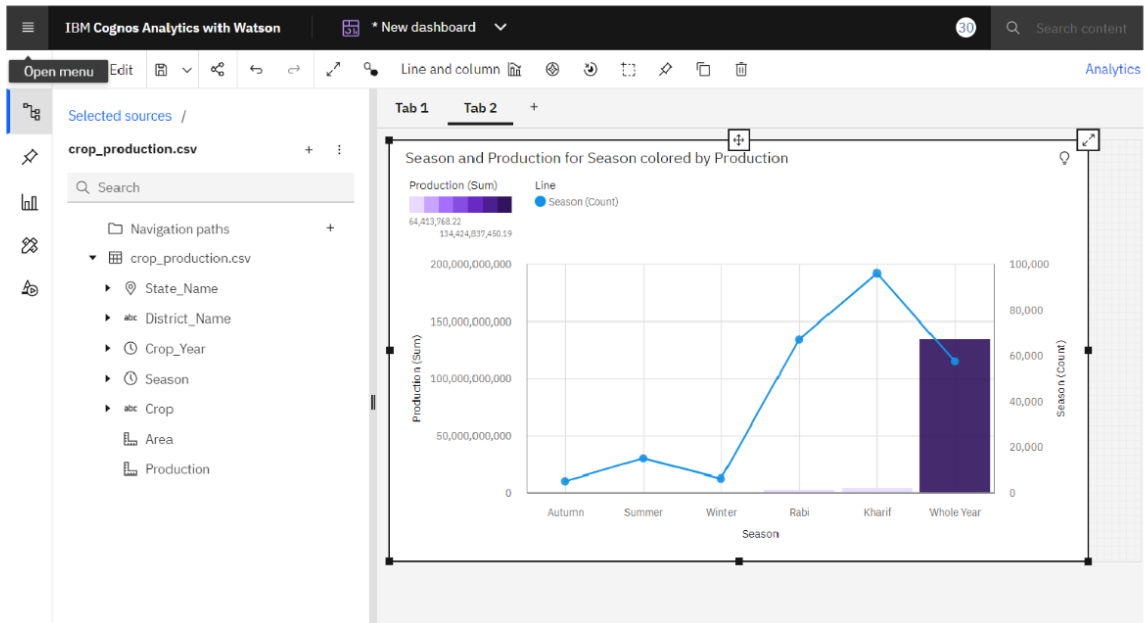
crop_production

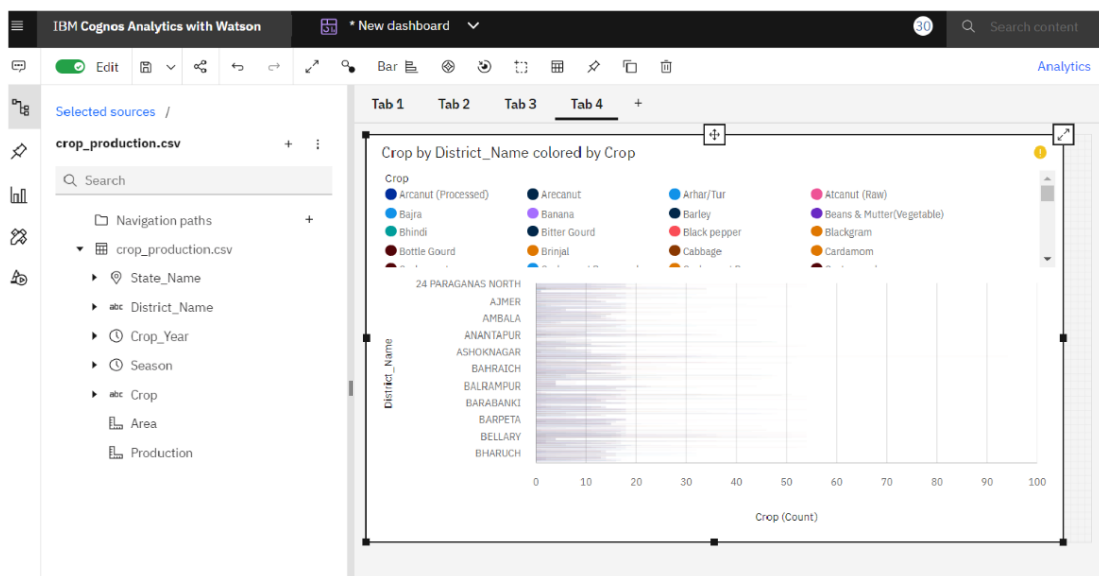
Ready Accessibility: Unavailable

IBM Cognos Analytics with Watson							
* New data module							
Data module							
Grid							
Row Id	State_Name	District_Name	Crop_Year	Season	Crop	Area	
1	Andaman and Nicobar Islands	NICOBARS	2000	Kharif	Areca nut	1254	
2	Andaman and Nicobar Islands	NICOBARS	2000	Kharif	Other Kharif pulses	2	
3	Andaman and Nicobar Islands	NICOBARS	2000	Kharif	Rice	102	
4	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Banana	176	
5	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Cashew nut	720	
6	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Coconut	18168	
7	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Dry ginger	36	
8	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Sugarcane	1	
9	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Sweet potato	5	
10	Andaman and Nicobar Islands	NICOBARS	2000	Whole Year	Tapioca	40	
11	Andaman and Nicobar Islands	NICOBARS	2001	Kharif	Areca nut	1254	
12	Andaman and Nicobar Islands	NICOBARS	2001	Kharif	Other Kharif pulses	2	
13	Andaman and Nicobar Islands	NICOBARS	2001	Kharif	Rice	83	

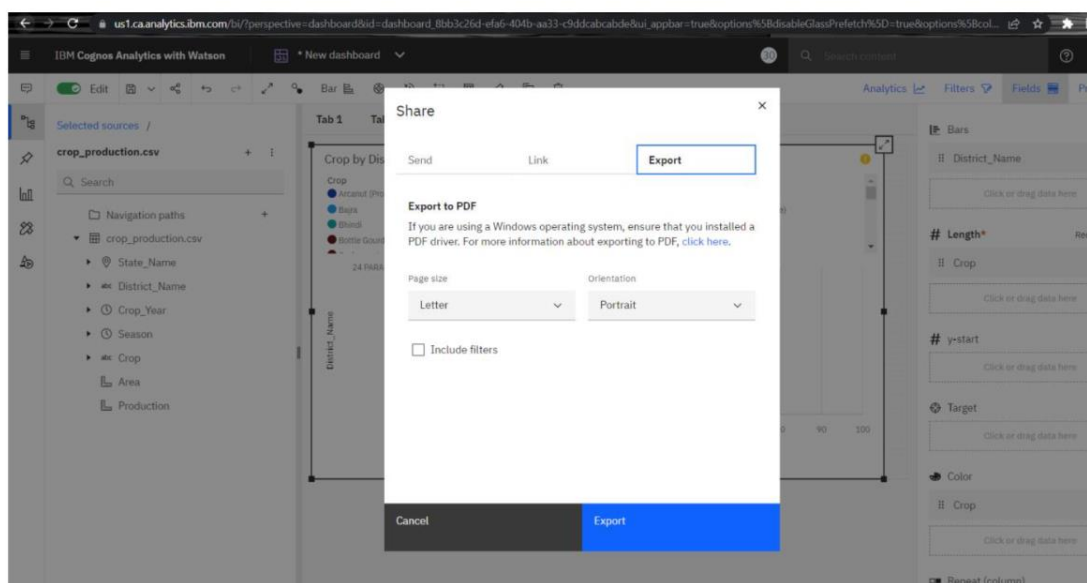
Data Exploration:





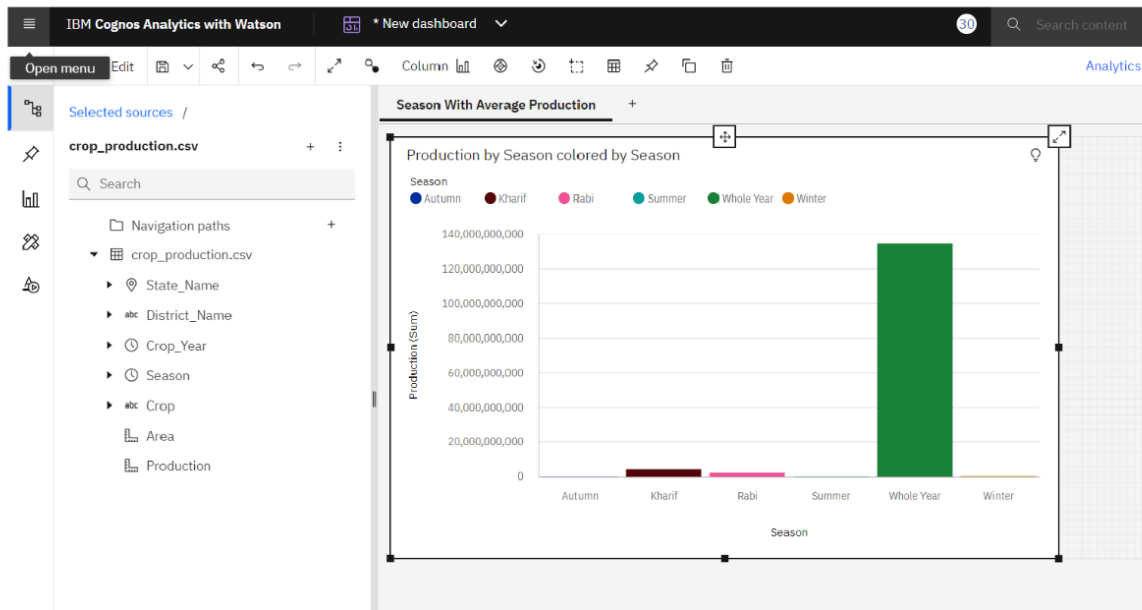


Export Dataset:

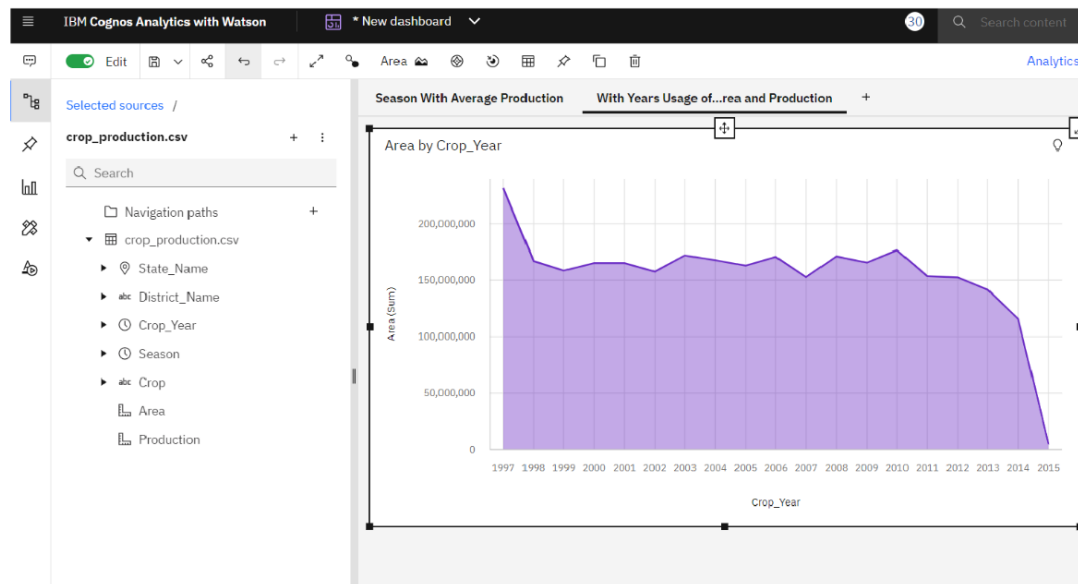


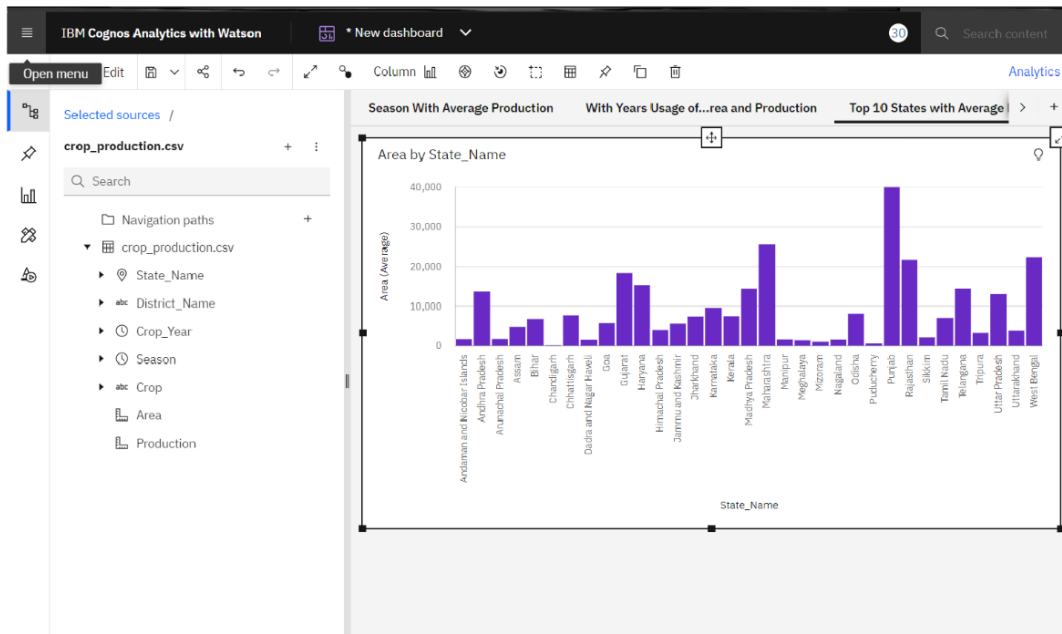
Dashboard Creation and Data Visualization

Season with Average Production:

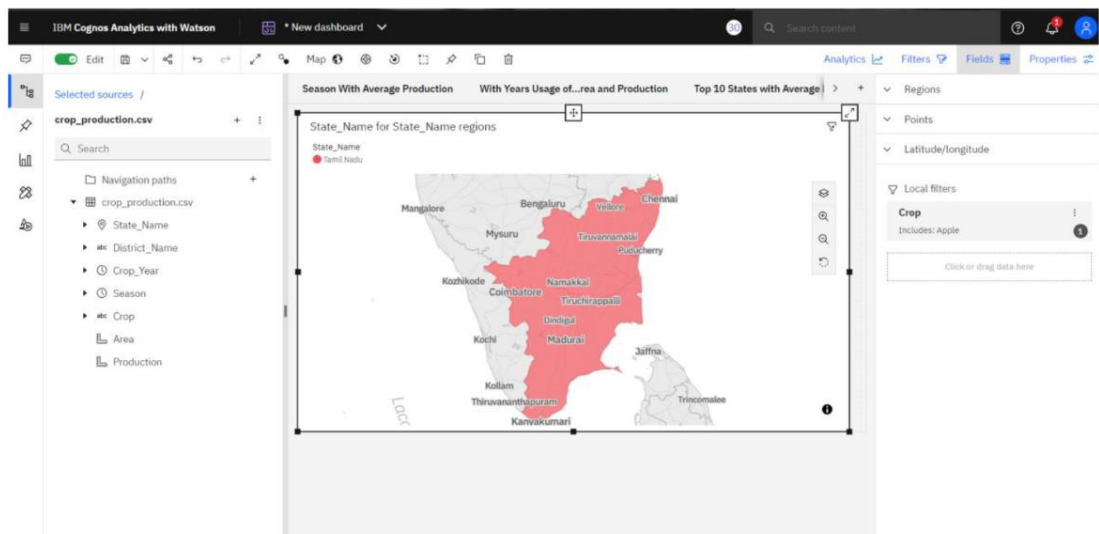


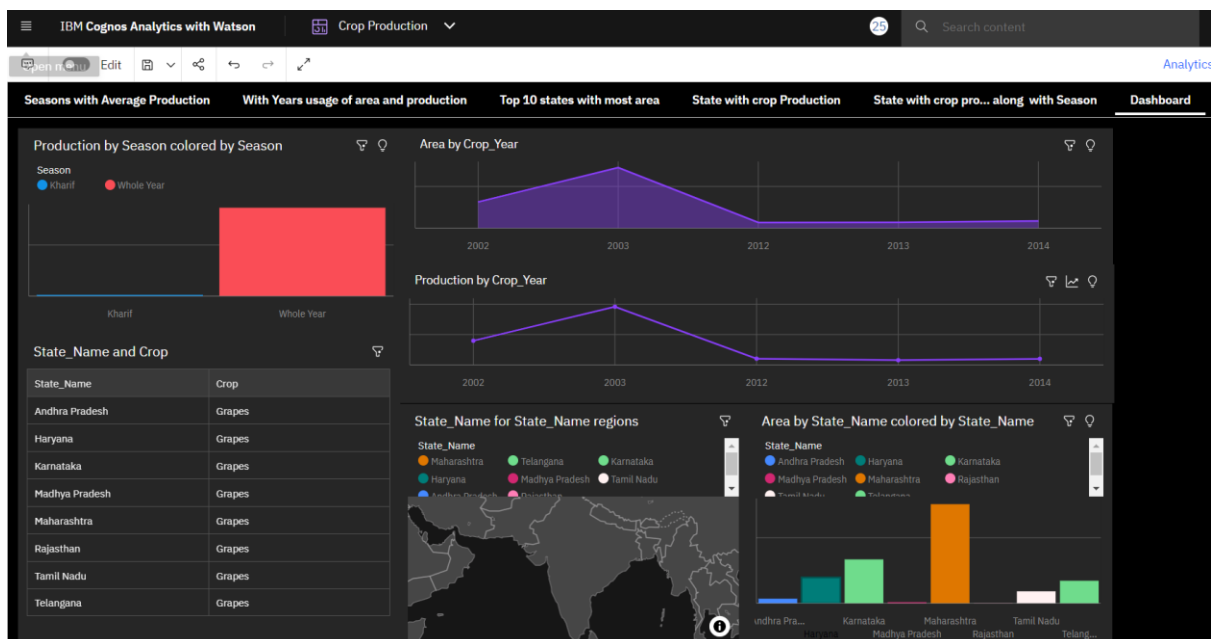
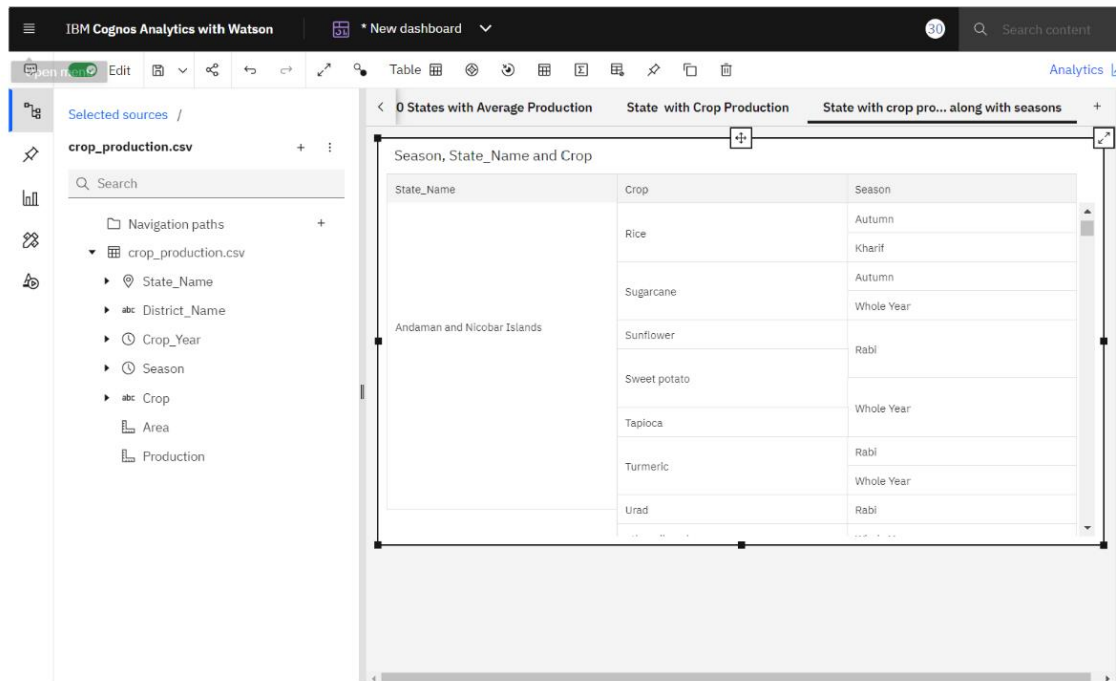
With Years Usage of Area and Production:





State with Crop Production:





Advantages of crop yield prediction

Crop yield prediction is also used by farmers to make decisions about when to plant and harvest crops based on soil moisture content, pest infestations, and other factors such as weather conditions and fertilizer requirements.

The quantity and quality of crops produced in the world is a major factor affecting food security.

This is especially important in developing countries where agriculture is still an important part of the economy. To predict crop yield, we need to understand how much sunlight plants receive and how much water they need.

Plant growth depends on these two factors, but many other factors affect plant growth such as temperature, humidity, and [soil type](#).

Yield data can also be used to monitor progress toward global goals set by governments, non-governmental organizations, and other stakeholders.

In addition, yield data is used to identify strengths and weaknesses in farming practices and make recommendations based on this information.

Disadvantages:

Although these crops are known for their high yielding property, the high yield crops also have some disadvantages:

- The high yield crops require more water and fertilizers as compared to the normal varieties of crops.
- They require frequent weeding.
- Continuous use of pesticides.
- The high yield crops, when compared with the traditional varieties are generally more susceptible to diseases.

CONCLUSION

As a result of penetration of technology into agriculture field, there is a marginal improvement in the productivity. The innovations have led to new concepts like digital agriculture, smart farming, precision agriculture etc. In the literature, it has been observed that analysis has been done on agriculture soils, hidden patterns discovery using data set related to climatic conditions and crop yields data. The activities of agriculture field are numerous like weather forecasting, soil quality assessment, seeds selection, crop yield prediction etc. In this

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survey, the specific activity, crop yield prediction has been surveyed and the major trends have been identified. The rice crop yield prediction has been done in the state of Maharashtra using data mining techniques in one of the works [8]. The analysis has been done using machine learning framework WEKA. In the work carried out in [9], various algorithms applied in the assessment crop yield and mechanism for knowledge discovery has been discussed. The challenges and opportunities in the field of Big Data analytics in agriculture has been discussed in [6] with a case study of Netherlands. Fuzzy logic designs have been used in optimizing the crop yields and the same has been explained in the research work in [5]. A case study of Nebraska - USA and at a national scale for Argentina and Kenya has been done and presented in [14]. The remote sensing technology for identification and measurement of the causes of yield gaps and their impact on final crop yield is presented in [15]. 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.

Future scope:

1. Predict appropriate crop and maximum yield in the climate change.
2. Create an android app.
3. Collection of data, Analysis of it and modification of the algorithm.
4. IOT application in agriculture, automation in production line and man free agriculture
which is the future of the world ,this is the first step of it.
5. Find the percentage yield to happen from the match given percentage in terms of % error

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