

## Ideation Phase Literature Survey

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| Date          | 30 September 2022                            |
| Team ID       | PNT2022TMID03011                             |
| Project Name  | Estimate the Crop Yield using Data Analytics |
| Maximum Marks | 4 Marks                                      |

### LITERATURE SURVEY:

| S NO | TOPIC  | PROPOSED SYSTEM   | CONCLUSION   |
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| 01   | M. A. JAYARAM AND NETRA MARAD, "FUZZY INFERENCE SYSTEM FOR CROP PREDICTION", JOURNAL OF INTELLIGENT SYSTEMS, 2012. | <p>The proposed system suggests an attempt to <b>develop fuzzy inference systems for crop yield prediction</b>. Physio morphological features of Sorghum were considered. A huge database (around 1000 records) of physio morphological features such as days of 50 percent showering, 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 and 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 <b>panicle length contributes forth yield as the lone parameter with almost one-to-one matching between predicted yield</b> 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 rejected by very low RMS value.</p> | In hybrid plants, the morphological features such as plant height, panicle length, panicle weight, number of primaries and length of the leaves cannot be determined or predicted accurately. Therefore, sometimes this becomes a failure model. |
| 02   | P. VINDHYA "CROP YIELD PREDICTION USING BIG DATA ANALYTICS" ANNA   | The proposed system suggests the accurate prediction of crop yield certainly benefits the farmers in choosing the right method to reduce the crop damage and get best prices for their crops. The factors involved in this  | The critical challenge remaining with these methods is scaling up of these approaches to   |

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|    | <p>UNIVERSITY,<br/>TRICHY, TAMIL<br/>NADU, INDIA, 5<br/>MAY 2015.</p> | <p>method are <b>Area under Cultivation (AUC)</b> interims of<br/>hectars, <b>Annual Rainfall (AR)</b> rates and <b>Food Price<br/>Index (FPI)</b> and to develop relationships among these<br/>parameters. <b>Regression Analysis (RA) methodology<br/>was applied to examine the selected factors and their<br/>impact on crop prediction and final yield.</b> RA<br/>methodology is a multivariable investigation practice<br/>which can categorize the factors into groups such as<br/>explanatory and response variables and helps to<br/>assess their interaction to obtain a resolution. Crop<br/>yield gaps, measured as difference between expected<br/>yields based on the potency and actual farm yield<br/>received. In order to achieve the higher crop yield,<br/>farmers must tackle the influencing factors such as<br/>influence of change in climate conditions on the<br/>prospects of crop yields, and change in the usage of<br/>agricultural land to assess and ultimately reduce the<br/>crop yield gaps. Several researchers reported the<br/>applications of bio simulation models to estimate the<br/>crop yield gaps in the last decade.</p> | <p>assess the data collated<br/>between different time<br/>intervals from the<br/>broader geographical<br/>regions.</p>  |
| 03 | <p>A. D. BOSE, “BIG<br/>DATA ANALYTICS IN<br/>AGRICULTURE”</p>        | <p>The proposed system suggests how Big Data Analytics<br/>combined with various structured and unstructured<br/>data helps in <b>providing insight to farmers to make a<br/>decision as to which crops to grow and reduce losses<br/>due to unexpected or unpredictable disasters.</b> In<br/>Section I the paper states that we can collect the data<br/>produced by sensors from the official databases that<br/>are usually maintained and governed by institutions.<br/>Here the author suggests we can collect and analyze<br/>the data in different stages in agriculture and see their<br/>influence in the big picture. It is dependent on two</p>   | <p>The author states that<br/>obstacles faced for<br/>agriculture are usually<br/>Technical or<br/>Organizational<br/>problems. The paper<br/>further mentions the<br/>problems faced in the<br/>big data analysis of<br/>agriculture data,<br/>majorly, availability,</p> |

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|    |   | <p>major factors, the push and pull factor. Visualization of agricultural data is done to simplify the complex, structured, and unstructured data. Interpretation of data can be done using methods like overviews, verifiable models, or in an Ad-Hoc manner graphs. the implementation of analytic techniques in agriculture had been discussed. The first method is an <b>Intelligent crop recommendation system</b> that considers all the factors such as <b>soil conditions, temperature, rainfall and location</b>. This system is further split into two different systems: the crop predictor, whose main task is to help agriculturists by recommending crops and the rainfall prediction system that predicts the occurrence of rainfall for each month across the year. The next method discussed was Precision Agriculture using Map-Reduce used to allow variable rates and inputs which help in the understanding of time and space variability in criterion. Here the data is obtained and pre-processed. Then map-reduce is performed, and 3D visualization is done to visualize the output. Further crop prediction using various machine learning approaches were discussed. A few of them were <b>1) Grey wolf optimization (GWO) technique 2) K-means clustering 3) Apriori algorithm 4) Naive Baye</b>.</p> | <p>accessibility and scalability of data for analysis.</p>  |
| 04 | <p><b>B. R. PRIYA, D. RAMESH, E. KHOSLA, “CROP PREDICTION ON THE REGION BELTS OF INDIA: A NAÏVE BAYES</b></p> | <p>The proposed system focuses on the system of agriculture in Telangana. The data is collected from Cridas and farms of Hyderabad and Hayathnagar. A recommendation system recommends which crop to cultivate in the related seasons using Naïve Bayes classifier. Rice, Cotton, Maise and Chillies are the crops taken into consideration. The author tells the</p>   | <p>This work used Naïve Bayes to introduce a crop recommender system to make it very efficient when it comes to computation. The system can be used</p> |

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|    | <b>MapReduce<br/>PRECISION<br/>AGRICULTURAL<br/>MODEL” .</b>   | <p>advantages and the gray areas of methods and models used in previous work like <b>linear regression with neural networks, MapReduce, KNN algorithm, a crop growth prediction model, sequential data assimilation</b>. In Section III, the author describes the proposed methodology which is used to predict which of the four crops are suitable in Telangana. He talks about the modality and methodological conditions of 3 zones, i.e. <b>(i) Northern Telangana, (ii) Central Telangana and (iii) inb Southern Telangana</b>, with seven major types of soil in which farmers mainly cultivate soybean, maise, rice, cotton where the water for irrigating the soil is provided by the rivers the Godavari and Krishna and monsoons (June-September).Then feature <b>selection and data extraction were performed in terms of soil, temperature, rainfall and atmospheric pressure</b>. Further MapReduce was implemented on this data, and then a Naive Bayes classifier model for crop prediction was made using the Naive Bayes algorithm. This model recommended two or more crops based on the input data supplied.</p> | on a variety of crops as it is scalable.  |
| 05 | <b>D. M. G. RAMYA, C. BALAJI, L. GIRISH, (2015).<br/>“ENVIRONMENT<br/>CHANGE<br/>PREDICTION TO<br/>ADAPT<br/>CLIMATE-SMART<br/>AGRICULTURE</b> | <p>The main aim of the proposed system is to predict changes in weather and help farmers in making agriculture-related decisions based on those changes.</p> <p>The paper has proposed a model to find solutions to modern world problems, such as worldwide food insecurity induced by frequent climate change, to predicting the impact of extreme weather events and mitigating its effect on global finance. They have made use of Big Data Analytics techniques to make an</p>  | The authors of the paper aim to improve their model such that it can be used for providing alerts in natural hazards in the future. |

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|    | <b>USING BIG DATA ANALYTICS”</b>  | <p>automatic prediction system. This paper builds the model based on the Hadoop framework.HDFS stores datasets and provides backup features. They focused on three factors while collecting data, namely, precipitation, temperature and cloud cover for the state of Karnataka. The authors have mainly used Hive for reading and processing data. Hive’s strong SQL skills make it possible to process huge volumes of data stored in HDFS. Hive converts SQL queries into a series of MapReduce jobs. They have used MapReduce to analyze the data and as an execution engine suitable for large data processing and to improve the response speed for returning query results.</p>   |  |
| 06 | <p>E. A. K. KUSHWAHA, S. BHATTACHARYA, “CROP YIELD PREDICTION USING AGRO ALGORITHM IN HADOOP”</p> | <p>The proposed system aims to <b>predict the crop yield and suggest crops based on it which would, in turn, increase the profit of the farmers and overall, the entire agriculture sector.</b> It also focuses on <b>improving the quality of the crops using datasets for diseases.</b> They have used a new algorithm called <b>Agro Algorithm</b> to predict the crop yield and suggest crops based on the crop yield and taking the soil type into consideration.In section I of the paper, the authors have used weather datasets containing information about <b>temperature, rainfall in mm, wind speed, evaporation, humidity etc.</b> They further used the weather datasets to determine the type of soil. They also used datasets for crop diseases to determine the ideal weather conditions which would be suitable for a particular crop to grow.The paper talks about some basic knowledge that <b>is required to improve the quality of crops,such as selection of plant and soil</b></p> | <p>The crop yield is improved by using <b>weather, soil, crop and disease datasets.</b> This in turn, boosts the standard of production of crops. It helps farmers immensely in selecting a crop suitable for the weather and soil type. <b>In the future, the authors aim to classify all the types of diseases for a particular crop and determine its cause which would further improve the quality of crops.</b></p> |

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|  |  | <p><b>factors such as pH</b>, which would play an important role in getting a good yield. The properties of the soil should also be known beforehand. It is also important to select the right seeds and estimate the right amount of fertilizer and pesticides required.</p> |  |
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