Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	PNT2022TMID51723
Project Name	Estimate the crop yield using data analytics
Maximum Marks	4 Marks

Technical Architecture:

A architecture is applied to classify several leaf diseases of plants and fruits. Food security has become a real challenge for some organizations in charge of the food program and for the majority of countries, especially African countries. Improving food security could also pass through the handling of agricultural field. We initially collected crop production and climate data from different source and we merged them into a centralized database.
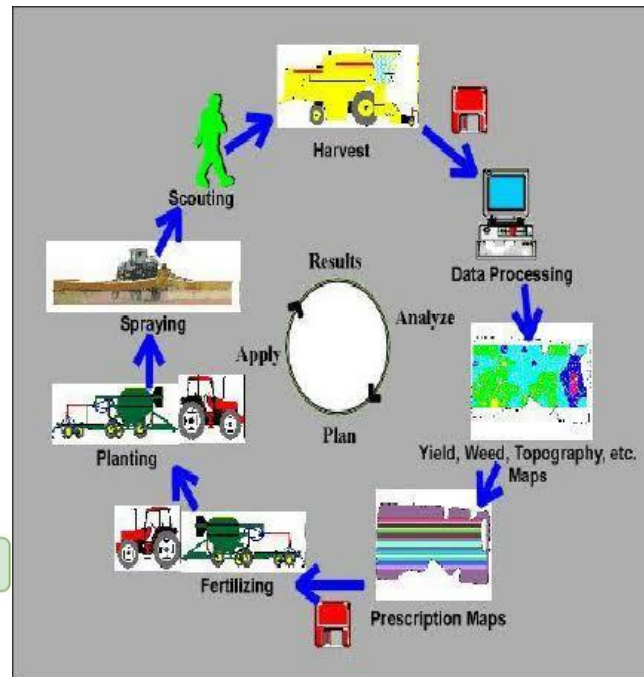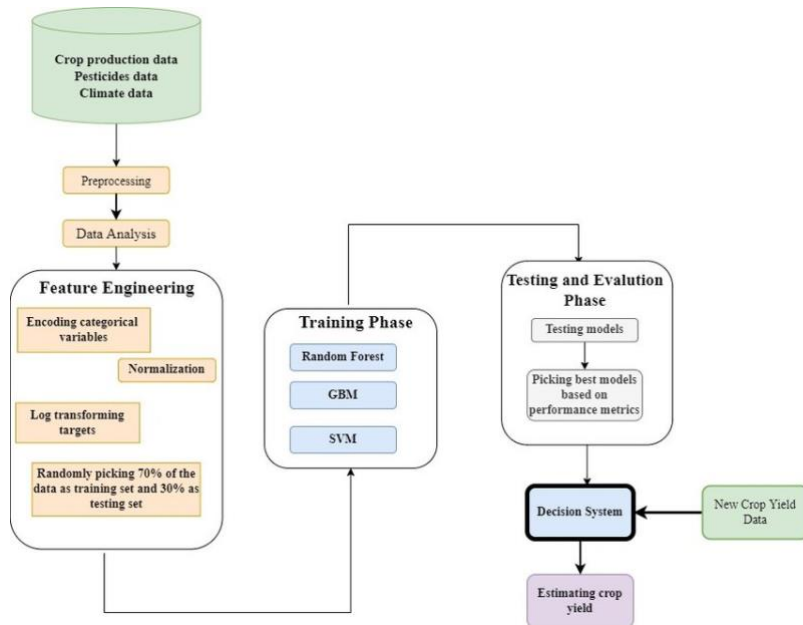
Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	We were to develop a graphical user interface specifically oriented to on farm use and research the possibility of building a generic GUI that could be used with many crop stimulators not necessarily having the same structure of input data.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Crop yield prediction using an essential task for the decision makers at national and regional levels.	Java / Python
3.	Application Logic-2	An accurate crop yield prediction model can help farmers to decide on what to grow and when to grow.	IBM Watson STT service
4.	Application Logic-3	Crop yield prediction and fertilizer suggesting application use machine learning algorithms to predict the crop yield based on various aspects.	IBM Watson Assistant
5.	Database	Statistical database on food, agriculture, forestry and management.	MySQL, NoSQL, etc.
6.	Cloud Database	It have a design philosophy of global hybrid clod scale and take advantage of the elasticity and flexibility.	IBM DB2, IBM Cloudant etc.
7.	File Storage	To protect the grains, they have to store in closed containers.	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	This contract defines hoe the two communicate with each other using requests and responses.	IBM Weather API, etc.
9.	External API-2	Agriculture API collect data like weather, air quality, pollen and soil to help users grow their agricultural products.	Aadhar API, etc.
10.	Machine Learning Model	Machine learning is an important decision support tool for crop yield prediction, including supporting decisions on what crops to growing season of the crops. Several machine learning algorithms have	Object Recognition Model, etc.

S.No			
		been applied to support crop yield prediction research.	
11.	Infrastructure (Server / Cloud)	It includes water resources and development, agricultural roads and other transportation infrastructure, agricultural equipment, machinery and information systems.	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	It presents a deep learning framework using convolutional neural networks for crop yield prediction based on environmental data and management practices.	Technology of Open source framework
2.	Security Implementations	Implementing the training model by using different inputs data. So machine will able to learn the features and extract the crop yield from the data by using machine learning techniques.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	To bring scalability for yield forecast, we describe a system that incorporates precipitation and soil properties.	Technology used
S.No	**Characteristics**	**Description**	**Technology**
4.	Availability	Crop production depends on the availability of arable land and is affected in particular by yields, macroeconomic uncertainty as well as consumption patterns.	Technology used
5.	Performance	Grain yield is the ultimate measure of crop performance and is clearly of greatest interest to plant breeders and agronomists.	Technology used