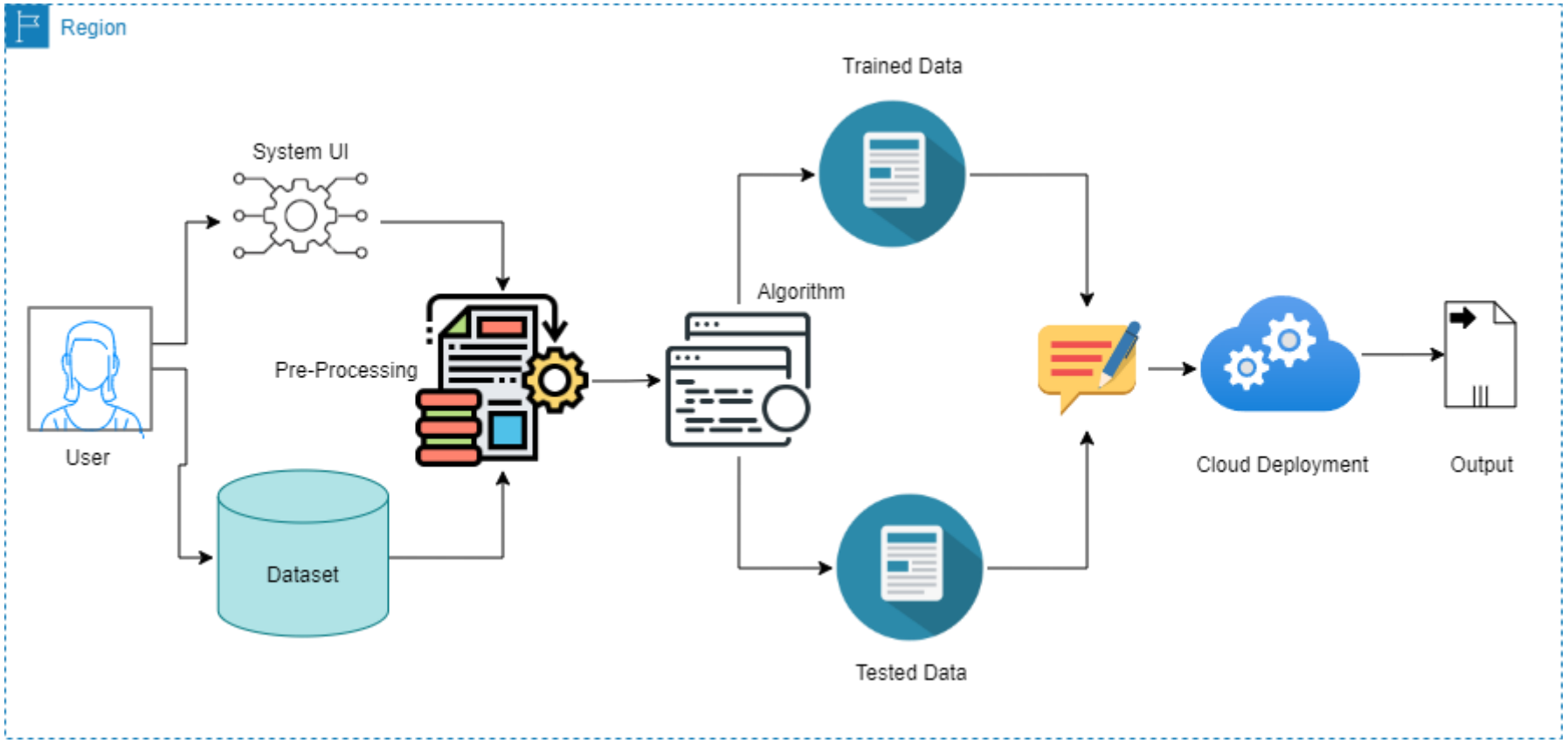
Project Design Phase-II Technology Stack (Technology Architecture & Stack)

Date	**29 October 2022**
Team ID	**PNT2022TMID21439**
Project Name	**Predicting the energy output of wind turbine based on weather condition**
Maximum Marks	**4 Marks**

Technical Architecture:



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

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User can interface with the app through login.	HTML, CSS, JavaScript.
2.	Machine Learning	Model building	Jupyter Notebook-Python

3	Deployment	Train The model on the cloud frameworks Following:	The main storage classes and resource list used.
3a.	Watson Studio	Train The model on power machine learning tool named Watson studio	IBM Watson Studio 1.0+
3b.	Kubernetes	Train The model on node red tool named Kubernetes	Kubernetes 1.8.2 (RBAC)
4.	Watson Assistant	If any Queries about Watson studio we post and get clear about queries about Watson studio.	IBM Watson Assistant
5.	Database	Google cloud SQL	MySQL, NoSQL.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant
7.	File Storage	We need to save our projects and deployments by storage	IBM Block Storage or Other Storage Service or Local Filesystem
8.	Open Weather map	To predict weather with the help of the api key	Openweathermap Api keys :(36c0639c05e38cd003ddea74d69b8822, a802b0f626c637d04185e582b5ad0d58,)
9.	IBM api	The purpose of generating and deploying models we need IBM api	IBM API keys (cROnoxEkdZHxElMwijOi2h7Q7kvTjRtpvAMzUCkCazXD, GwBW4bQSUaH4tROhskcQMbbB9uqNvz8OkKOF9l5q9R4, HzrV2Q9Ywg3EyxMO14u62Meo2RhdZjp6np6AeCoq8QlR)
10.	Machine Learning Model	Using machine learning we can improve accuracy, efficiency, System development technologies	Random forest, Linear Regression, Kmeans, Naive Bayes Classifier and Decision tree , SVR.

11.	Infrastructure (Server / Cloud)	Application Deployment on IBM Watson studio and IBM Cloud	IBM Cloud

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

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	1. Tensorflow 2. RNN 3. Theano 4. PyTorch 5. Caffe2 6. Keras 7. OpenCV 8. Scikit Learn	Scikit Learn 1.0+
2.	Security Implementations	The Data provided by the user will be surely kept safe with encryption.	AES-256, RSA, SHA-256, Hash Functions.
3.	Scalable Architecture	Three-tier architecture is a well-established software application architecture that organizes applications into three logical and physical computing tiers: the presentation tier, or user interface; the application tier, Database layer.	3-tier
4.	Availability	The model can be trained using IBM Watson Studio. IBM Cloud, API key for both Openweathermap and IBM cloud.	IBM cloud, Watson studio, API Keys.

5.	Performance	We trained the model efficiently for higher accuracy od predicted output. The output will be realtively accurate and helping to improve the prediction of energy output of wind turbines	Random Forest Regression or Random Forest Classifier with Confusion matrix, clustering too.