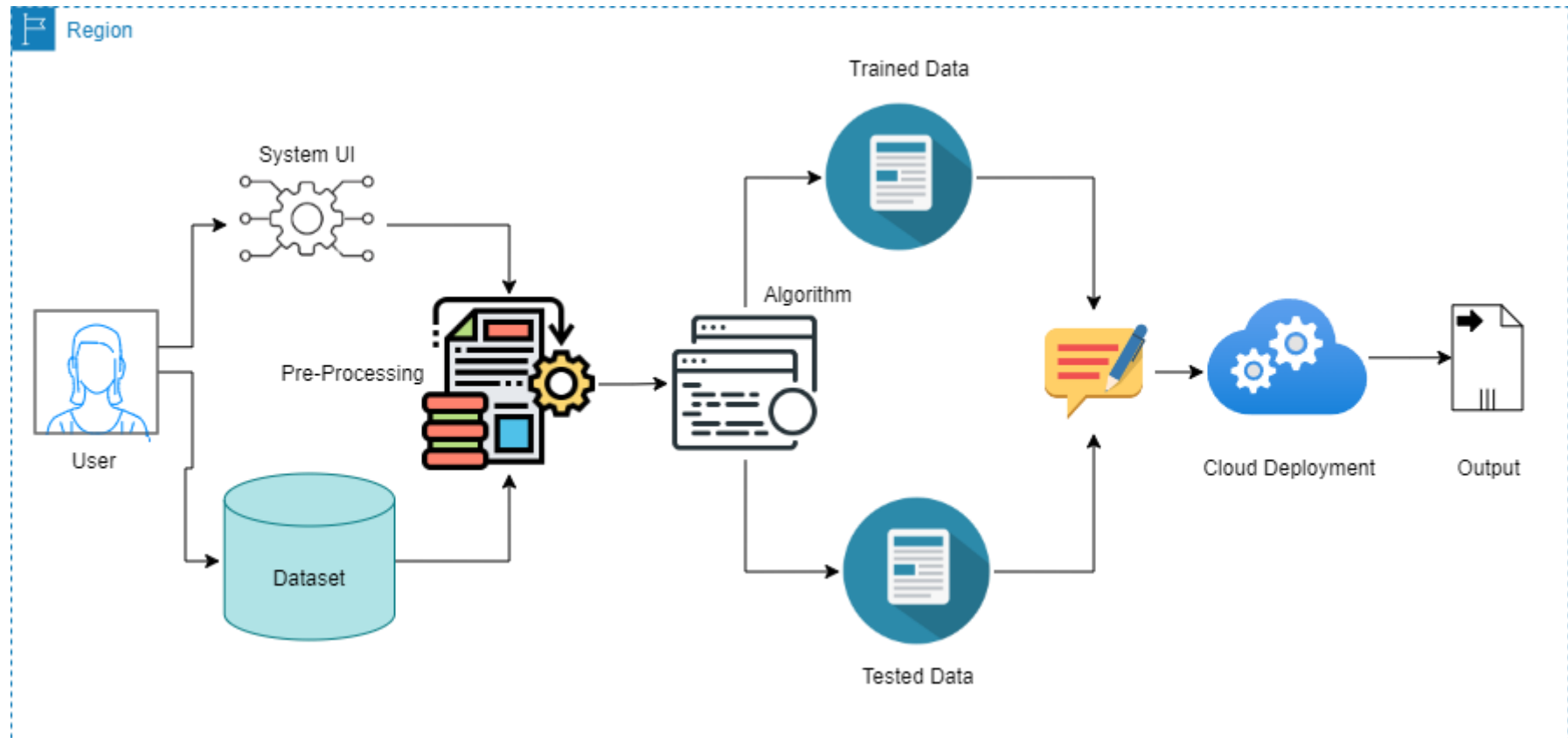


Project Design Phase-II Technology Stack (Technology Architecture & Stack)

| | |
|---------------|---|
| Date | 29 October 2022 |
| Team ID | PNT2022TMID54445 |
| 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. | Watson Studio | Train The model on power machine learning tool named Watson studio | IBM Watson Studio 1.0+ |
| 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 |
| 9. | IBM api | The purpose of generating and deploying models we need IBM api | IBM API |
| 10. | Machine Learning Model | Using machine learning we can improve accuracy, efficiency, System development technologies | Random forest, Linear Regression, K-means, 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 | <ol style="list-style-type: none">1. Tensorflow2. RNN3. Theano4. PyTorch5. Caffe26. Keras7. OpenCV8. 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 of predicted output. The output will be relatively 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. |