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

Date	21 October 2022
Team ID	PNT2022TMID32824
Project Name	Efficient Water quality analysis and Prediction using Machine learning
Maximum Marks	4 Marks

Technical Architecture:

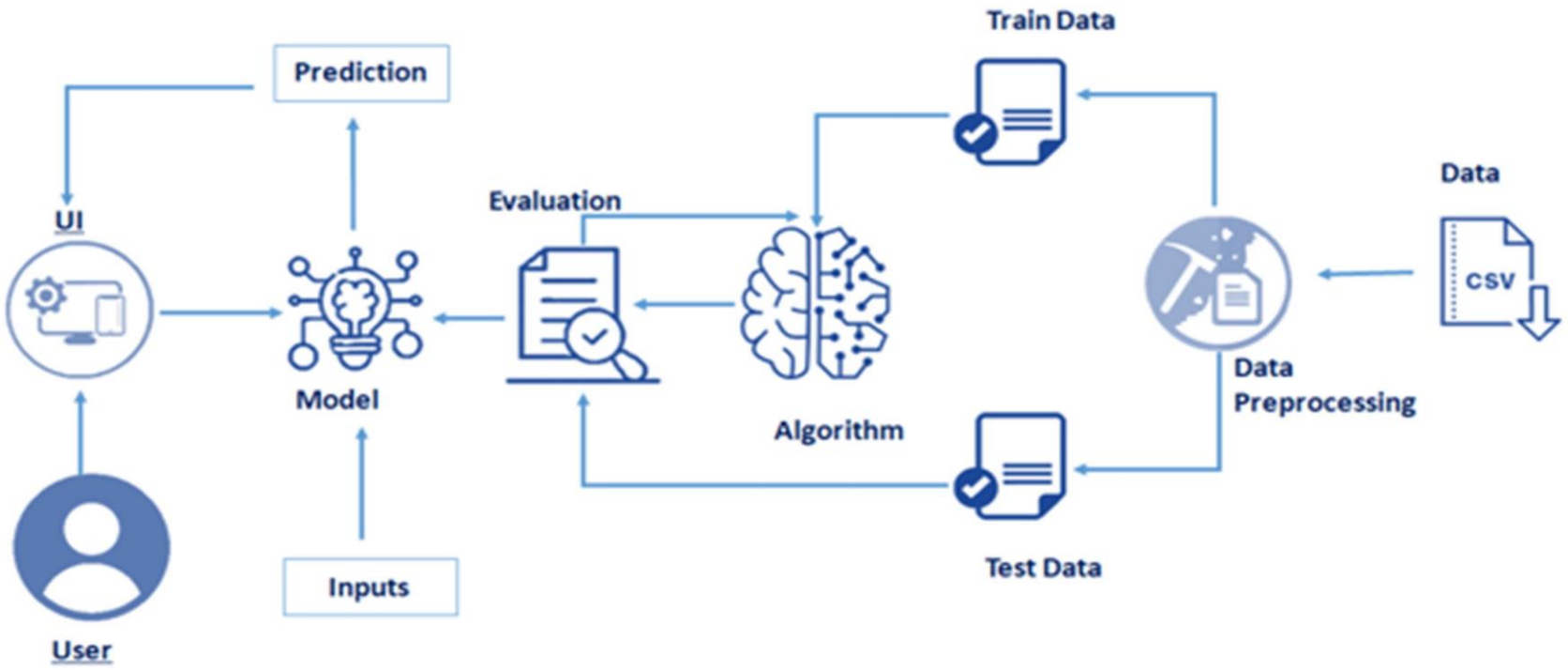

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User interaction with the Web UI	Flask, HTML, CSS, JS
2.	Application Logic-1	Variety of frameworks, libraries and supports arerequired to develop the project.	Python, Scikit-learn
3.	Application Logic-2	Helps in predicting the Water Quality Index (WQI) using various Regression and Water Quality Classification using various Classification algorithms based on various parameters involved. It also helps in predicting the potability of water samples and also recommends various purification methodsbased on the impurities present in the water sample.	IBM Watson STT service, Machine Learning Algorithms.
4.	Application Logic-3	Provides fast, accurate and consistent results of waterquality analysis and interprets the results in a easy understandable manner.	IBM Watson Assistant
5.	Database	It can be numerical, categorical or time series data.	MySQL, NoSQL, etc.
6.	Cloud Database	Enables the user to host the database On his/her own hardware without buying additional hardware.	IBM DB2.
7.	File Storage	File storage should be highly flexible, scalable, effectiveand a reliable one.	IBM Block/Object Storage or Other Storage Service or Local Filesystem

8.	External API-1	Used to access the information in the cloud.	IBM Weather API, etc.
9.	External API-2	Used to access the information for data driven decisionmaking	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Regression and Classification Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / CloudLocal Server Configuration: Install the windows version and execute the installer.	Local, Cloud Foundry, Kubernetes, etc

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Frameworks are about more than just creating a development environment. They help to define a set of standards that programmers can follow when working collectively. When programmers choose a certain framework, they adopt the specific tools and methodologies associated with that framework. This also means they must be mindful of your choice, as they may end up with processes that don't fit the needs of their project or the developers involved.	Scikit-learn, Seaborn, Keras, Flask.
2.	Security Implementations	IAM Controls and Encryptions are implemented to improve security of the application.	SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Scalable operations are implemented using APIs like HTTP, HTTPS.	Data, models operate at different sizes, speed, consistency and complexity.
4.	Availability	To ensure high availability and optimal service, the load balancer performs continual health checks of each server in the cluster, using probes to determine its eligibility for requests.	It can be availed by all kinds of customers who wish to test the quality of water they consume.
5.	Performance	Performance of the system is increased using caching methodology.	Gives correct and effective prediction, easy accessibility to the results using Machine Learning.