

Project Design

Phase-I Solution

Architecture

Date	10 November 2023
Team ID	PNT2022TMID592061
Project Name	River Water Quality Forecasting Using Machine Learning
Maximum Marks	

Solution Architecture:

Data Collection: Implement various water quality monitoring sensors at different locations in the river. For instance, use pH meters, dissolved oxygen sensors, temperature probes, turbidity meters, and nutrient analyzers. Additionally, deploy data loggers to collect sensor data continuously.

Data Preprocessing: To ensure the collected data is reliable and accurate, preprocess it using a programming language like Python. Perform tasks such as data cleaning, transformation, and temporal aggregation. Additionally, utilize machine learning techniques to process complex data.

Data Visualization: Create visual representations of the collected data to provide a comprehensive understanding of water quality. Utilize tools like Tableau, Power BI, or open-source alternatives like Python's matplotlib or seaborn libraries to create interactive graphs and charts.

Model Selection: The model is selected based on its performance and ability to handle complex data patterns. In this case, we can consider using Long Short-Term Memory (LSTM) or Convolutional Neural Networks (CNN) for predicting river water quality.

Model Training: The selected model is trained on the training dataset using appropriate algorithms and optimization techniques. This process helps the model learn the underlying patterns in the data.

Model Evaluation: The trained model is evaluated on the test dataset. This involves metrics such as mean absolute error (MAE), mean squared error (MSE), and the coefficient of determination (R^2).

Model Deployment: If the model's performance meets the required criteria, it is deployed as a service. This service can then be utilized by stakeholders to predict water quality and make informed decisions.

Maintenance and Updates: The deployed model requires regular maintenance and updates to ensure it remains accurate and relevant.

