Project Design Phase-I
Proposed Solution Template

Date	05-10-2022
Team ID	PNT2022TMID37146
Project Name	Efficient Water Quality Analysis & Prediction Using Machine Learning

PROPOSED SOLUTION :

S NO	PARAMETER	DESCRIPTION
1.	Problem Statement (Problem to be solved)	• Water quality prediction using machine learning techniques. Our model predicts the drinkability of the water based parameters such as Ph value, conductivity, and hardness of the water,.
2.	Idea / Solution description	• Water quality prediction model using the principal component analysis followed by Gradient boosting classification. • Firstly, the water quality index (WQI) is calculated using the weighted arithmetic index method. • Secondly, the principal component analysis (PCA) is applied to the dataset, and the most dominant WQI parameters have been extracted. • Thirdly, to predict the WQI, different regression algorithms are used to the PCA output. • Finally, the Gradient Boosting Classifier is utilized to classify the water quality status.
3.	Novelty / Uniqueness	• In this prediction, the main uniqueness is utilization of PCA and gradient booster regression.

4.	Social Impact / Customer Satisfaction	• This work can demonstrate how setting of more stringent water quality objectives can enhance and protect environmental assets of water resources. • This work can aid in justifying the range of water quality metrics set by government initiatives and to minimise further damages in water resources. • This work can help to quickly identify drinkability of water from new sources.
5.	Business Model (Revenue Model)	• For Analysing the metrics of each water resource a charge of Rs 100 will be collected.
6.	Scalability of the Solution	• The solution is highly scalable as we use Machine learning technique . • A Automated system can be build to aid the government, to collect the water metrics and quickly analyse and predict the water quality.