Project Design Phase–I
Proposed Solution

Team ID	PNT2022TMID15978
Project Name	Project – Efficient Water Quality Analysis and Prediction using Machine Learning

Proposed Solution Template:

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	To establish safe drinking water sources in the future, it is imperative to understand the quality and pollution level of existing groundwater. The prediction of water quality with high accuracy is the key to controlling water pollution and the improvement of water management. In this study, a Machine learning (ML) based model is proposed for predicting groundwater quality
2.	Idea description	In this study, a Machine learning (ML) based model is proposed for predicting groundwater quality and compared with three other machine learning (ML) models, namely, random forest (RF), extreme gradient boosting (XGBoost), and artificial neural network (ANN). A total of 226 groundwater samples are collected fan agriculturally intensive areas of India, and various physicochemical parameters are measured to compute the entropy weight-based groundwater quality index (EWQI).
3.	Uniqueness	▪The main reason behind the success of this ML technique is that it ignores the requirements of selective features that are most representative compared to that of traditional ML algorithms. ▪The ML technique is a self-deterministic approach that learns features to discover the correct representation required for the given task the ML technique is a self-deterministic approach that learns features to discover the correct representation required for the given task. ▪ML methods can progressively construct high level attributes from the given dataset

4.	Social Impact	Generation of unprocessed effluents, municipal refuse, factory wastes, and junking of compostable and non-compostable effluents has hugely contaminated nature-provided water bodies like rivers, lakes, and ponds. Therefore, there is a necessity to look into the water standards before usage. This is a problem that can greatly benefit from Artificial Intelligence (AI). Traditional methods require human inspection and are time-consuming. Automatic Machine Learning (AutoML) facilities supply machine learning with the push of a button, or, on a minimum level, ensure to retain algorithm execution, data pipelines, and code, generally, are kept from sight and are anticipated to be the stepping stone for normalizing AI.
5.	Business Model	Assessment of water quality using conventional methods causes losses in eco-nomic value, which in turn affects the decision-making capacity for water quality management programs. Therefore, to tackle these issues, it is essential to adopt a potential and cost-efficient approach for quick and accurate assessment of water quality. In our project, the application of machine learning (ML) techniques can be an effective and reliable approach for the evaluation of water quality.
6.	Scalability of the Idea	•Objective weighting system-based approaches are more reliable because they consider local variations in a dataset during the computation process. •This ML technique is an extension of the artificial neural network method; it has additional complex architectures that make this approach suitable for managing multidimensional inputs because of its high model configuration flexibility, greater generalization power, and robust learning capacity.