

Project Design Phase-I
Proposed Solution

Date	19 September 2022
Team ID	PNT2022TMID35567
Project Name	Efficient water quality analysis and prediction using Machine Learning
Maximum Marks	2 Marks

Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<ul style="list-style-type: none">• The quality of water is a major concern for people living in urban areas. The quality of water serves as a powerful environmental determinant and a foundation for the prevention and control of waterborne diseases.• Water makes up about 70% of the earth's surface and is one of the most important sources vital to sustaining life. Rapid urbanization and industrialization have led to a deterioration of water quality at an alarming rate, resulting in harrowing diseases. Water quality has been conventionally estimated through expensive and time-consuming lab and statistical analyses, which render the contemporary notion of real-time monitoring moot.• However predicting the urban water quality is a challenging task since the water quality varies in urban spaces non-linearly and depends on multiple factors, such as meteorology, water usage patterns, and land uses, so this project aims at building a Machine Learning (ML) model to Predict Water Quality by considering all water quality standard indicators.
2.	Idea / Solution description	<ul style="list-style-type: none">• The proposed model predicts water quality by considering all water quality standard indicators using PH,DO,etc.• we need to train the datasets to run smoothly and see an incremental improvement in the prediction rate

		<p>using Random Forest Regression algorithm on our dataset.</p> <ul style="list-style-type: none"> We will be building a web application that is integrated to the model built. A UI is provided for the uses where he has to enter the values for predictions. The enter values are given to the saved model and prediction is showcased on the UI.
3.	Novelty / Uniqueness	<ul style="list-style-type: none"> With machine learning techniques, the implementation was done by the Water Quality Index (WQI) which is a single numeric index that mirrors the overall quality of water with high accuracy. The heart of the project depends upon the prediction of the quality of the water. As abundant as algorithms are present in order to achieve such a goal, it is mandatory to select the best and the most efficient algorithm to finalize the predicted value. Web app is developed as UI is provided for the user where he has to enter the values for predictions.
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> Water makes up about 70% of the earth's surface and is one of the most important sources vital to sustaining life. Rapid urbanization and industrialization have led to a deterioration of water quality at an alarming rate, resulting in harrowing diseases. Most of the research either employed manual lab analysis, not estimating the water quality index standard, or used too many parameters to be efficient enough. With machine learning techniques, the implementation was done by the Water Quality Index (WQI). Web app is developed as UI is provided for the customer/user where he has to enter the values for predictions.
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> A web application that is integrated to the model built. A UI is provided for the uses where he has to enter the values for predictions. The enter values are given to the saved model and

		<p>prediction is showcased on the UI and deploy it on IBM cloud.</p> <ul style="list-style-type: none"> • We can sell it for the prediction of water in various environments if the model performs well ,also can make the app as premium one.
6.	Scalability of the Solution	<ul style="list-style-type: none"> • The proposed can be implemented in realtime water quality analysis by getting water sample using devices(Internet Of Things). • Real time applications can be used in various places like schools,colleges etc. • Machine learning model integrated with IOT can make users more comfortable and to use in realtime.