

**Project Design Phase-II**  
**Solution Requirements (Functional & Non-functional)**

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|---------------|--|
| Date          | 03 October 2022  |
| Team ID       | PNT2022TMID52625   |
| Project Name  | Efficient Water Quality Analysis and Prediction using Machine Learning |
| Maximum Marks | 4 Marks  |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task)   |
|--------|-------------------------------|--|
| FR-1   | User Registration             | Registration through Form<br>Registration through Gmail<br>Registration through LinkedIn   |
| FR-2   | User Confirmation             | Confirmation via Email<br>Confirmation via OTP   |
| FR-3   | Enter the input               | Get the input values via form and check the data   |
| FR-4   | Executive administration      | Early warning/forecast monitoring is one of two separate roles that are included in the regulation of monitoring the water environment state and regulatory compliance, such as pollution event emergency management |
| FR-5   | User Requirements             | The user needs an accurate and exact result  |
| FR-6   | Data Preprocessing            | From the raw dataset, obtain the tested and trained data   |
| FR-7   | Data Handling                 | Metrics for the various water bodies' water quality included in the file   |
| FR-8   | Quality analysis              | Use multiple models to analyse the data on the water's obtained PH, TDS, and temperature levels, among other water quality indicators  |
| FR-9   | Model prediction              | Based on the water quality index, the confirmation displays the machine learning prediction (Good, Partially Good, Poor) and the proportion of each parameter that is present  |
| FR-10  | Remote Visualization          | Visualisation of future forecasts using charts based on present and past values of all the parameters  |

### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description   |
|--------|----------------------------|---|
| NFR-1  | <b>Usability</b>           | A user-friendly web application, the system provides natural interaction with the users   |
| NFR-2  | <b>Security</b>            | The website is virus-free and did not request any authorization. The model has a strong security system since the user's information won't be shared with any other sources   |
| NFR-3  | <b>Reliability</b>         | A wide variety of water values are trained in the model, increasing forecast accuracy. The model may be greatly expanded by adding more datasets  |
| NFR-4  | <b>Performance</b>         | Get the results quickly   |
| NFR-5  | <b>Availability</b>        | Available on the internet at any moment. As long as the user has access to the system, it should be accessible until the user terminates it. The system responds to user requests more quickly, and recovery is completed faster    |
| NFR-6  | <b>Scalability</b>         | It is a lightweight application, the users can access the website through mobile phones, tabs, desktop and laptop. It produces an effective result and has the capacity to alter the system's performance depending on the datasets |