WATER QUALITY ANALYSIS

Phase 2: Innovation

In this innovation part we calculate the drinking water chemical properties level such as pH, hardness, solids, chloramines, sulphate, conductivity, organic carbon, turbidity level. because in drinking water these properties levels are must to drink if it is unstable, we may have some disease in future.

Steps to put design into transformation:

Data Collection: Collect historical water quality data from sensors and monitoring equipment. Ensure that the data is well-structured, time-stamped, and covers a diverse range of scenarios.

Data Preprocessing: Clean the data by handling missing values, outliers, and noise. Normalize or scale the data to make it suitable for analysis.

Feature Selection: Identify relevant features (water quality parameters) and preprocess them as needed for anomaly detection.

Model Selection: Choose an appropriate anomaly detection technique based on the nature of your data and the problem at hand. Experiment with different models to determine the most effective one.

Model Training: If using machine learning or deep learning models, split the data into training and validation sets. Train the model on the training data and fine-tune hyperparameters.

Anomaly Detection: Apply the trained model to the entire dataset to detect anomalies in real-time or near real-time. Monitor the output for any significant deviations from expected behavior.

Alerting and Reporting: Implement an alerting system to notify relevant stakeholders when anomalies are detected. Create reports summarizing the anomalies and their potential impact on water quality.

Continuous Monitoring: Continuously update and retrain the model with new data to adapt the changing conditions and improve its accuracy over time.

Predictive Modelling: Developing predictive models can forecast water quality parametersbased on historical data, weather conditions, and other relevant factors. These models can provideearly warnings of potential water quality issues.

Data Visualization: Creating interactive and user-friendly data visualization tools that allow stakeholders, including the public, to access and understand water quality information easily. Visualizations can help convey complex data in an understandable manner.

Automated Sampling: Employing robotic or autonomous sampling systems that can collect water samples at precise intervals and locations. These systems can be programmed to respond to specific events or triggers.

Water Quality Informatics: Developing dedicated water quality informatics systems that integrate data analysis, modeling, and reporting capabilities into a unified platform for water quality management.

Predictive Maintenance: Applying data analysis to predict maintenance needs for water treatment facilities and equipment, ensuring their optimal performance and minimizing downtime.