# Design Document

This document covers information pertaining to the design requirements of the entire system.

## System Requirements

* Measure water level of the container
* Check weather the pump is on or off
* Show the data on the dashboard

## System Specifications

* ESP32 is integrated with ultrasonic sonic(HC-SR04) and DHT-22 sensors.
* Water level is going to be calculated from the distance value obtained using ultrasonic sensor.
* Both water level and motor status are sent to om2m.
* Backend written using django subscribes to the om2m data container.
* Om2m will send data, which is received by the backend.
* Frontend written using React requests data from the backend.
* Backend uses Mysql database to store data.

## Stakeholders

* Owner of the container if it is a private tank
* Govt authorities if it is a public place like a dam.

## Main Components

### Microcontroller

ESP32 NodeMCU is used to integrate with the sensors and send the data to Om2m server.

### Onem2m server

Used as middle node between microcontroller and our application(backend). It accepts data from esp32 and send its to backend.

### Backend

It accepts data from om2m and stores it in a database. Useful for data processing. Gives response to the frontend.

### Frontend

It provides a dashboard to the user. Takes data from the backend and displays it in dashboard.

### Fog Node

It will be in the same network as the microcontroller. When that LAN disconnects to the internet it accepts data from esp32 and sends data when the LAN is connected to the internet.

### Ultrasonic Sensor

It measures the distances. Used to find out the water level.