

Swatch Bharath Smart Dustbin

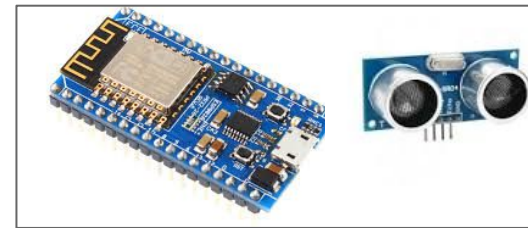
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Problem Statement

To support Swach Bharath program you are asked to develop a GIS-based application that will help in the efficient collection and disposal of garbage. Develop an Internet of Things (IOT) based smart GIS application for managing Garbage collection and disposal in IIT Bombay.

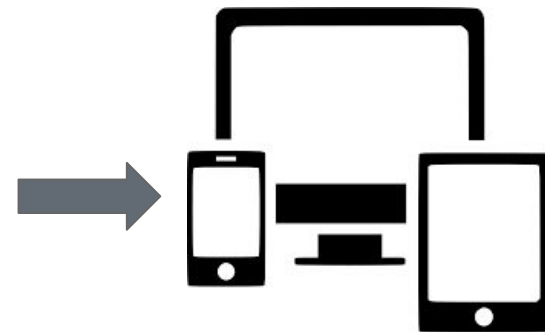
System Design



MCU & Sensor Unit



Cloud Backend



Thin Web Client

Hardware

MCU: ESP8266



Sensor: HC-SR04 Ultrasonic Sensor



Choice of Communication Protocol

HTTP

Web of Things

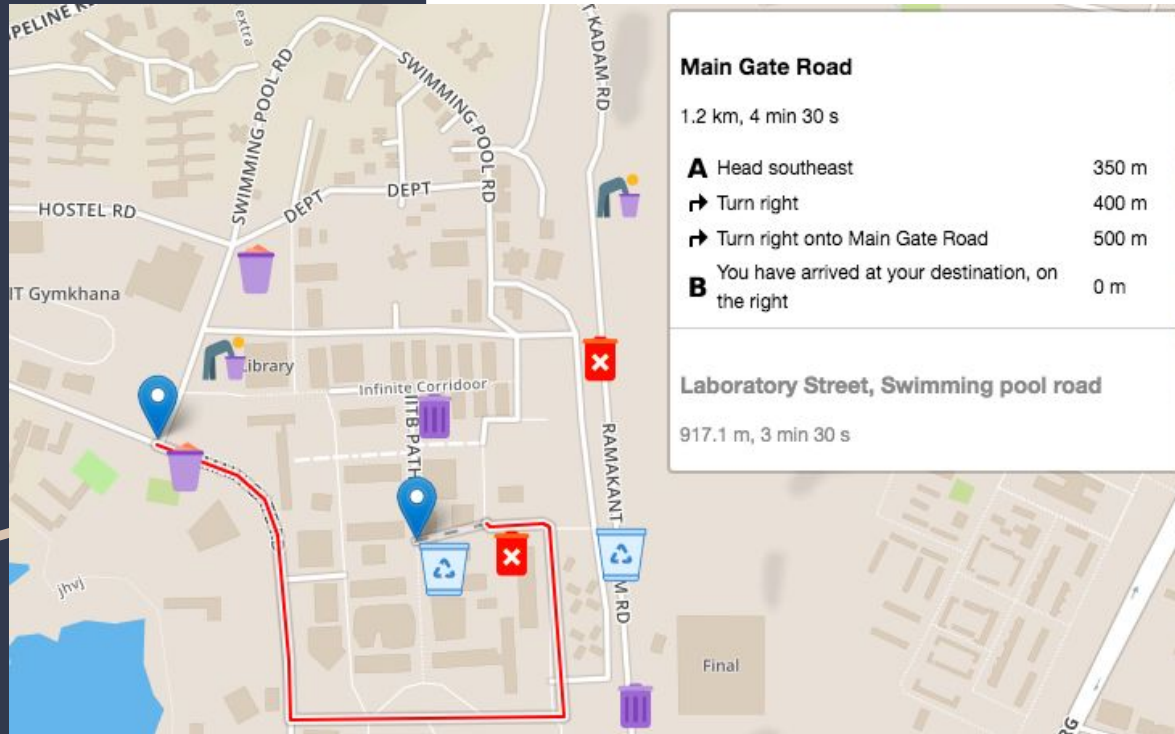
Backend



Firebase

Choice of Web Map Service

Leaflet



Functionalities

- i. Display status of all bins realtime in a web map
- ii. Give paths to all active bins
- lii. Subscription System - Notifications for Subscribed Users (**NOT IMPLEMENTED YET**)

Working

i. Sensor Reading \Rightarrow Firebase RealTime DB

ii. Firebase RealTime DB \Rightarrow Firebase Hosted Web Map

Demo

<https://sensor-hub-dummy.firebaseio.com/>

Limitations

- i. Sensor Unit needs improvement
- ii. Demo Leaflet Routing Server

Improvements

i. Sensor Unit :

⇒ Better Surface Estimation

⇒ GPS

ii. Custom Leaflet Routing Server

END

