SMART STICK FOR BLIND PEOPLE

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Smart Stick For Blind People

- Introduction
- Need of the concept
- Components Required
- Design Methodology
- Future Scope

Introduction

- Smart blind stick can be used by the visually impaired people for walking safely without colliding into obstacles.

- It includes an ultrasonic sensor for detecting obtacles along with buzzers and a mini speaker to warn the user about these obstacles .

- When the object is within 10 to 20 cm of the ultrasonic sensor, the buzzers beep alerting the blind person of the nearby object. And when the obstacle is within 10 cm of the sensor, an audio clip saying “Alert the object is near” is played.

Need of the concept

- Mobility can be very challenging for blind people. and it leads to frequent accidents.Our project aims to solve this problem for the visually impaired people. This smart stick will warn blind people about obstacles and help them avoid obstacles in front of them.
- In a technology-controlled world where people strive to live independently, this smart stick for blind people aids them in achieving personal independence.
- It's main features are that it is simple to use, has low cost and non bulky structure.

Components Required-

Hardware

- Ardino Uno
- Ultrasonic Sensor HCSR04
- 2 Buzzers
- Mini Metal Speaker with wires (8 ohms 0.5W)
- 9V DC Battery
- Jumper Wires
- Breadboard

Software

Ardino IDE

A text editor for writing code. It connects to the Arduino hardware to upload programs and communicate with them.

Audacity

- Audacity is a free and open-source digital audio editor and is used to change the normal audio file (mp3 format) to 16 bit PCM and project rate to 8000Hz.

EncodeAudio

- It is a software used to convert the audio to base64 and use the result string in the code for playing audio on speaker using Arduino.

Design Methodology

STEP 1. PURPOSE AND REQUIREMENTS SPECIFICATION

- **Purpose-**To develop smart stick for blind people that will help them in obstacle detection and save them from colliding into objects while walking .

- **Behavior**- Our system has the functions for sensing obstacles within different ranges with the help of ultrasonic sensor and indicates these ranges via buzzers and speaker. The buzzers beep when the obstacle is detected in the range of 10 to 20 cm. And the speaker plays an audio message “Alert! the object is near” when the obstacle is detected within 10cm of the sensor.

- **System Management Requirement**- The system should provide accurate obstacle detection within 20cms in the path of the user and alerts the user via beeping buzzers or playing an audio clip.

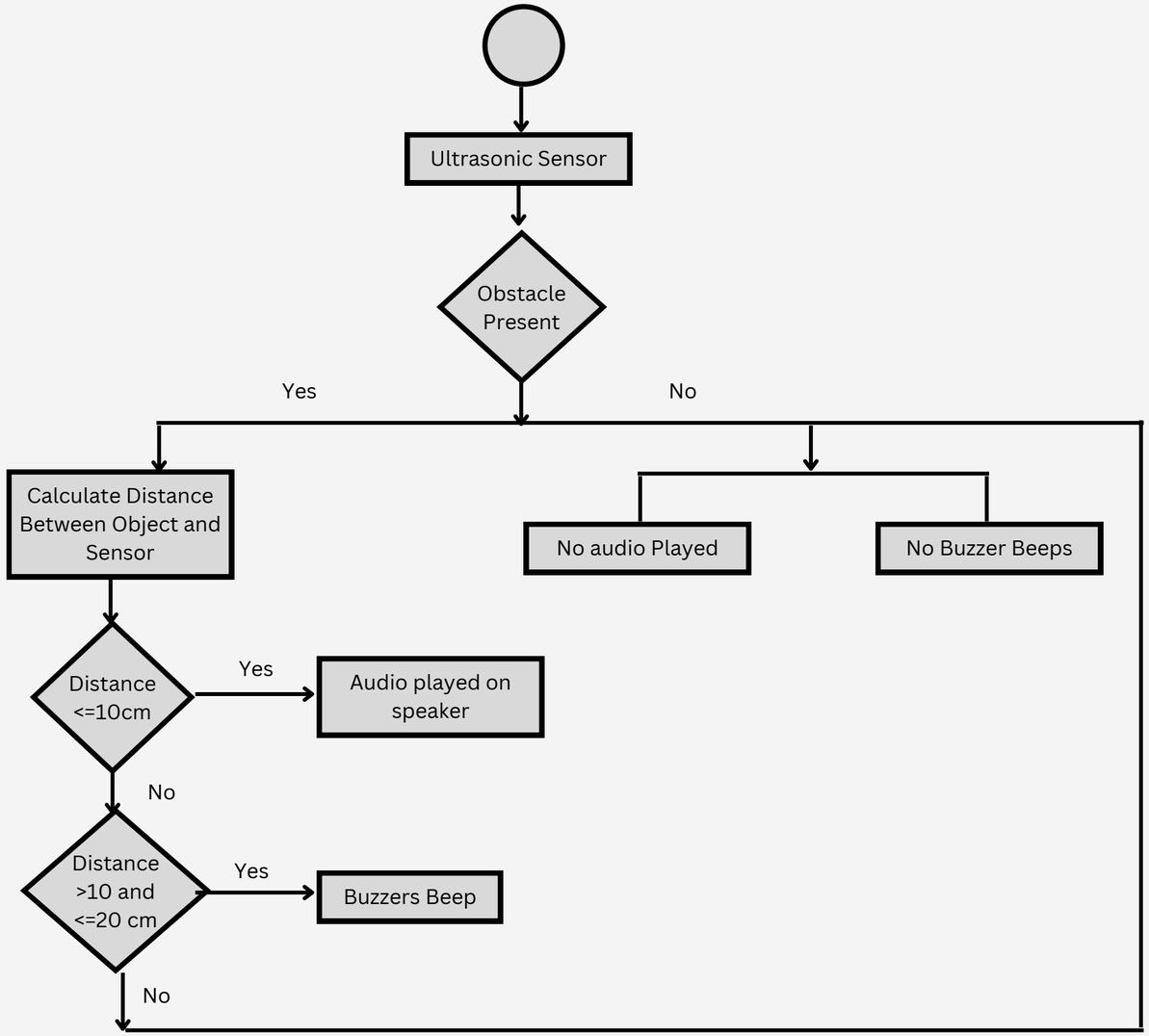
Design Methodology

STEP 1. PURPOSE AND REQUIREMENTS SPECIFICATION

- **Data Analysis Requirements-** The system will classify the data(obstacle presence) into two categories -obstacle detected and obstacle not detected.
- **Application Deployment Requirement**-Application should be deployed locally by the user.
- **Security Requirement**- The system does not have any user security capabilities.

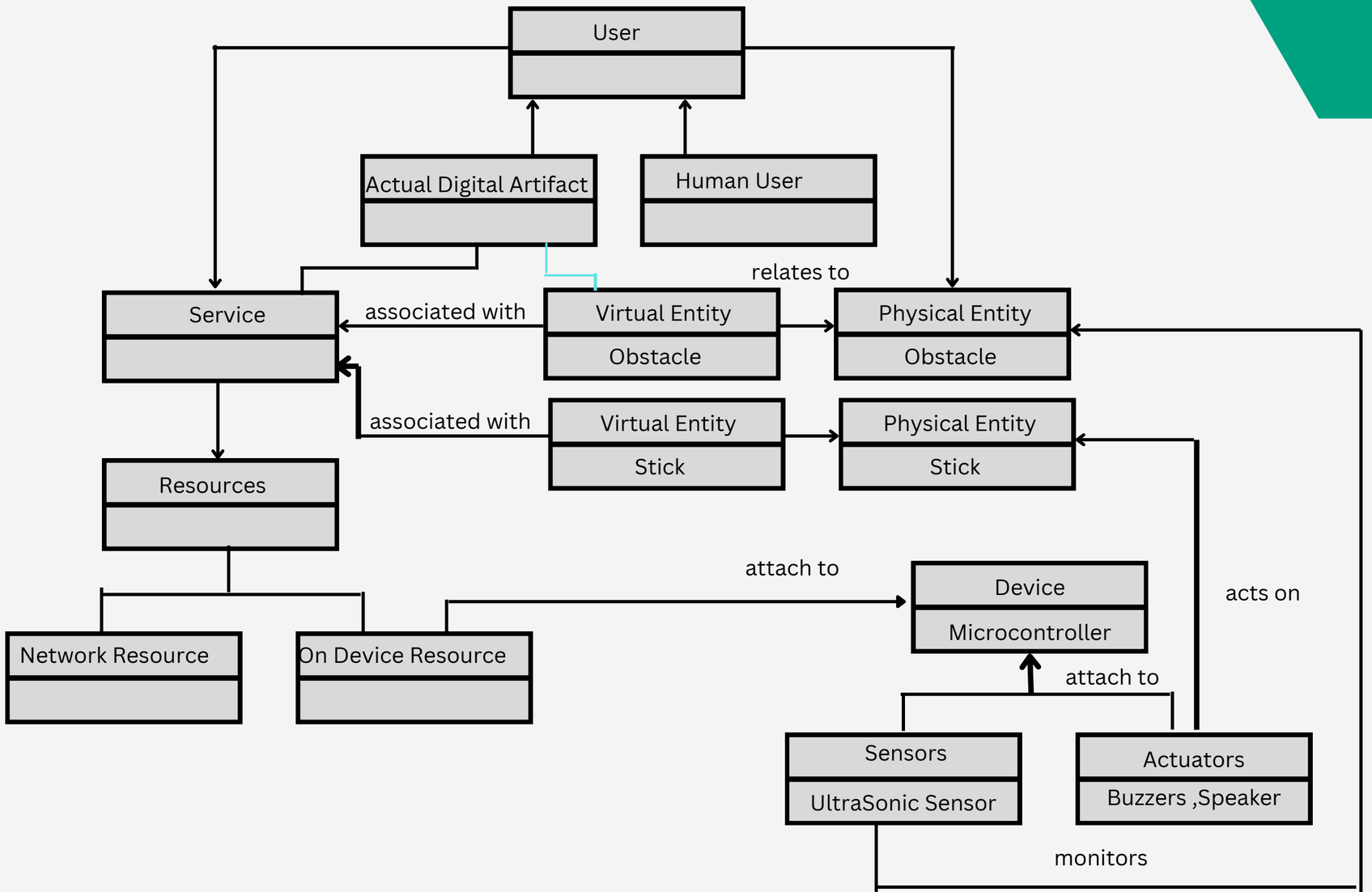
Design Methodology

STEP 2. PROCESS MODEL SPECIFICATION



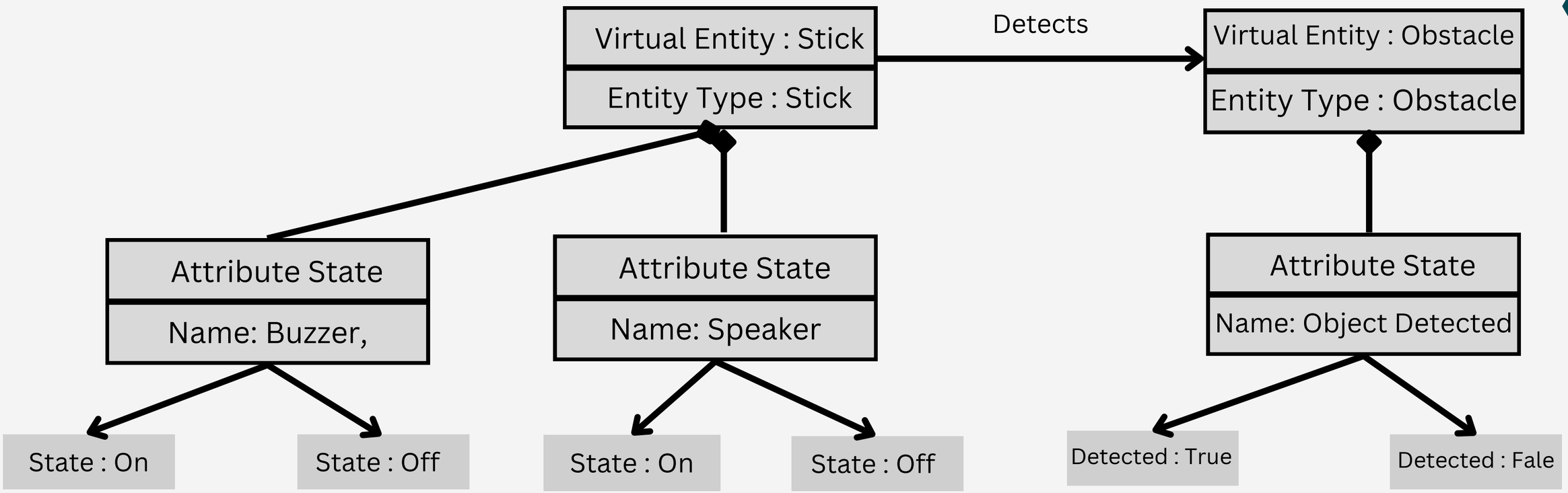
Design Methodology

STEP 3. DOMAIN MODEL SPECIFICATION



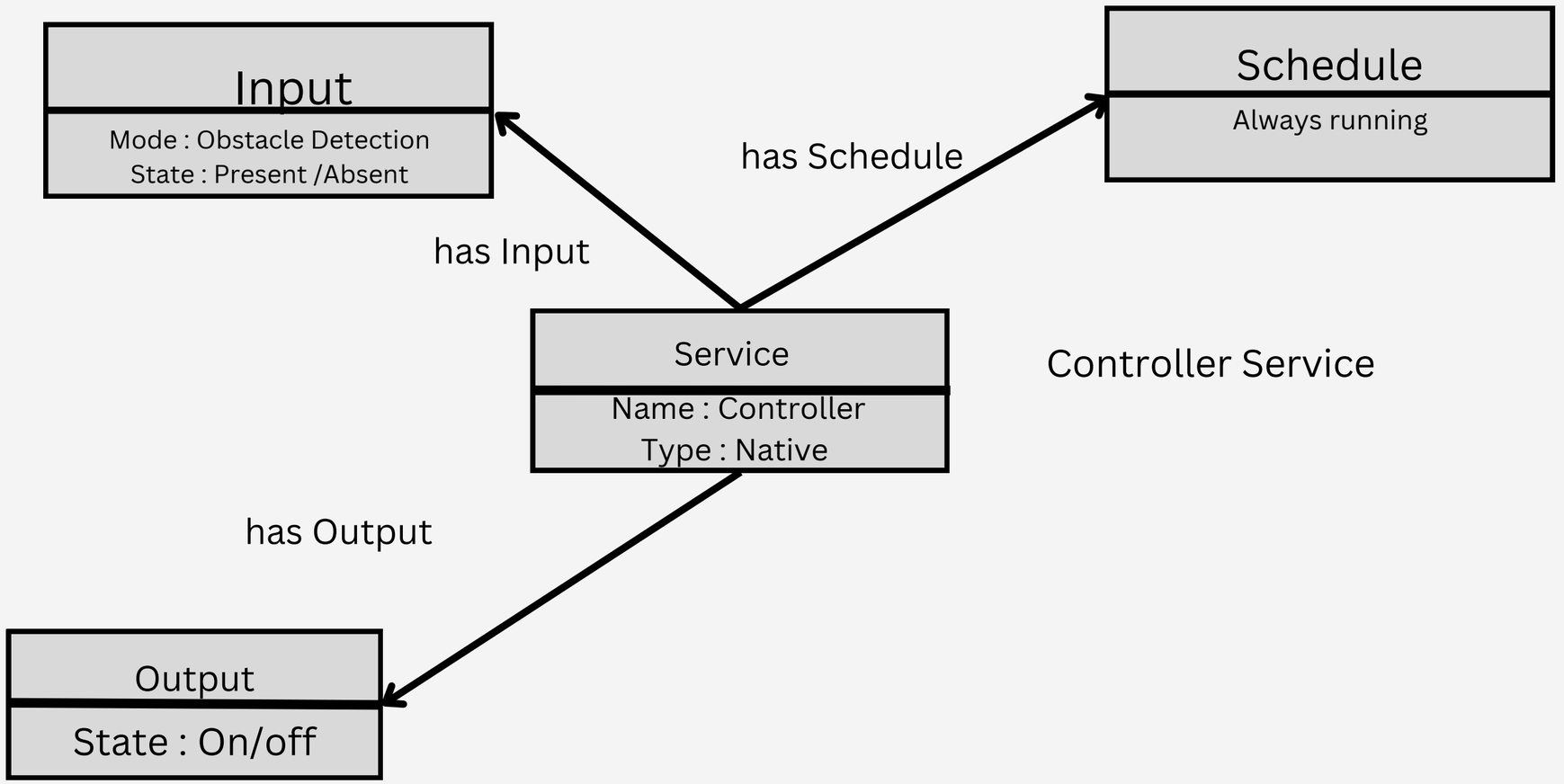
Design Methodology

STEP 4. INFORMATION MODEL SPECIFICATION



Design Methodology

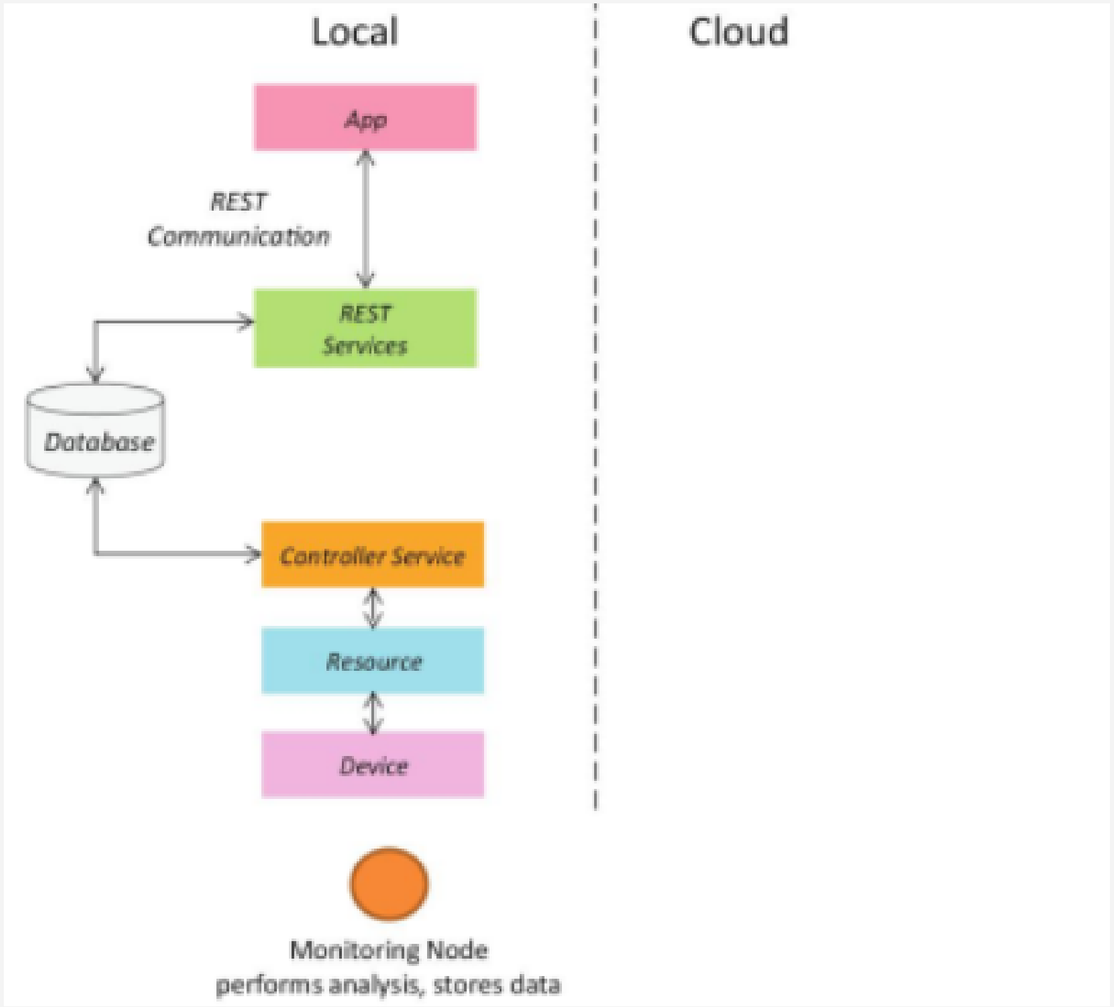
STEP 5. SERVICE SPECIFICATION



Design Methodology

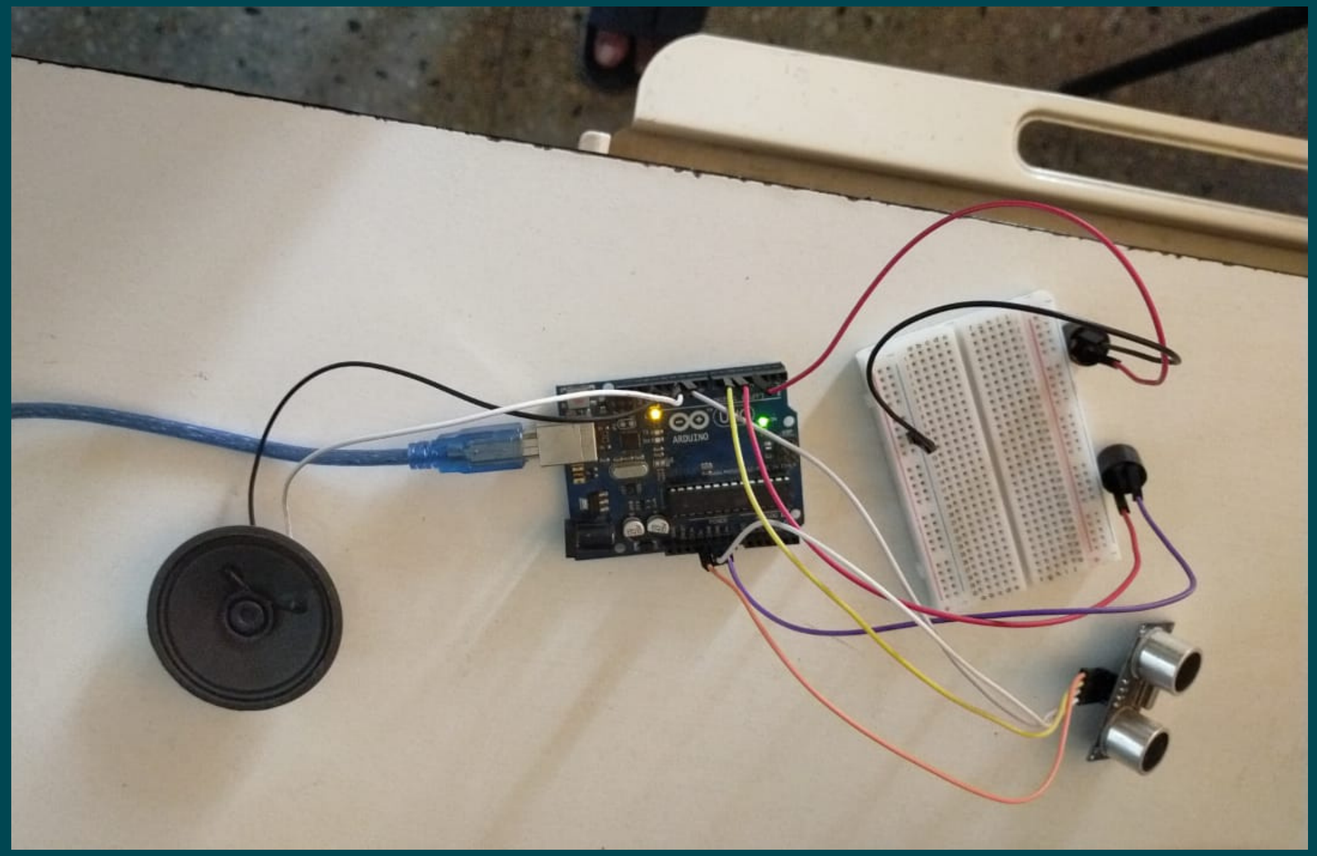
STEP 6. IOT LEVEL SPECIFICATION

IOT LEVEL 1



Design Methodology

STEP 9. DEVICE AND COMPONENT INTEGRATION



Output Serial Monitor ×

Not connected. Select a board and a port to connect automatically.

```
Distance: 207
Distance: 207
Distance: 206
Distance: 206
Distance: 206
Distance: 206
Distance: 207
Distance: 7
Object Alert
Object Within 10cm
Distance: 20
Object Alert
Object between 10cm to 20cm
Distance: 20
Object Alert
Object between 10cm to 20cm
Distance: 21
Distance: 21
Distance: 22
Distance: 21
Distance: 21
Distance: 22
Distance: 21
Distance: 22
```

Future Scope

- Adding GSM module to the smart stick to support messaging
- Adding GPS module to the smart stick for tracking the blind person

THANK YOU!