weClear™

The Central Hub to detect, alert, prevent and monitor hoarding weClear hoards ☺

Our Solution:

SINGAPORE MANAGEMENT UNIVERSITY × minds
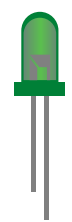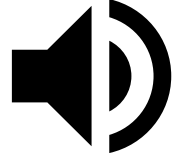
Detect	Alert	Prevent	Monitor

Detect: Weight Sensor + Distance Sensor

Alert: LED Light + Speaker Alarm

Prevent: Telegram Notifications for caregivers — "Hoarding level too high!"

Monitor: Data Visualisation for social workers
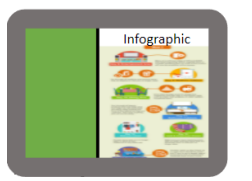
Clutter is detected using weight sensors and distance sensors. When the hoarding level gets too high, an alert will be sent via flashing LED lights, and an alarm sounding on the spot to inform the client that there is too much clutter. Telegram notifications will be sent to social workers or caregivers working closely with the client when hoarding level is too high. The non-profit organisation staff will receive data in 4 hour intervals and get to monitor data over time via the data visualisation. This process repeats itself.

Our users:

Elderly
- May have mobility issues
- Probably living alone
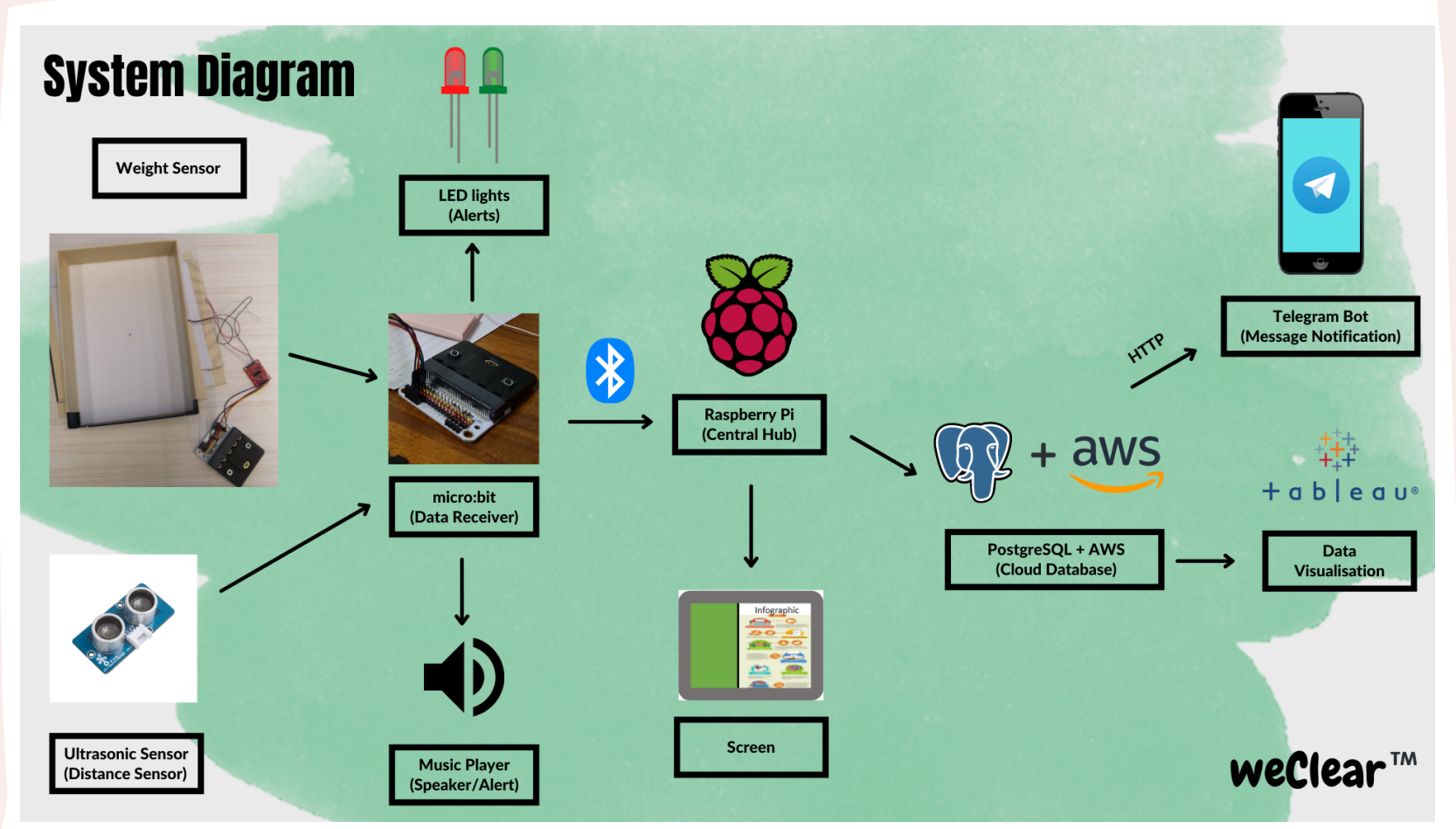- Only able to understand simple colours & sound

Family Members
- Main caregivers
- May not have time to constantly check in on the elderly

Social Workers
- Main caregivers if no family available
- Wants to intervene early
- May have to monitor many clients

System Diagram:

System Diagram: Weight Sensor → micro:bit (Data Receiver); Ultrasonic Sensor (Distance Sensor) → micro:bit (Data Receiver); LED lights (Alerts); micro:bit (Data Receiver) → Music Player (Speaker/Alert); Screen; Bluetooth → Raspberry Pi (Central Hub) → PostgreSQL + AWS (Cloud Database) → Data Visualisation (tableau); HTTP → Telegram Bot (Message Notification). weClear™
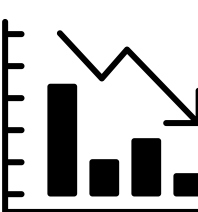
Our Challenges:

Prototype
- Finding the right tools to build the structure (we accidentally split one acrylic board into 2 while sawing it)

Environmental Constraints
- Client's home might not have WiFi
- Local system to alert client if clutter level too high can be used without WiFi
- Messaging system can be done with data

Results
- Sensor results not instant, takes time to measure and gives a few readings before giving accurate reading
(process sensor result after a delay)

Future improvements:

Functionality
- Add a WiFi Router powered by a data SIM card to send messages from our central hub to the client's caregivers and data to the non-profit organisation

Telegram Bot
- Add a tidy guide for the caregivers, alongside the reminder message

Packaging
- Properly hide the wires and make a proper industrial-level casing and use a constant power source instead of battery.

By: Charlotte, Daniel, Jessica, Ming Ze, Zhe Bin | Guiding Lights: Ariel & Pius