Community Fridges Usage Data Acquisition

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Community Fridges

RVA Community Fridges (RVACF) is a nonprofit group operating 14 fridges in greater Richmond, providing free food to combat food insecurity

Problem:

- 20% of children, 21% of adults in RVA are food insecure
- Data collection currently relies on manual methods

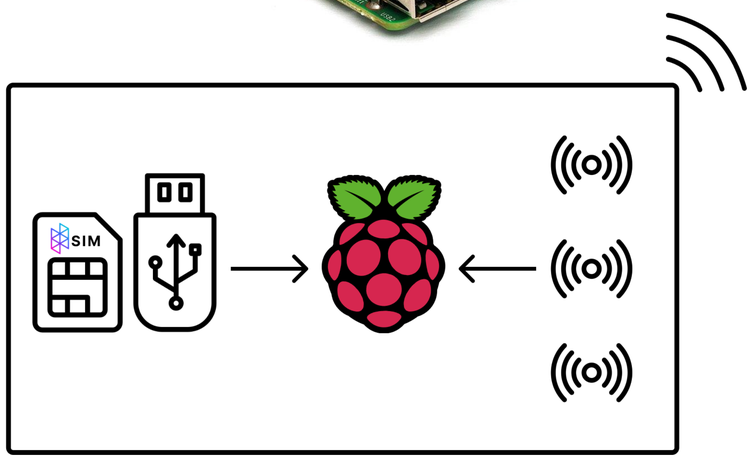
Objectives:

- Automate data collection from door sensors, fridge scales, and temperature sensors to open funding opportunities for RVACF
- Transmit data from fridges to VCU for cloud storage
- Send automated maintenance updates to RVACF community
- Integrate user-friendly dashboard into the existing RVACF website to display fridge data

Data Acquisition

Approach:

- Install sensors on each fridge:
  - Door sensors track fridge usage
  - Fridge scales monitor the available space
  - Temperature sensors report current temperatures
- Equip each fridge module with a cellular modem
  - Raspberry Pi monitors sensors and packages data
  - Hologram SIM cards connect fridge sensors to the internet.



Data Transmission

Server:

- USB cellular modems upload sensor data from Raspberry Pi to a central database hosted on AWS
- An RVACF Discord Bot sends alerts to volunteers
- The RVACF website displays most recent information
- A separate web service for organizational leaders displays in-depth data insights

Access:

- Dashboard on RVACF website displays usage, temperature, and available space for each fridge
- Discord bot sends maintenance and capacity alerts to RVACF members