

TO ONLINE SHOP, TO NOT ONLINE SHOP

SENIOR DESIGN MAY 2020: TEAM 19

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Motivation

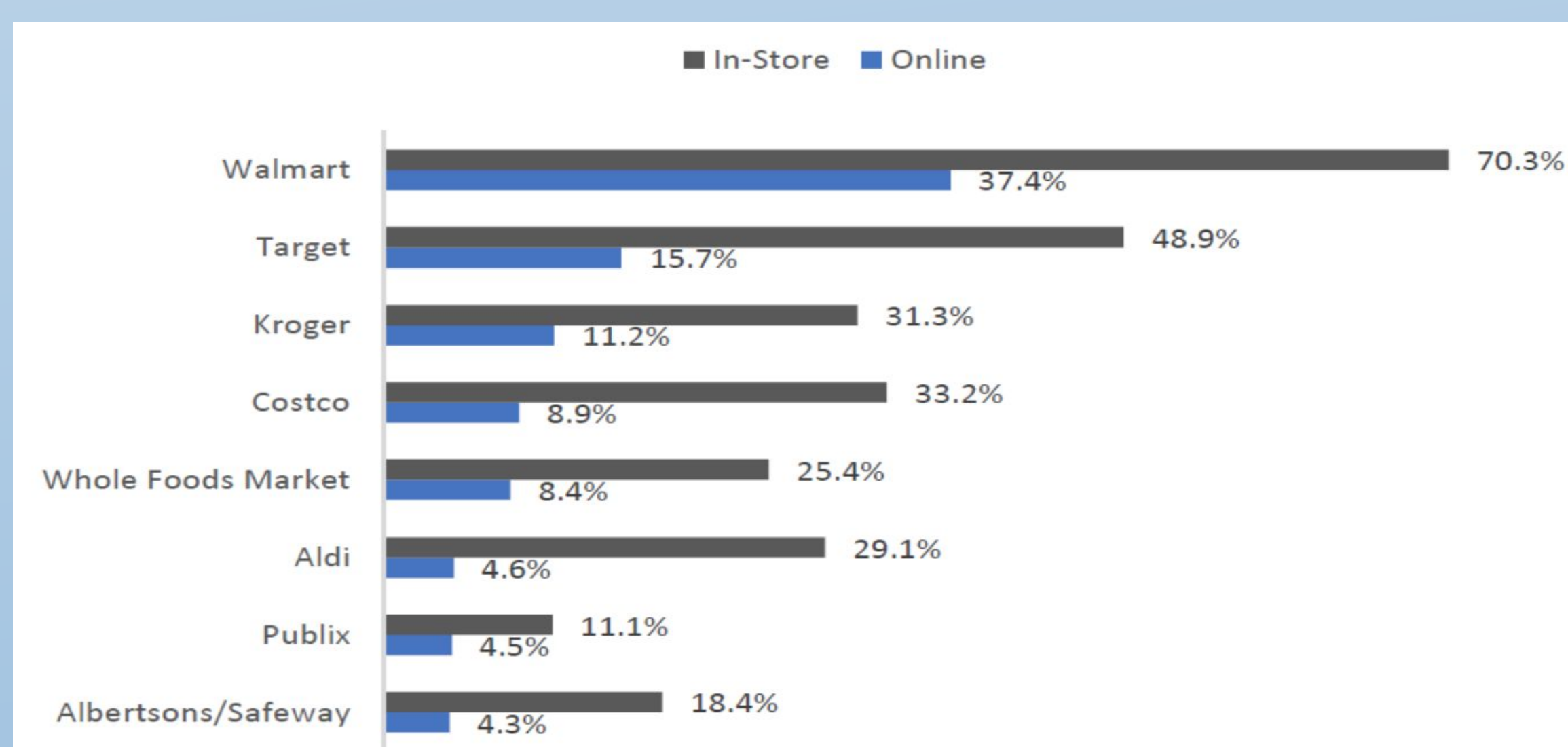
Online Shopping

- E-Commerce growing 3 times faster than retail
- Companies have made it easier to buy groceries online

In-Store Shopping

- 56% of shoppers would like to see and touch items before purchase
- Marketing trend towards increasing in-store purchases using location aware advertising

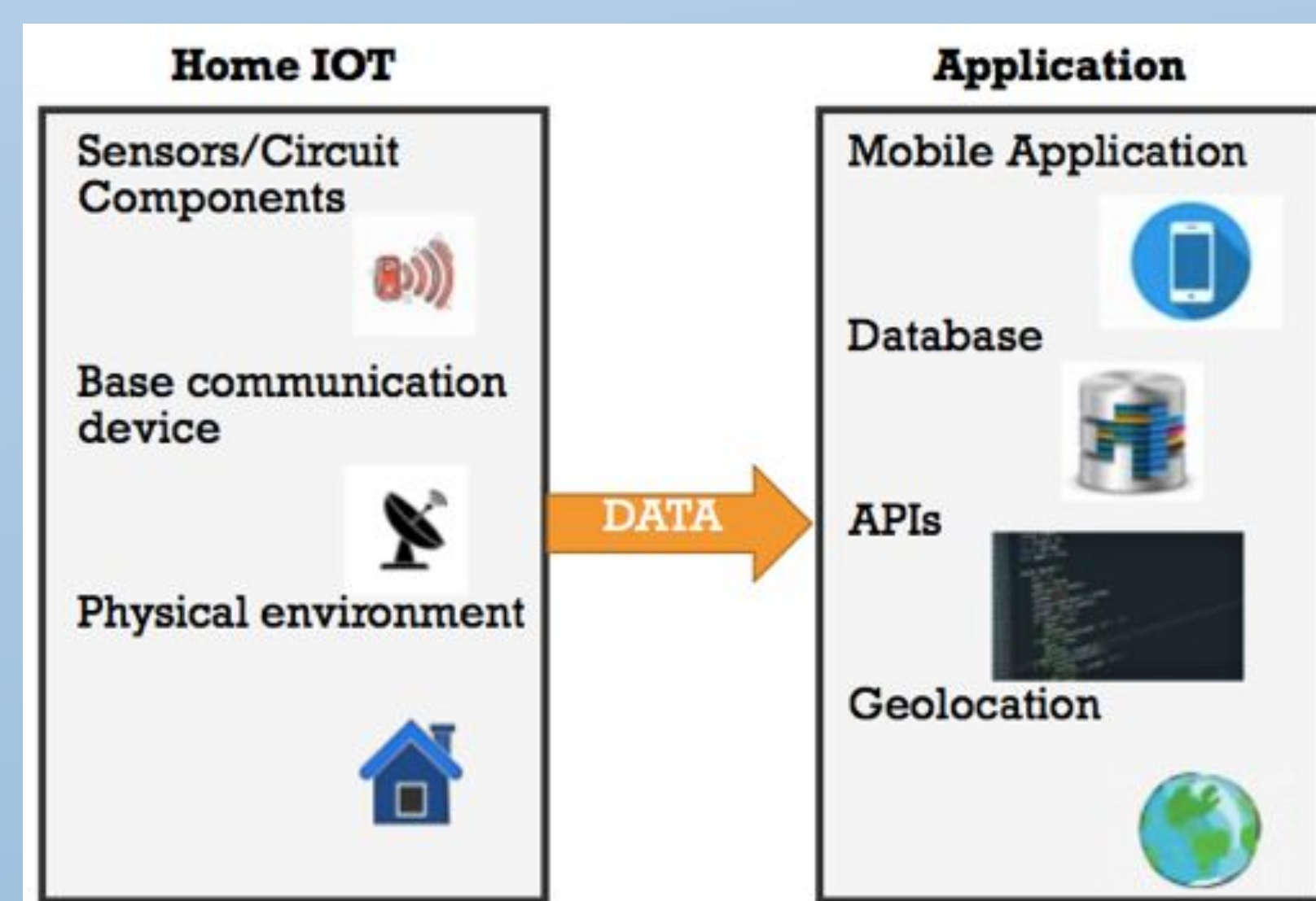
U.S. Online Grocery Survey (2019)



Base: US Internet users ages 18+ who have bought groceries in-store/online in the past 12 months (1,803 in-store and 695 online)
Source: Coresight Research

Goal

- Help users find a balance between in-store and online shopping experiences
- An end-to-end IoT solution that will:
 - Monitor the status of items in a shelf or cabinet
 - Generate a list of items “to buy”
 - Location notification for users that needed items are available at a nearby store
- Automatic update of online orders if user decides to purchase items in store



Engineering Standards and Design Practices

Functional

- Data collection from Pi and barcode scanner
- Data is being transmitted to database from Pi
- Front-end can visualize data from the database

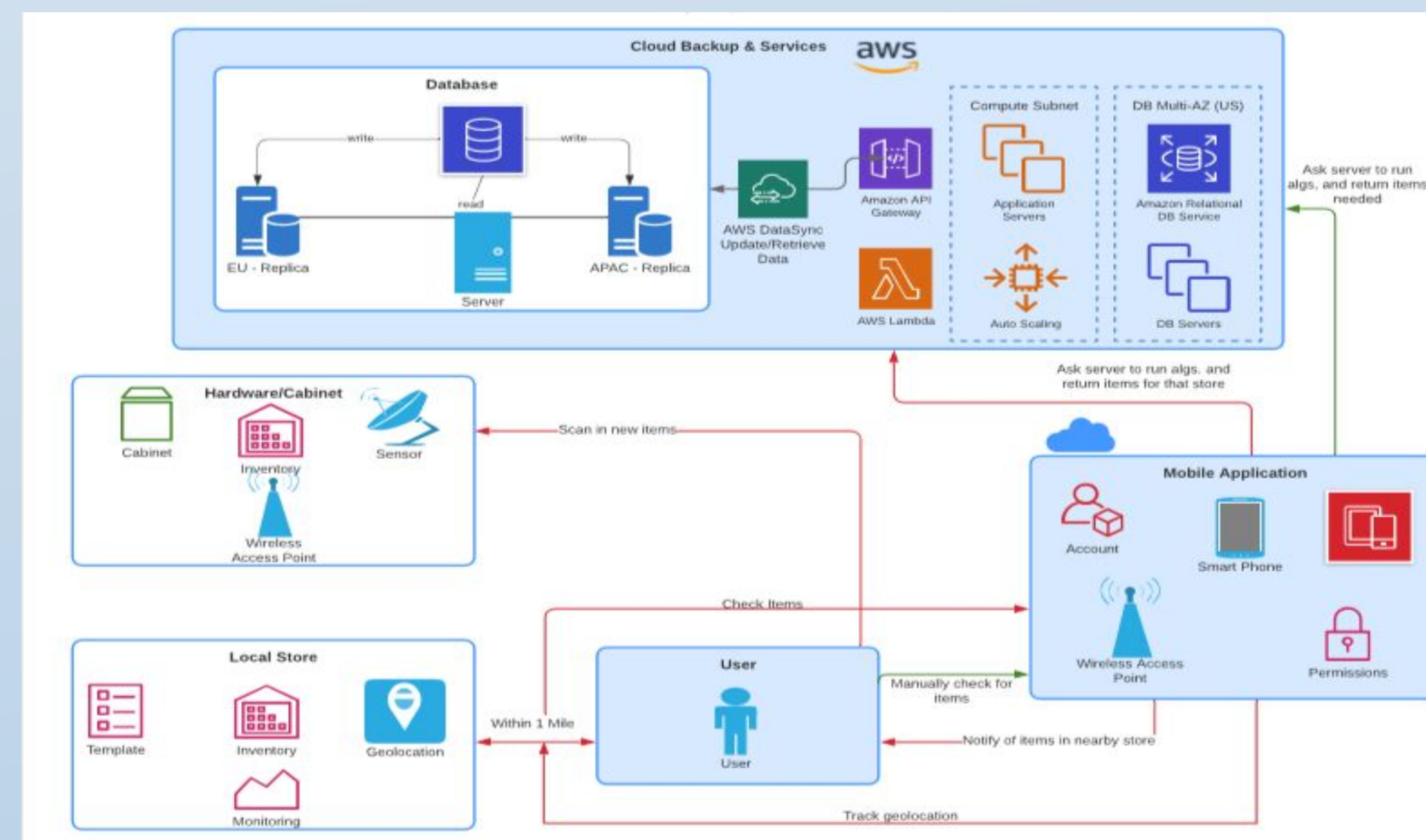
Non-Functional / Constraints

- Scalability
- Data Integrity
- Usability

Most Relevant Standards

- **IEEE 1028-1997** - IEEE Standard for Software Reviews (References, IEEE Standards)
- **IEEE 802.11** - Wi-Fi between ESP8266 and Raspberry Pi
- **IEEE 1532** - In-System Configuration of Programmable Devices

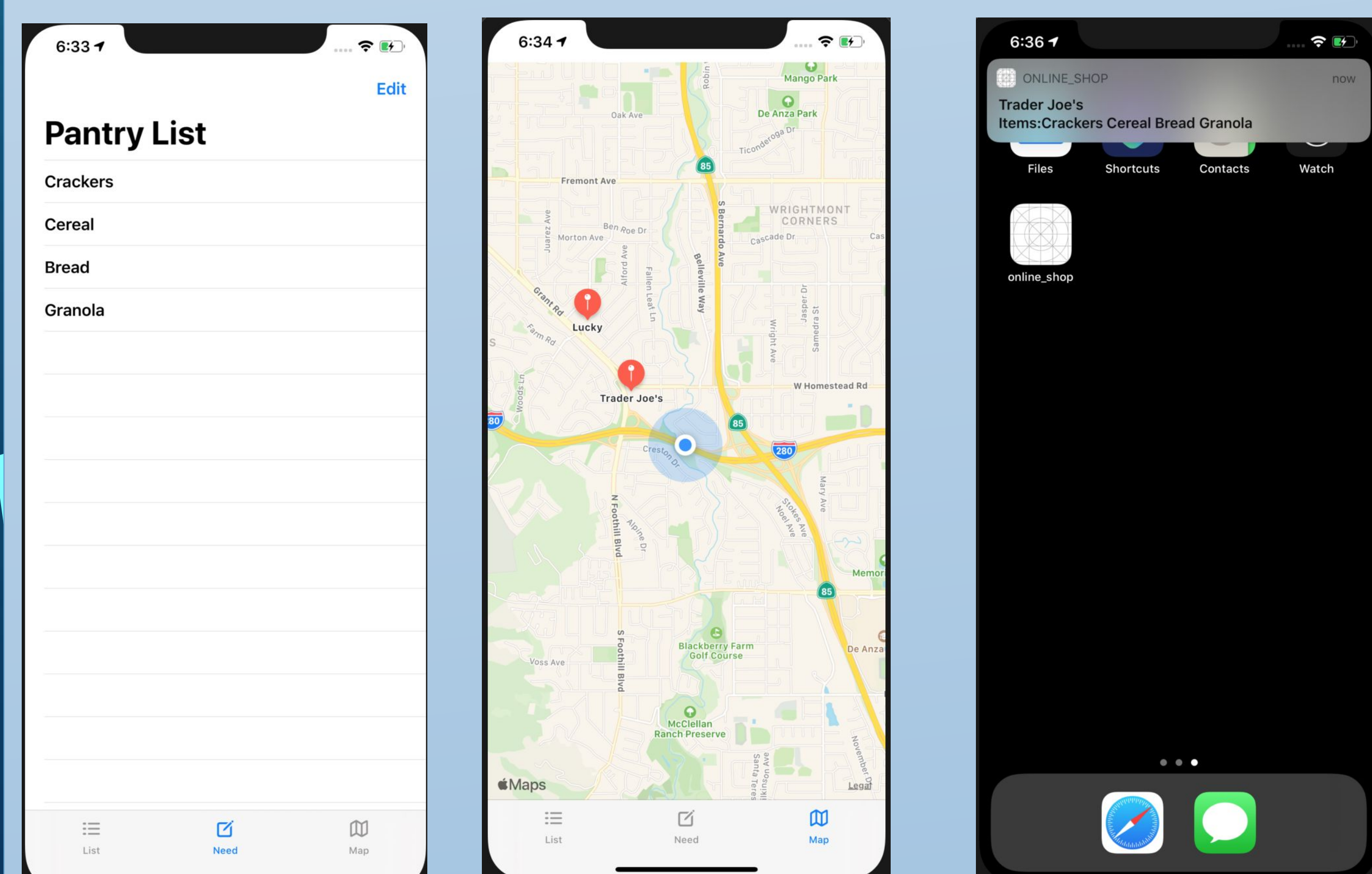
Design Approach



End to End Behavior

- Master- Slave system
 - Master- Raspberry Pi
 - Slave – Barcode Scanner
- Raspberry Pi sends API calls with item information

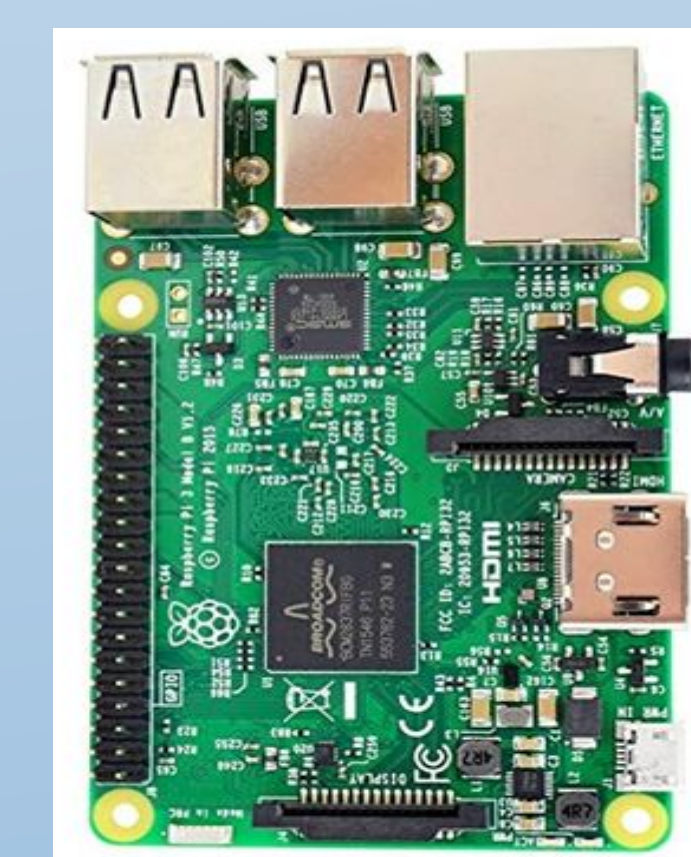
Mobile Application



- Quick pantry monitoring
- Easy access purchase history
- Timely notification system
- Precise geolocation capability
- Customizable pantry list

Technical Requirements

- Raspberry Pi 3 Model B+
- Wired and Wireless Barcode scanner
- Power Supply
- AWS server database



Testing

Hardware

- **Raspberry Pi**
 - Transfers the cataloged pantry items
- **Barcode Scanner**
 - To log the item that has been entered into the pantry

Software

- Stores the items that have entered
- Allows user to see needed items and everything that they have bought
- When near stores algorithm is run to show best priced item