

Multi-Context Shopping Optimization

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Problem

- Too many combinations of shopping possibilities for consumers to make the best decision
- No one store has the lowest prices for every item

Solution

- Sensors placed within a user's home that automatically track grocery item levels
- Mobile app:
 - Track inventory
 - Curate shopping list
 - Deliver shopping suggestions

Users

- Everyday people
- Frugal customers
- Families

Uses

- Simplify grocery shopping
- Save money
- Remember to buy grocery items

Design Requirements

Functional Requirements

- Weight sensors
- Inventory tracking
- Cost-effective routing
- Manual inventory modification

Non-Functional

- Horizontally scalable
- Secure from attacks
- Easy to use UI
- Straightforward sensor setup

Operating Environment

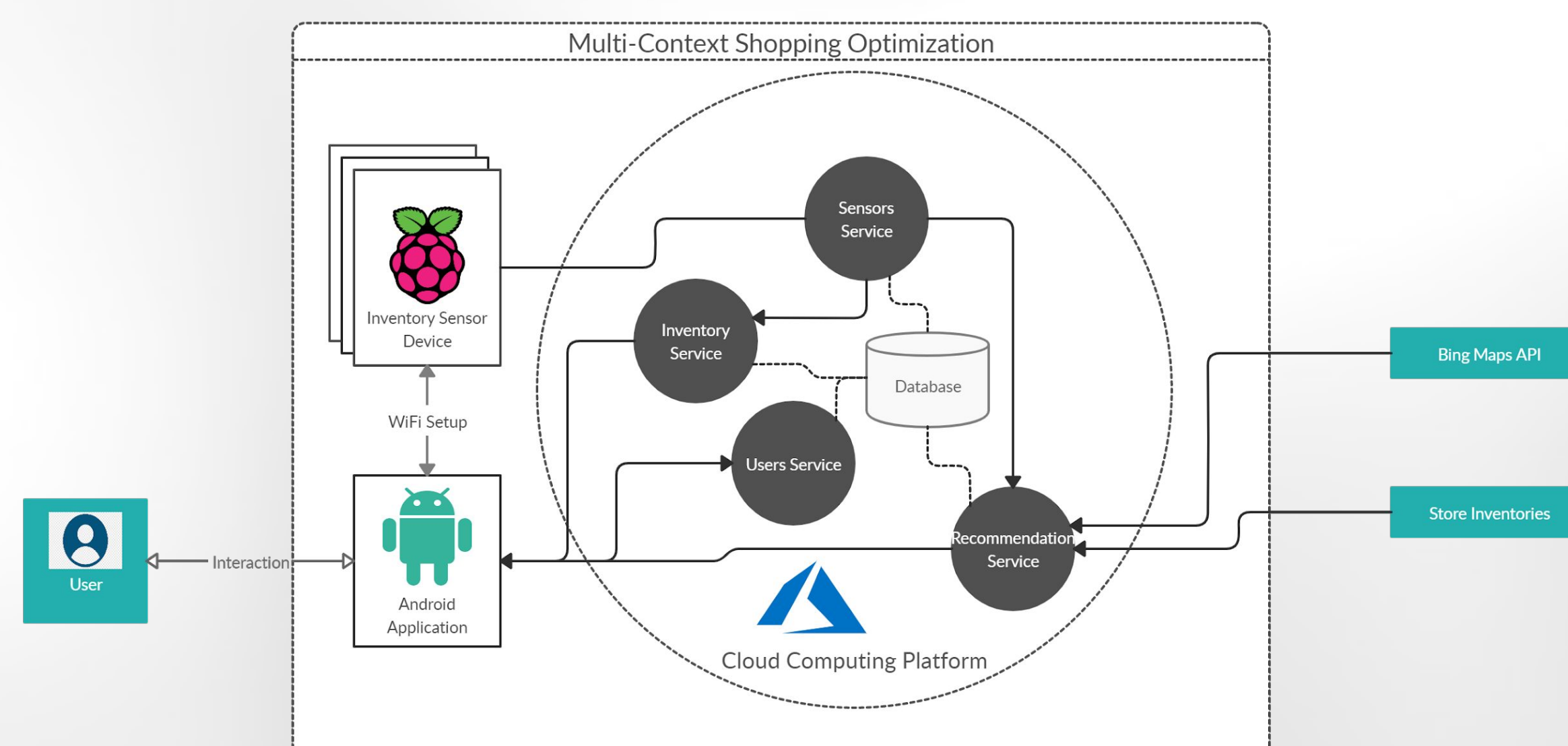
- Android device
 - Microcontroller & weight sensor
 - Cold temperatures
 - Within closed container

Design Approach

Concept Sketch



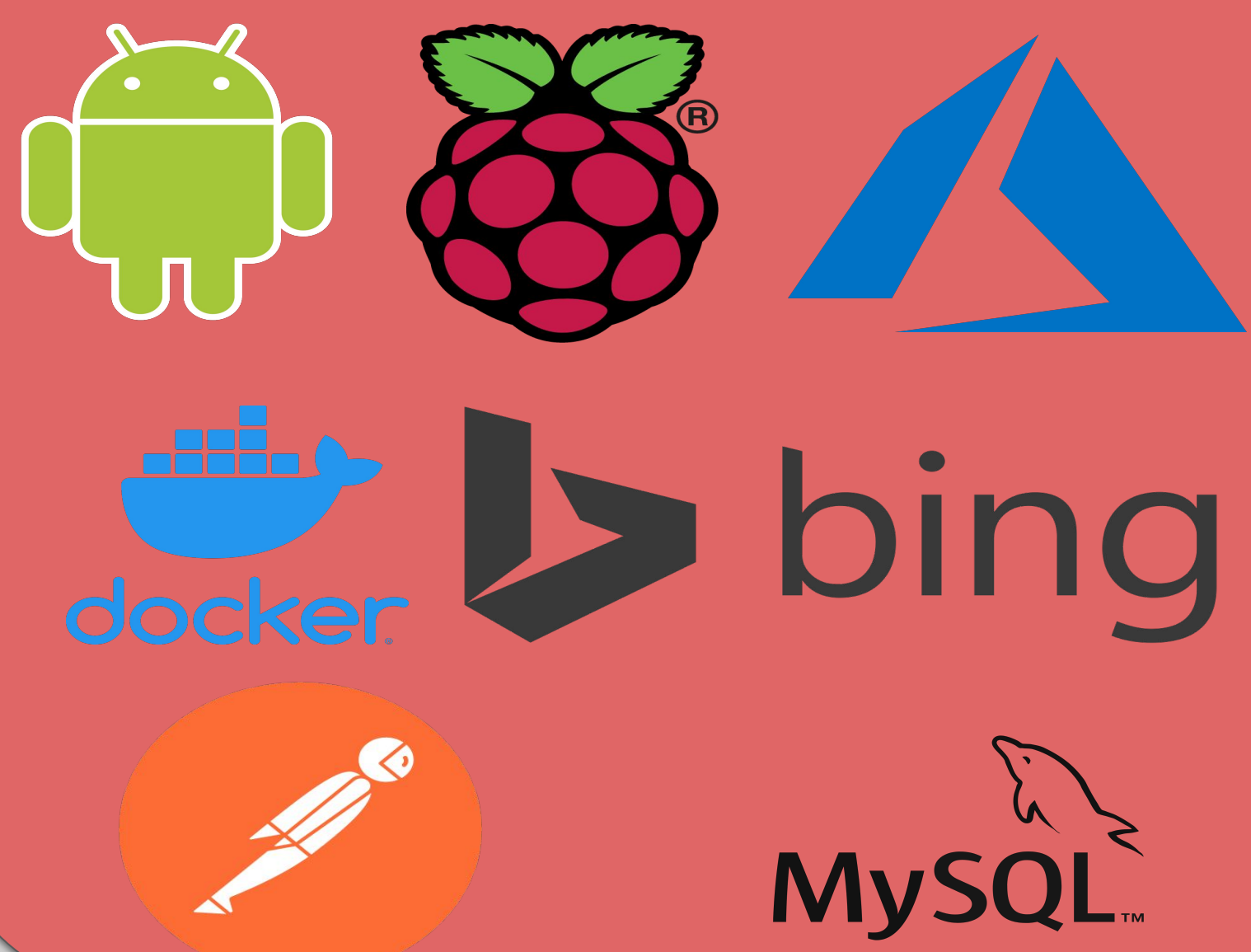
Block Diagram



How it Works

1. User sets up weight sensor(s).
2. Application monitors inventory.
3. An item is added to the shopping list if it's low or runs out.
4. Route a user to grocery stores based upon store location and item prices.

Technology



Languages & Libraries



Development Tools



Testing Environment

- Dockerized containers
- Local Machines
- Microsoft Azure

Engineering Standards & Design Practices

- HTTPS
- gRPC
- IEEE 802.11
- IP and TCP
- Iterative prototyping
- Microservices
- Modular Design
- Object Oriented

Testing Strategy

- Automated functional testing
- Manual user testing
- Unit tests