To Online Shop, Or to Not Online Shop

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Overall Scope

- **Purpose**: Utilize online shopping and at-home experiences to enhance the shopping capabilities of customers.

- **What is it?**: An IOT based solution that combines mobile app development, communication with hardware sensors, and data management.

- **Expected Outcome**: A proof of concept for a single location (ex: cabinet or cupboard) with hopes of expanding to other places in the home.

Technical Challenge

Accounting for objects in the pantry:

We had to decide on the type of sensor to account for inventory of items in the cupboard

The decision came down to between:

- RFID or Barcode?

Sensors

RF ID

- Pros:
    - Very accurate and there is a wealth of repositories for system communication between the sensor and microcontroller
    - One need to be in a range of sensor

- Cons:
    - Placing and removing sensor
    - Higher cost for buying each sticker
    - Giving each sticker a unique identifier

Barcode Scanner

- Pros:
    - Barcodes are already on each item
    - Only need the ID of item for data

- Cons:
    - Items need to be scanned one at a time
    - Require that the scanner maintain a line-of-sight with barcode
    - Possible wear and tear as item is continually used

Decision

To develop a final decision, we constructed a basic use-case and decided on using a barcode scanner to register each item rather than an RFID because to eliminate extra costs, tedious application of stickers to each item, and providing unique identifiers for each sticker.

Beyond this decision, we started to consider more complex scenarios. This included multiples of the same item and identifying when items are almost empty. To alleviate these issues, we added a weight sensor to the system as well.

Other Challenges

- Diagramming all cases from start to end that a user could take in the application.

- Deciding on the hardware that the sensors would talk back to before sending information to the server.

- Determining the cases when a user should be notified to buy an item in person or to have the item be bought online.

- Determining the way to track a user and notify upon a certain action.