

Abstract

- Our goal with this project is to develop a better method of keeping inventory of the items in fridges. This would be done through the simple addition of a Raspberry Pi device that would work in conjunction with sensing devices to keep track of these items.
- The data collected is then displayed to the user's convenience on an android application. The backend for data storage and retrieval is built using AWS and GraphQL.
- We then use this item data and match with an ingredients list on a multitude of different recipes to suggest our users what items they could conjure with their current inventory.

Research Challenges

Hardware Challenges

- Serial interfacing with the Pi (barcode scanner)

Software Challenges

- Learning and Understanding cloud frameworks (AWS) and how to apply to it multiple platforms (Android, Node.js)
- Learning web scraping (html traversing)
- Setting up a new Schema for GraphQL
- Research and applying a recipe search utilizing recipe APIs and retrofit



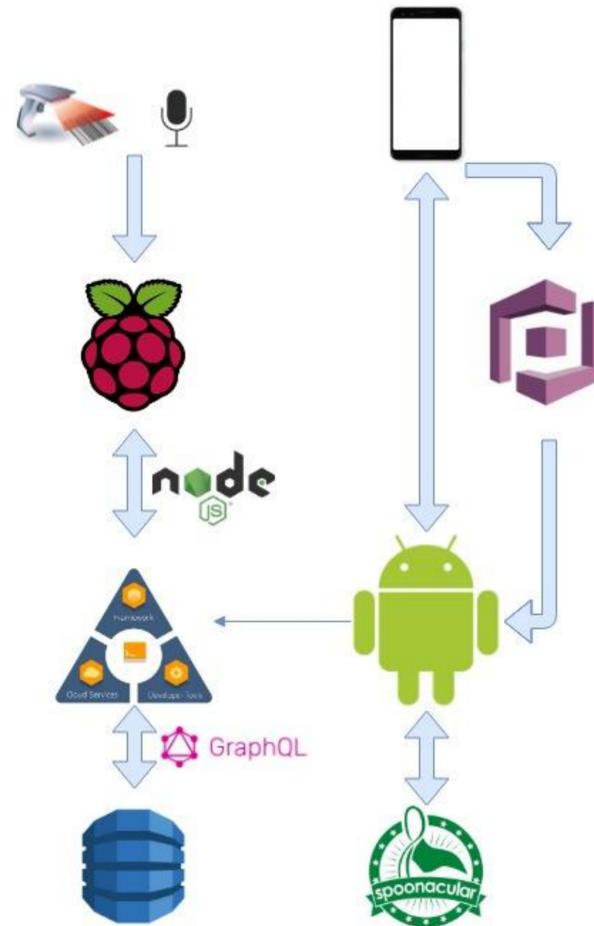
Acknowledgement

We would like to thank our industry partners at Interactions LLC. Our point of contact with them was Dr. John Chen, Ali Dadgar, and Nick Ruiz. All of whom provided support and feedback throughout the project.

References

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- [2] D. S. Dojo, "Intro to Web Scraping with Python and BeautifulSoup," *YouTube*, 06-Jan-2017. [Online]. Available: <https://www.youtube.com/watch?v=XQgXKtPSzUI>. [Accessed: 02-Apr-2019].
- [3] Instructables, "USB Barcode Scanner (Raspberry Pi)," *Instructables*, 27-Jan-2019. [Online]. Available: <https://www.instructables.com/id/USB-Barcode-Scanner-Raspberry-Pi/>. [Accessed: 02-Apr-2019].

Methodology

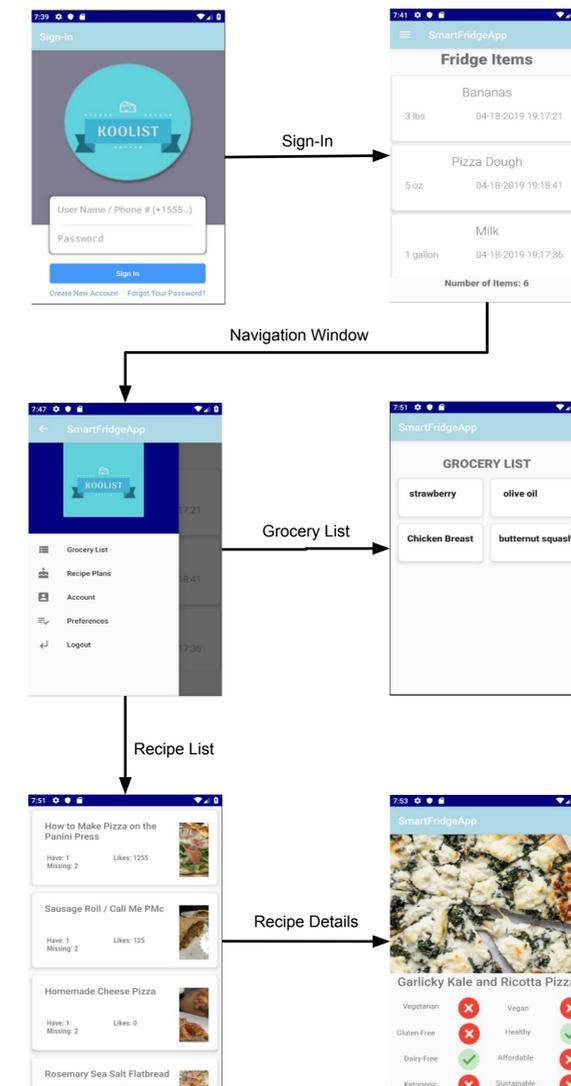


- Two HID's as a point of entry take an individual's input and passes it to the pi
- Raspberry Pi uses a Node.js connection to send item to the AppSync Client
- AppSync Client stores item in DynamoDB
- User starts application and is authorized through Amazon Cognito
- Application automatically generates recipes based on item list (Spoonacular API)

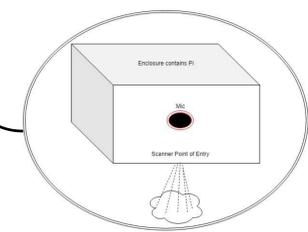
Future Work

- Use Natural Language Processing
- Image Processing and OpenCV for food recognition
- Store Receipt processing for easier list making
- Reduce latency
- Seamless and modular physical enclosure

Results



- Flow Chart of Android screens that demonstrates a typical use case for users
- Starts with user sign in
- First Screen after sign in is main foods list
- Slidable navigation bar shows various tools available to user
- One option is to see the generated grocery list
- Another option is to see list of relevant recipes



- Our desire is to enclose these components in a small physical enclosure atop the fridge where it can be mounted.
- We have mocked this using OSB.