

Abstract

- Our Capstone project presents an innovative solution, a revamped Calgary Co-Op Handheld Scanner App, addressing Co-Op's need for a more reliable inventory management system.
- This initiative integrates item scanning, store signage, expiration logging, and inventory reporting into a single application, specifically designed to target the core issue of app usage in low Wi-Fi zones.
- The solution comprises handheld Android barcode scanners, a React Native mobile app, and a Django Python server-side application. Along with such, by enabling local data storage, our app permits data syncing upon re-establishing a connection, preventing data loss and improving operational efficiency.
- This application enhances operational reliability by ensuring no data is lost during Wifi outages and increases staff productivity by streamlining the inventory management process across all store areas.

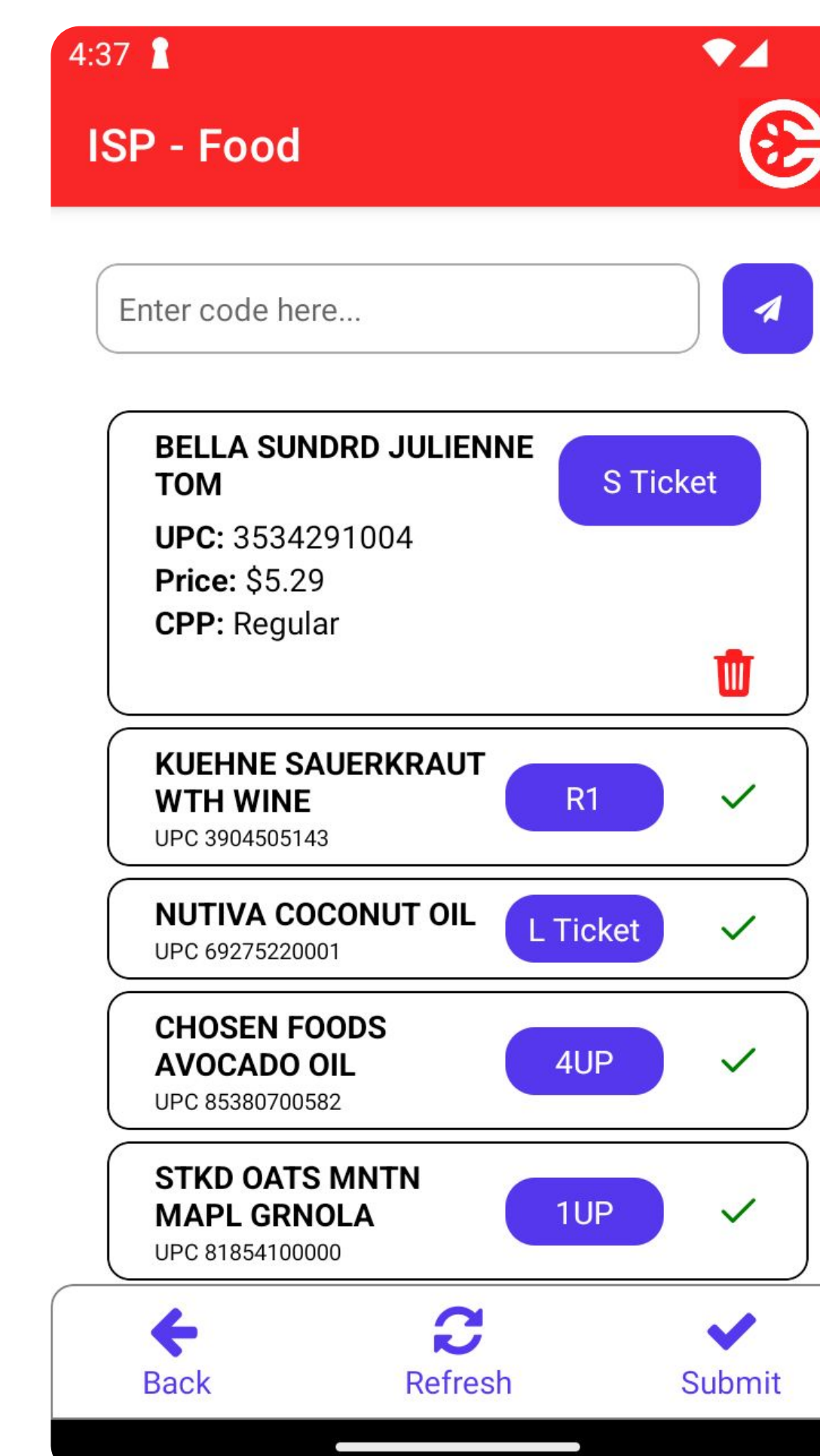
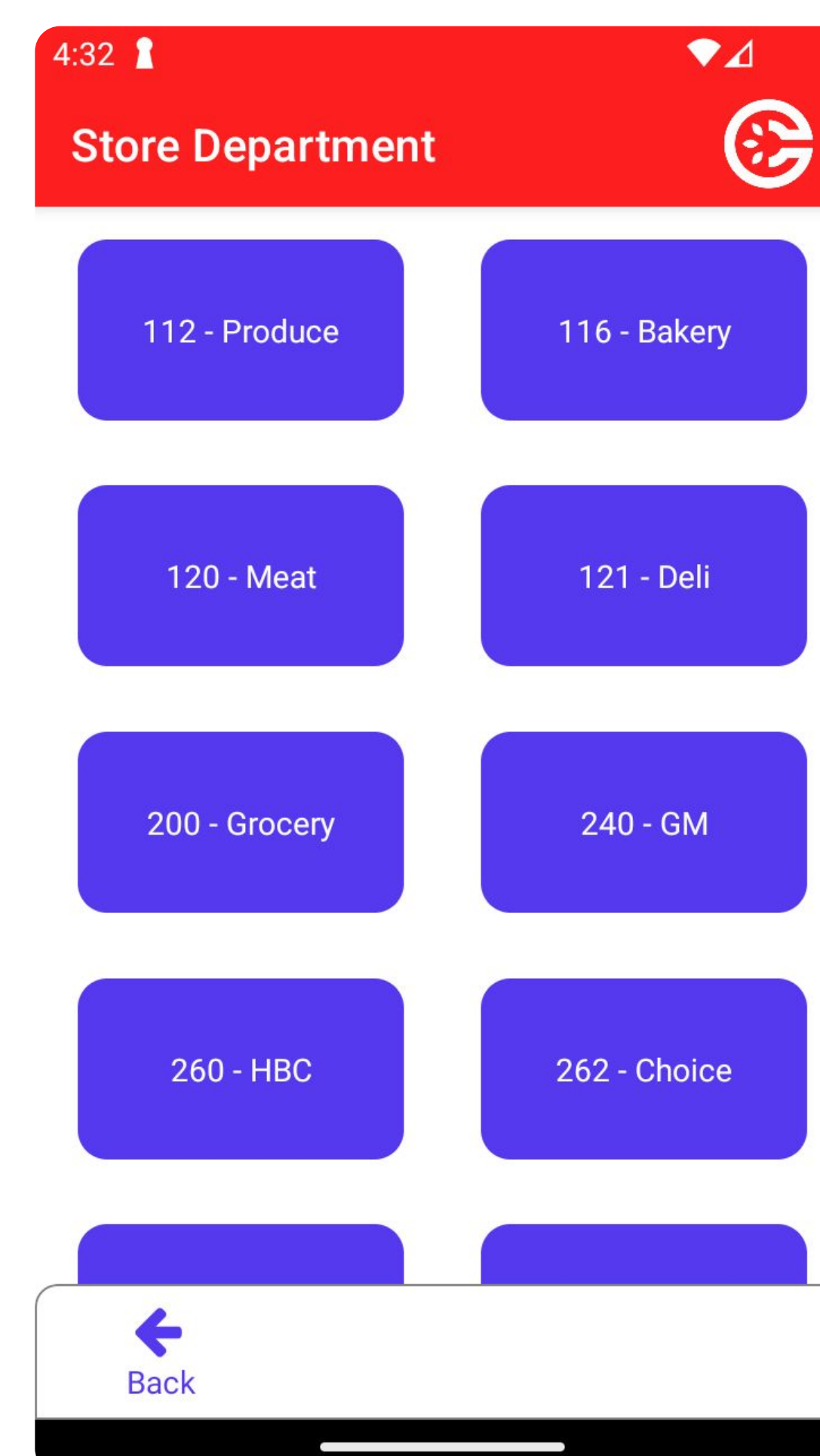
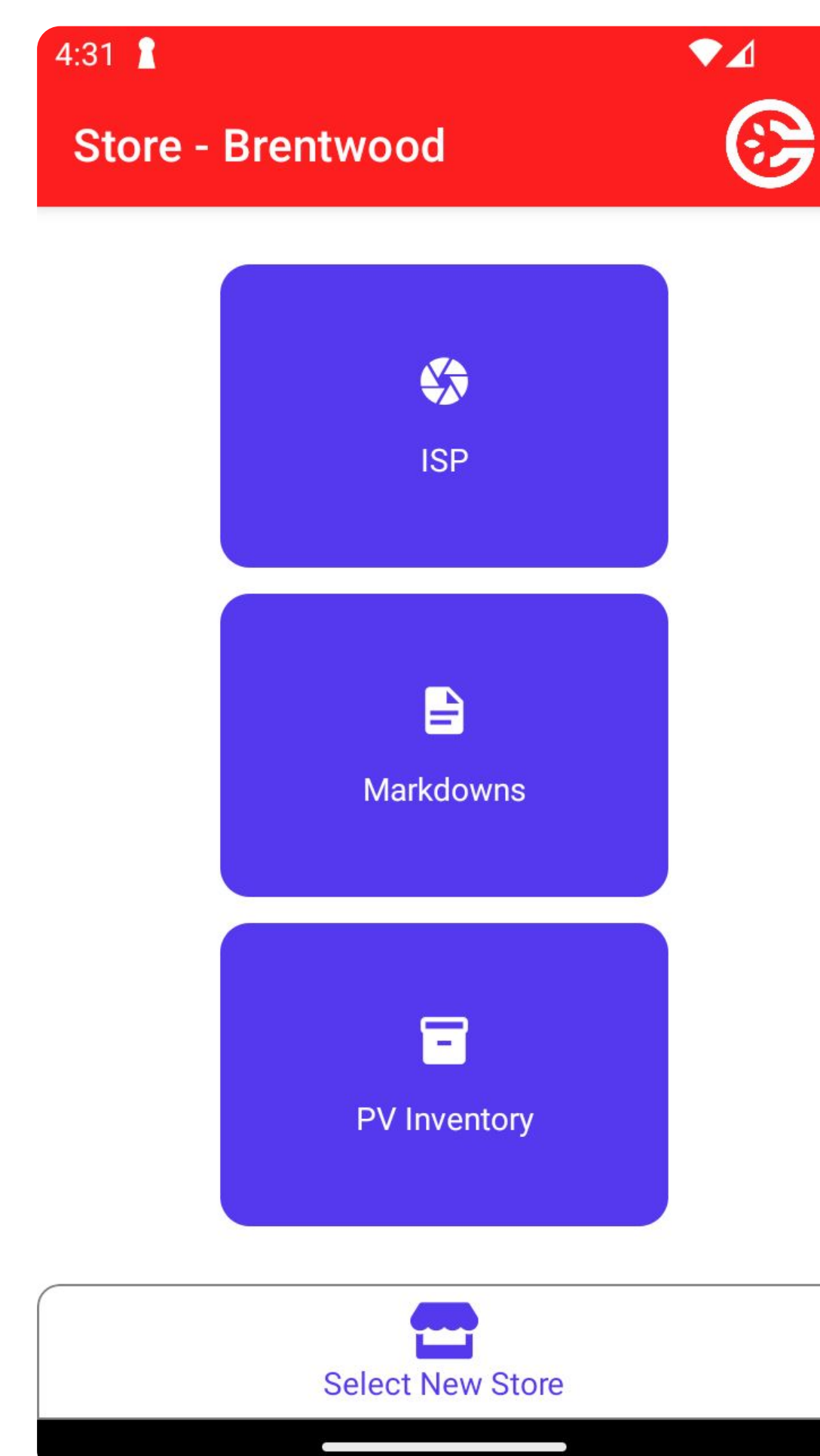
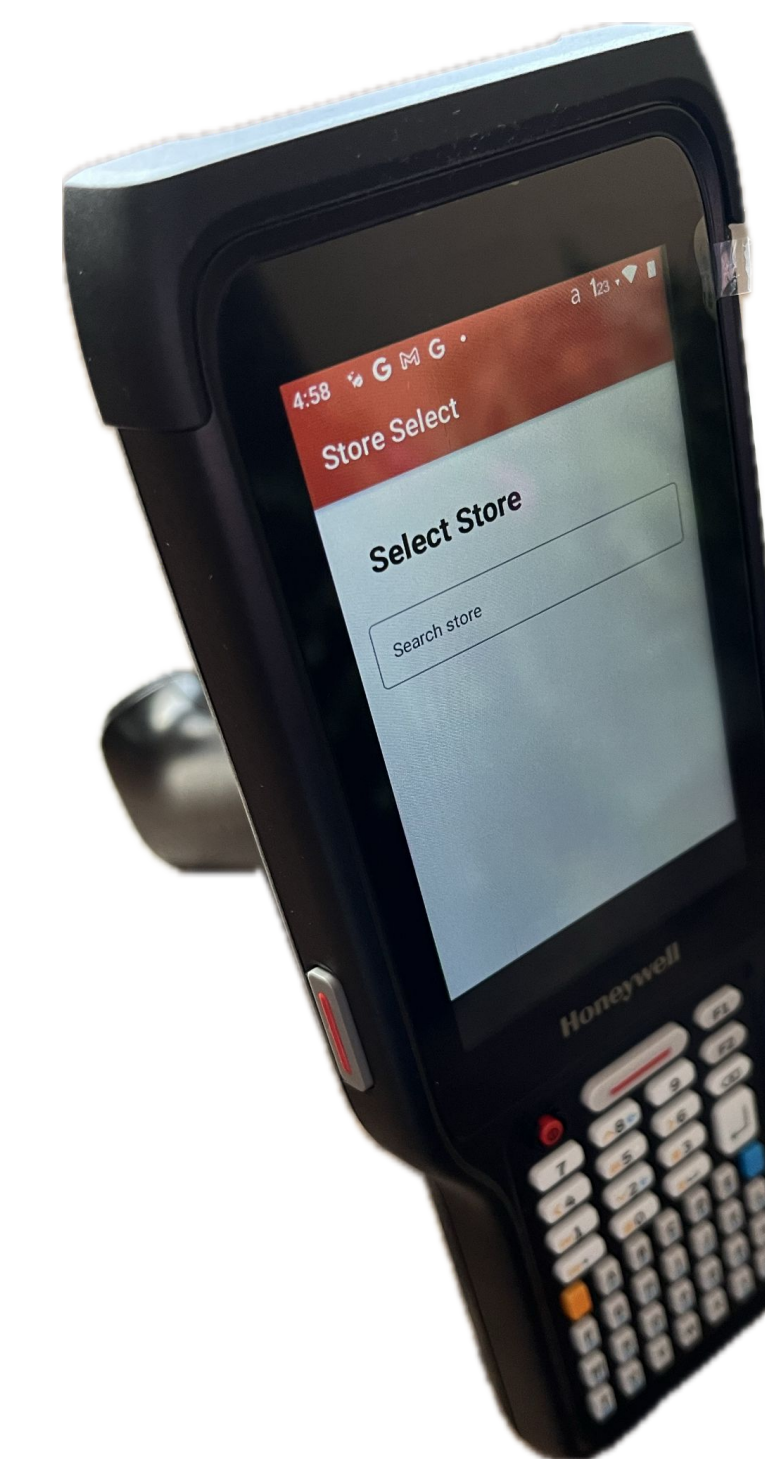
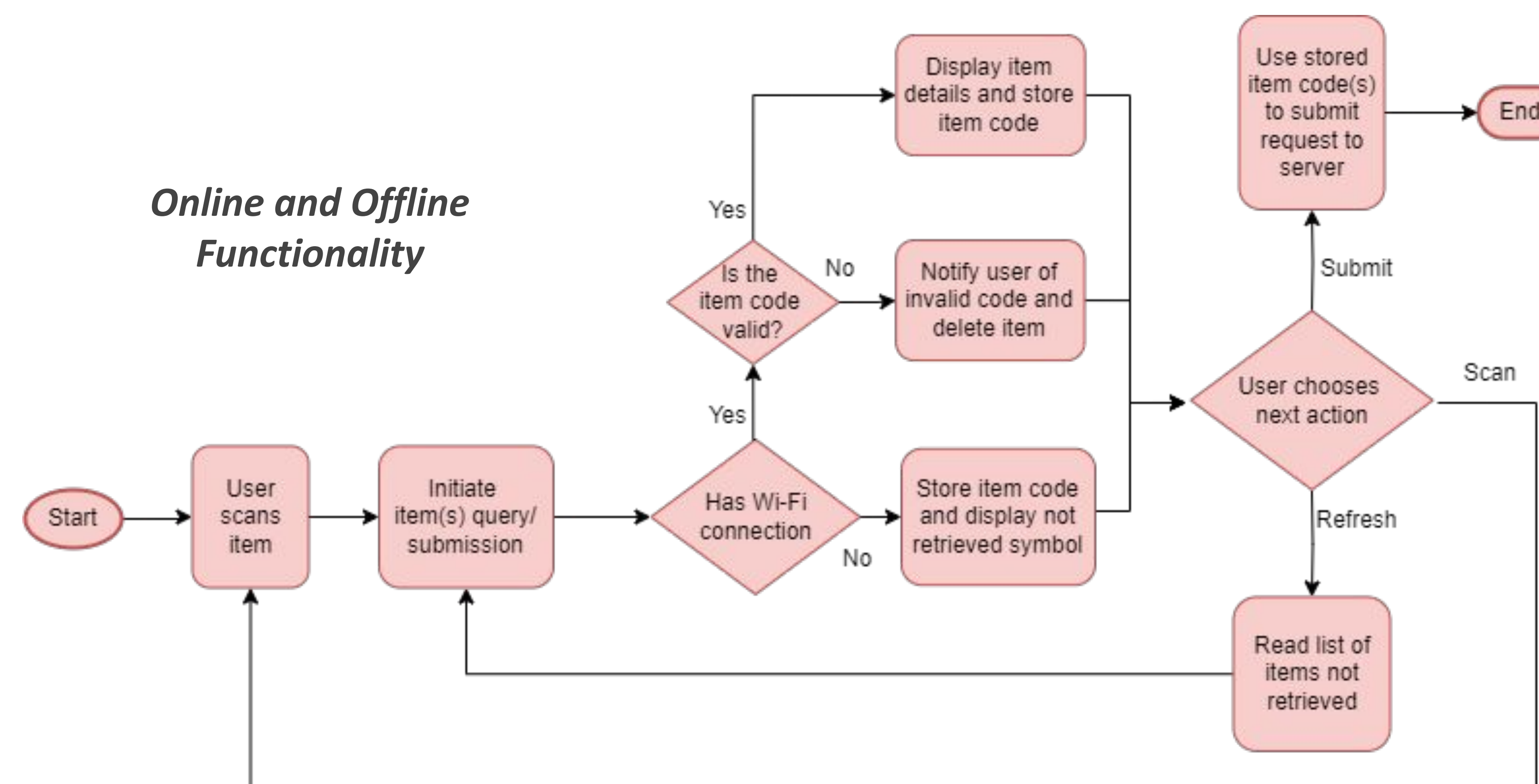
Motivation

- Most Calgary Co-op stores currently grapple with an outdated system for scanning items and managing tasks like inventory recording, signage creation, product expiration tracking, and price checking.
- The system relies on a telnet connection between handheld devices and servers, which frequently fails in areas with poor internet coverage, like freezers and wi-fi dead zones within stores.
- This results in data loss without warning, causing frustration and delays for staff. To address these issues, Calgary Co-op seeks to modernize its system.

Methods and Materials

- **Handheld Android Barcode Scanner Devices**
The main physical user interface, allowing the user to scan items with its built-in scanner and select options from our mobile application. Older models feature a physical keypad, while the newer models allow for the use of their touch display. Both forms of input are fully supported by application.
- **React Native Mobile Application**
A brand new React Native application developed by our team, downloaded on each Handheld Android Scanner Device. This app functions both online and offline, enabling user interaction even in dead store zones with low WiFi connections.
- **Django Python Server-Side Application**
A new application our team has developed to run on a backend Co-Op server, serving data to the React Native Mobile Application via robust REST API, ready to answer to any database queries the mobile app may have.

Solution



Results

- **Mentor and Advisor**
 - Received valuable insights on addressing dead zones and ensuring robust logic for offline functionality.
 - Advisor emphasized thorough verification of key aspects, including technical implementation and documentation.
 - Encouraged to refine strategies for handling dead zones and ensuring seamless user experience.
 - Reviewed important documents with the advisor, incorporating feedback and ensuring accuracy.
- **Store Staff and Sponsor**
 - Positive feedback on app UI/UX, with suggestions for enhancing visibility and user interaction.
 - Successful testing of basic functionalities, but identified missing features and opportunities for offline functionality improvements.
 - Navigation issues noted on smaller screens, along with technical adjustments and branding suggestions.

Discussion

- Our main challenge during development was implementing an efficient and reliable way to keep the application functional while offline.
 - This was accomplished by storing batches locally on the device, allowing the user to wait until a connection is established to submit data.
- While some elements of our interface changed from our initial plan to improve the user experience, the core functionality of our application did not.
- One future application of our system could be the ability for multiple users to synchronously work on the same batch at the same time.
 - This would involve not only relaying information between the handheld and the server, but between handhelds, using the server as a mediator.

Conclusion

- Our Revamped Calgary Co-op app now operates with online and offline functionality, fulfilling our sponsors' requirements.
- Enhanced the original inventory management system through modern coding practices and comprehensive documentation.
- Acquired valuable experience in crafting a React application and designing a REST API, guided by insights from stakeholders.