

Project Plan Presentation

Intelligent Recognition Inventory System

The Capstone Experience

Team Whirlpool

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From Students...
...to Professionals

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Project Sponsor Overview

- Leading manufacturer and marketer of home appliances for 112 years
- Own several home related brands
- Constantly improving home life
- Advanced Development Technology (R&D)



Project Functional Specifications

- Wasted food, extra spending, meal planning stress
- Up-to-date digital inventory of everything in the fridge
- Automatic detection & tracking of products being loaded and unloaded
- Smart, effortless organization helps households save money, cut waste, plan meals

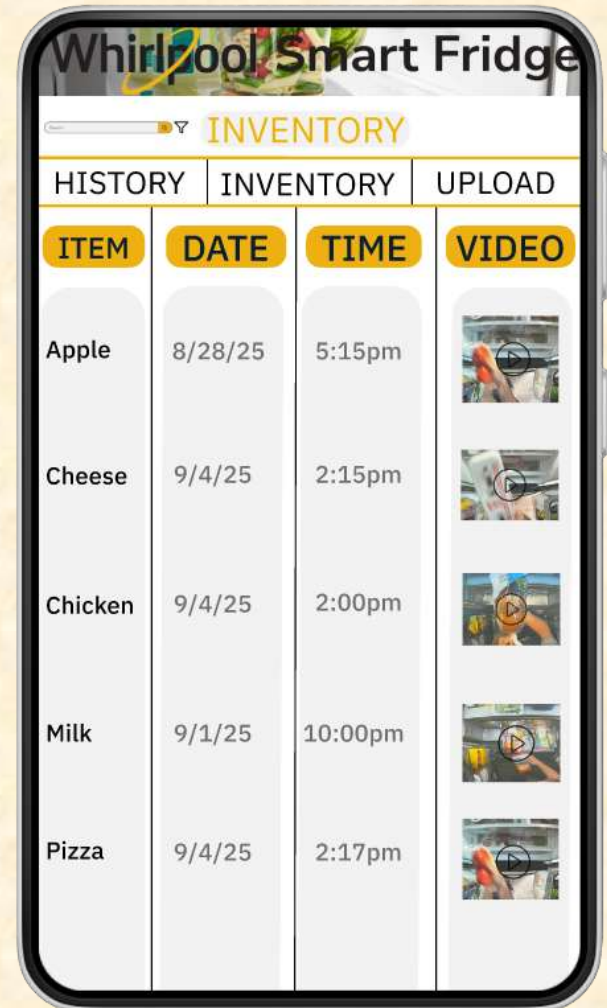


Project Design Specifications

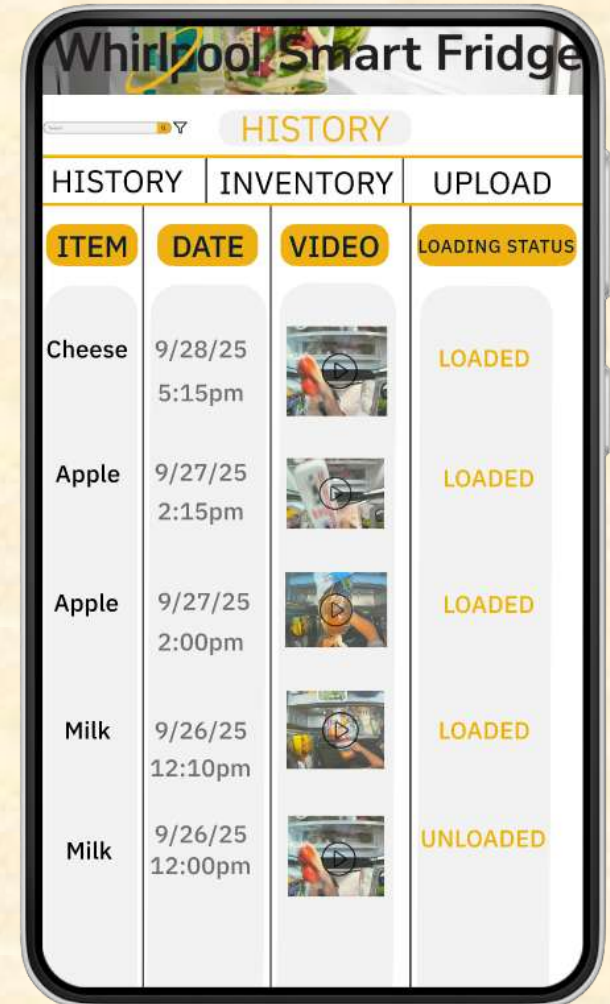
- 3 main tabs: Inventory, History, Upload
- Inventory: What's currently in the fridge?
- History: Timeline of all loading and unloading events
- Upload: Lets the user manually add items if not detected automatically
- Edit, search, and filter capabilities
- Consistent branding/UI design between web and mobile



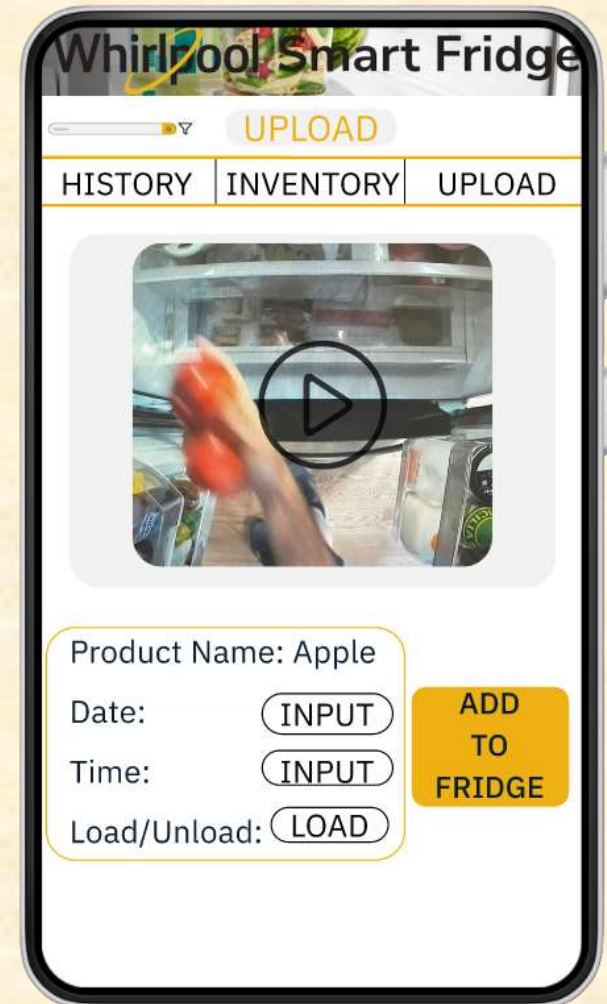
Screen Mockup: Inventory Page



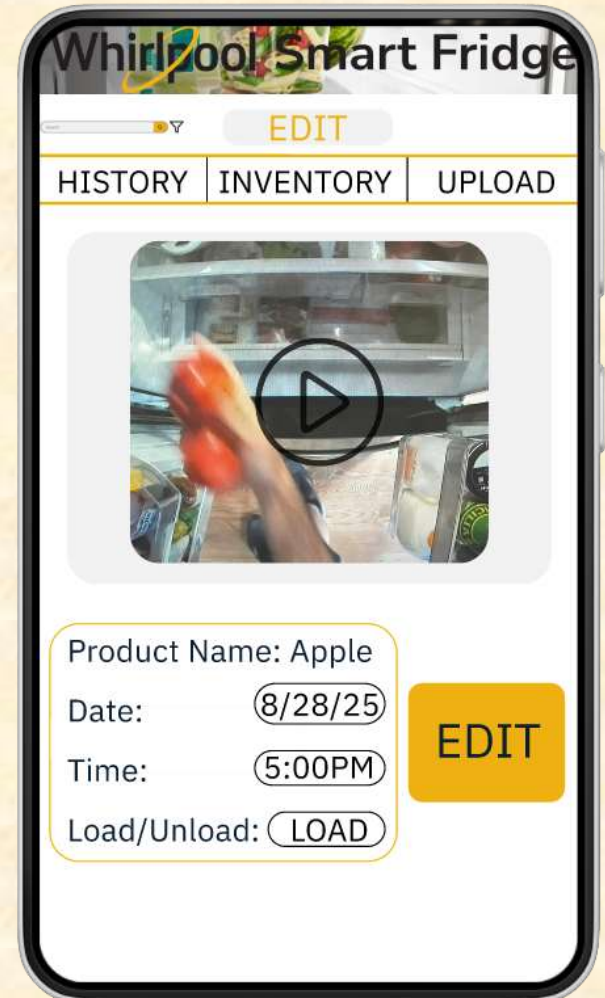
Screen Mockup: History Page



Screen Mockup: Upload Page



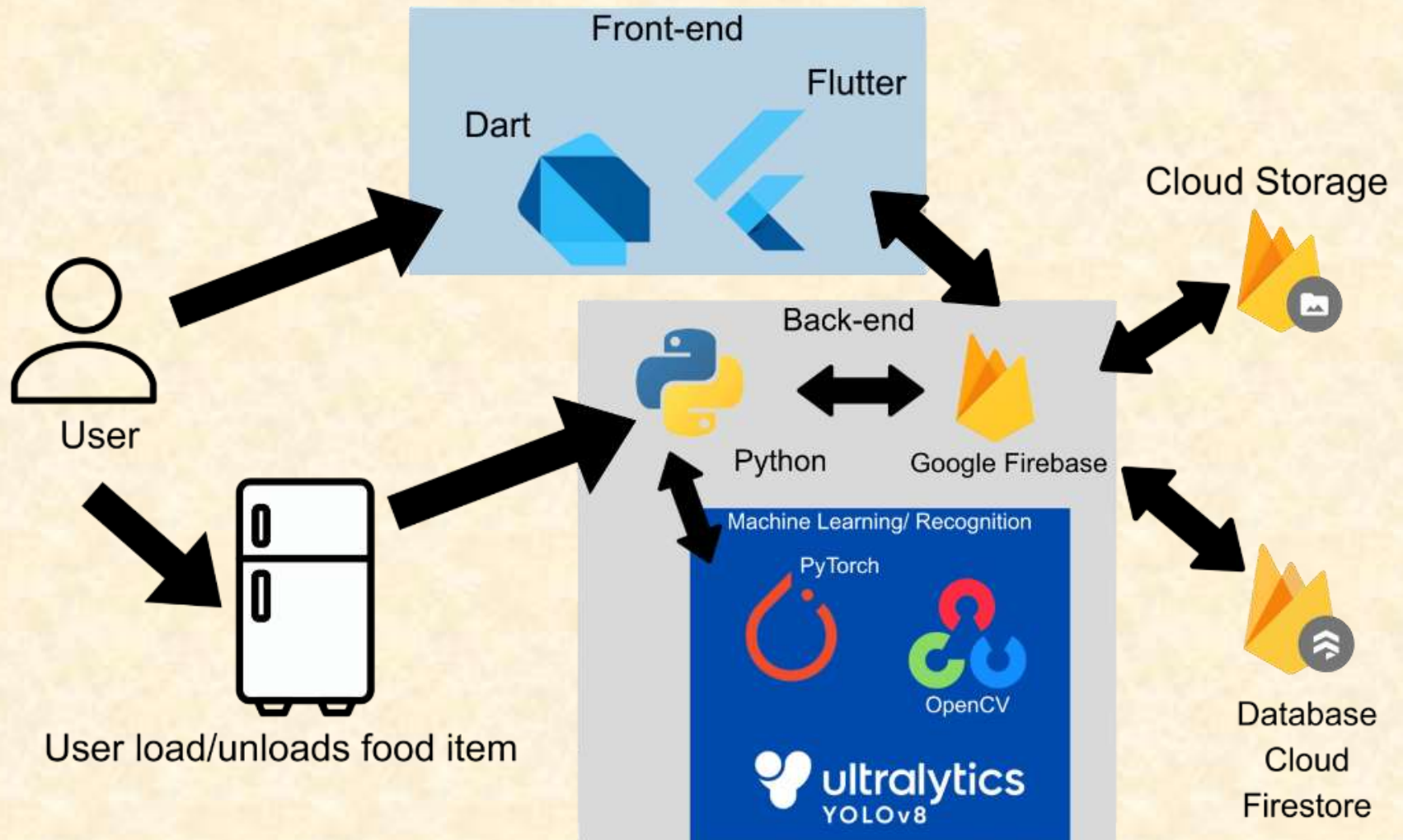
Screen Mockup: Edit Page



Project Technical Specifications

- Front-end: Flutter, Dart
- Back-end: Python, Google Firebase
- Machine Learning Recognition: Ultralytics, YOLOv8 (Object Detection Model), Pytorch, OpenCV (Open Computer-Vision)
- Database and Storage: Google Firebase

Project System Architecture



Project System Components

- Hardware Platforms
 - Camera – from Whirlpool
- Software Platforms / Technologies
 - Google Firebase
 - Cloud Storage
 - Cloud Firestore
 - Pycharm
 - OpenCV, Ultralytics, PyTorch
 - Flutter/Dart
 - Android Studio
 - XCode



Project Risks

- Video/Image Conditions
 - Adaptability for camera angles
 - Building large datasets
- Product Appearance Variance
 - Classification of similar but different products
 - High classification to refined specifics
- Security of Data and Software
 - Effective security and privacy of data and software
 - Complex encryption strategies and video edits
- Algorithm Runtime
 - Efficiency to keep up with live feed and multiple objects
 - Real time databases, batching & frame skipping



Questions?

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