AI/ML Inventory Detection

RECORDING INVENTORY AUTOMATICALLY FOR HISTORICAL ANALYSIS

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Background

- What food is in my refrigerator?
- Want a way to automatically detect what is in their storage & view historical trends of inventory over time
- Use historical trends to conduct inventory analysis

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Project Overview

Objective and Key Results (OKRs)

1. Provide a platform to automatically record down inventory for countable items (fruits).
2. Provide an interface to view the historical trends.

Key Performance Indicators (KPIs)

1. Record inventory stock within seconds.
2. Provide a web platform to view historical data entries.

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Storyboard

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Recording Inventory Data

Users authenticate through the web platform & generate a snapshot of the inventory.

The snapshot asset is saved in Amazon S3 storage.

The snapshot is processed and detects the count of unique items using Amazon Rekognition.

The count of objects and image location is recorded into Amazon Timestream.

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Viewing Historical Inventory

Users authenticate through the web platform & view the inventory.

Historical inventory with timestamps is retrieved from storage.

Clicking on any point retrieves the associated image and data entry from Amazon S3

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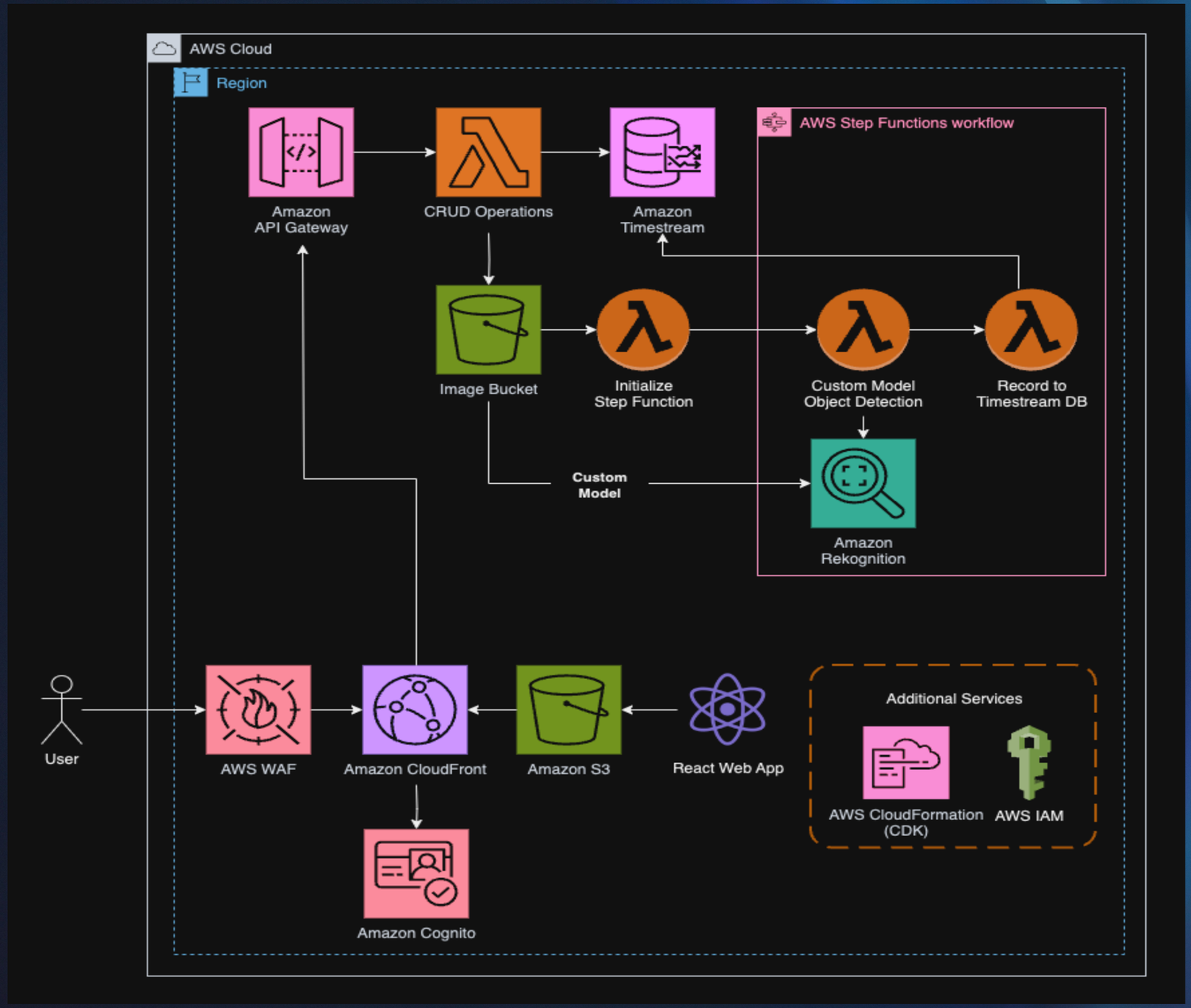
Architecture Diagram



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Demo

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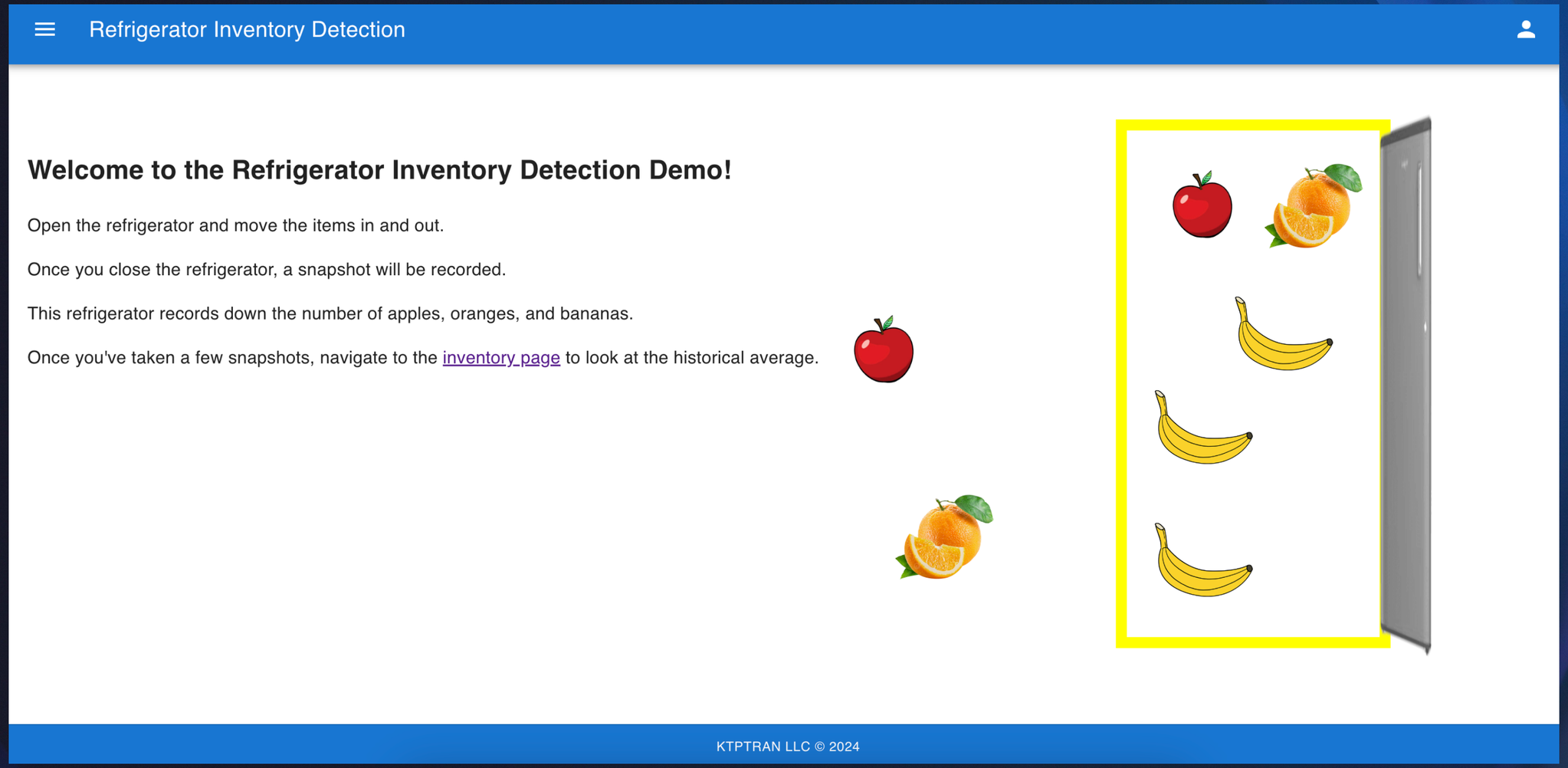
Recording Inventory

AFTER LOGGING INTO THE SYSTEM, OPEN THE REFRIGERATOR AND MOVE AROUND THE FRUITS. ONCE YOU CLOSE THE FRIDGE, A SNAPSHOT WILL BE SAVED AND ANALYZED TO RECORD.



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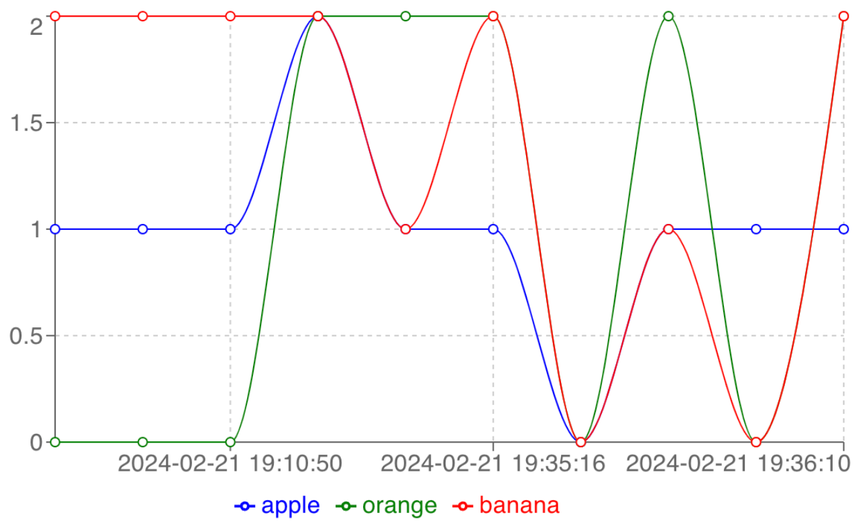
Inventory Historical View

WITH A FEW ENTRIES, NAVIGATE TO THE INVENTORY PAGE THROUGH THE SIDEBAR. HERE YOU CAN VIEW THE INVENTORY AT ANY SPECIFIC TIME AND RETRIEVE ITS ASSOCIATED IMAGE.

Refrigerator Inventory Detection

Inventory

Selecting a bubble on the graph at a specific timeframe will update both the table and photo with the details at that time.



2024-02-21 19:35:49

REFRESH

Fruit	Count
Banana	1
Apple	1
Orange	2

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Future State

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Platform Expenses

Web Hosting Platform

- AWS WAF
- Amazon CloudFront
- Amazon S3

Backend Processing

- Amazon Cognito
- Amazon API Gateway
- Amazon Rekognition
- AWS Lambda
- Amazon Timestream

User Data

- Inventory detection model data
- Snapshot image asset storage
- Inventory record storage

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Additional Features

- **Amazon Rekognition Model accuracy:** scaling images to tens of thousands
- **IoT Ingestion:** Utilizing IoT devices such as cameras to generate snapshots of real-life inventory
- **AI/ML Inventory Prediction:** Using Amazon Forecast to forecast predictions of inventory to prevent cases of not having items in inventory.

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Thank you!

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