AI/ML Inventory Detection

RECORDING INVENTORY AUTOMATICALLY USING AI/ML FOR HISTORICAL ANALYSIS

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Table of Contents

Project Overview

Objective and Key Results (OKRs)

1. Provide a platform to automatically record down item inventory.
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 configuration and historical trends

Storyboard

User Generating 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 analyzes the count of objects using Amazon Rekognition.

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

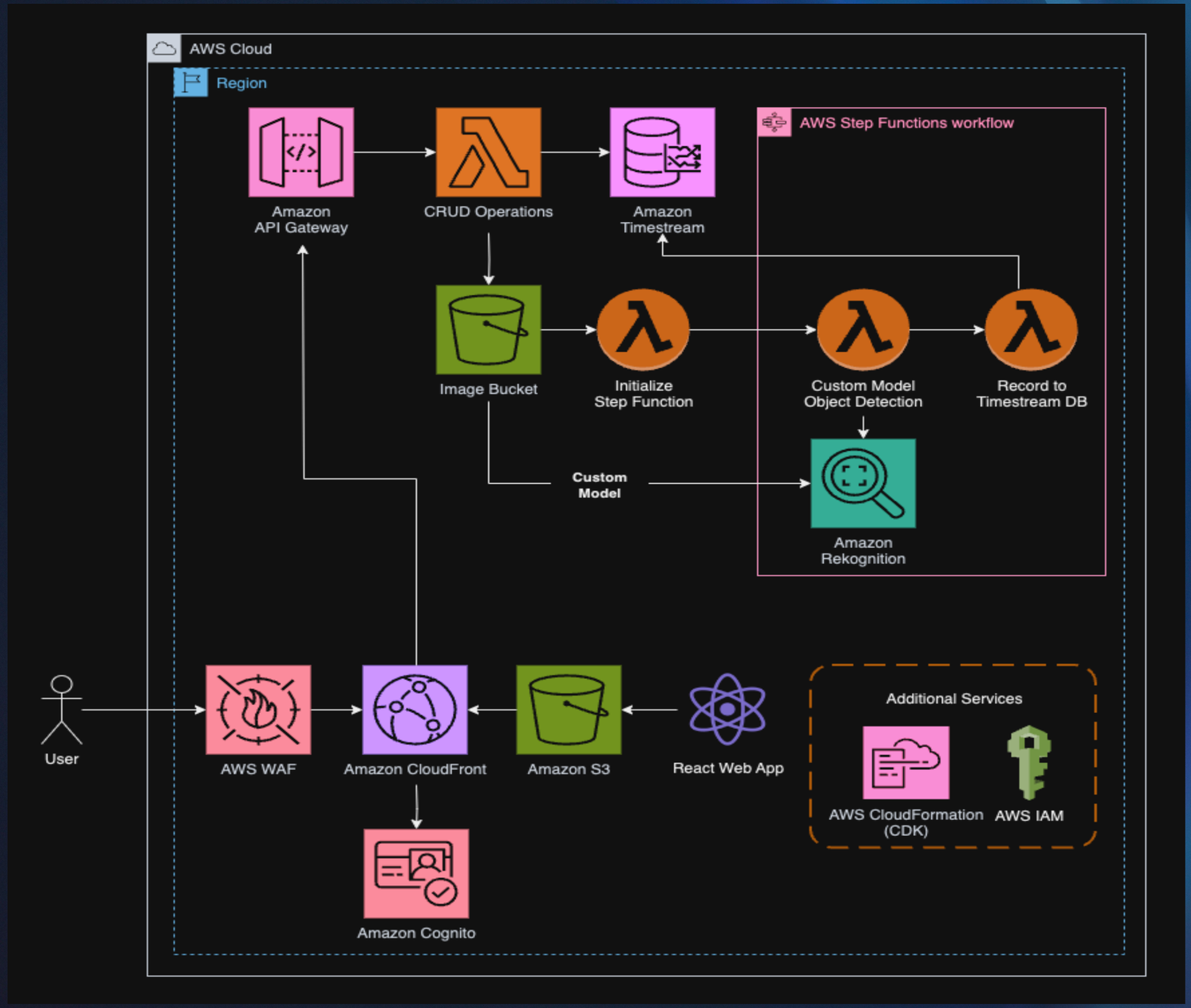
Viewing Historical Inventory

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 from Amazon S3.

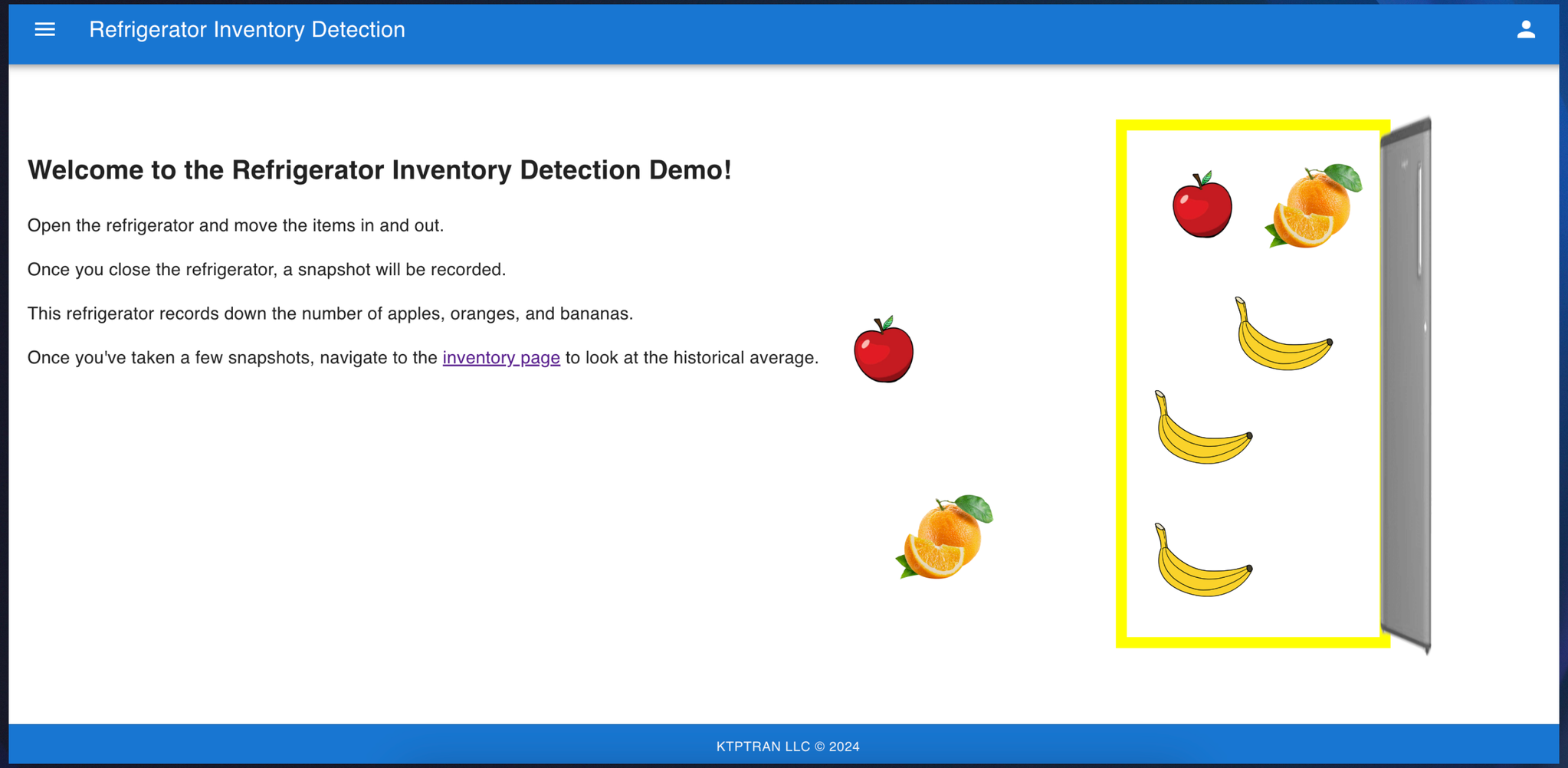
Architecture Diagram



Demo

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.



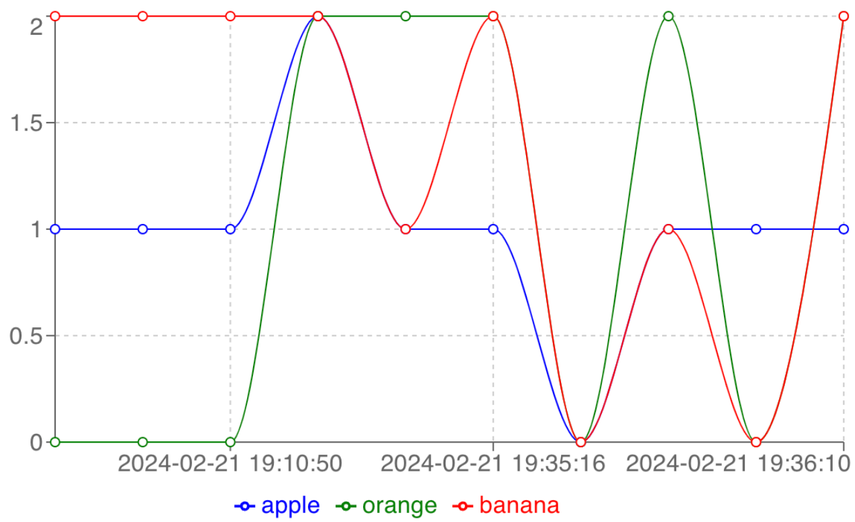
Inventory Historical View

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

Project Timeline

Sprint 1
(2/13-2/23)

1. Web interface platform
2. User authentication
3. Snapshot workflow

Sprint 2
(2/26-3/8)

1. Amazon Rekognition Model training
2. Inventory count workflow
3. Historical view page

Sprint 3
(3/11-3/22)

1. Web interface security
2. Point-in-time retrieval of historical snapshot
3. Project assets

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

Additional Features

- **AWS Rekognition model accuracy:** scaling images to tens of thousands to increase model accuracy
- **IoT Ingestion:** Utilizing IoT devices such as cameras to automatically generate snapshots of real-life inventory
- **AI/ML Inventory Prediction:** Using historical data conduct data analytics for predicting the inventory of fruits using Amazon Forecast.

Thank you!

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