



# Fraud Detection ML Ops API for Insurance Claims

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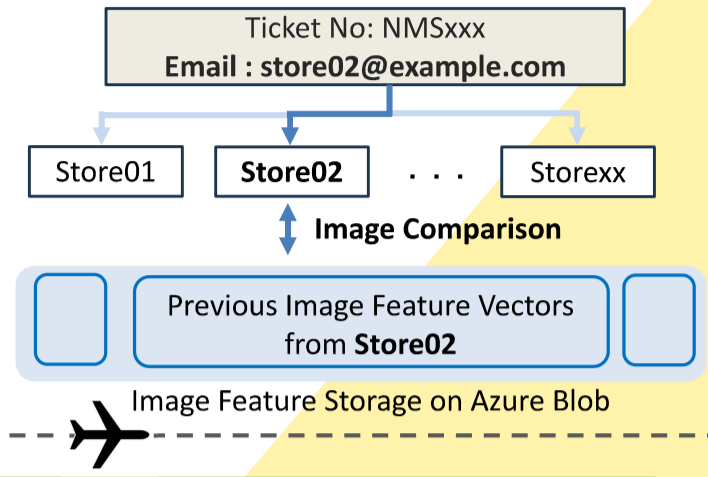
## Business Background

**Objective:**  
Finding possible fraudulent claims that reuse the same or similar (preprocessed) product images as previous claims.

**Story:**  
Our business handles around 20 daily furniture insurance claims and faces recurring fraudulent claims involving identical or manipulated images. Detecting these can prevent significant financial losses, but manually comparing 45,000 images across 15,000 claims from the last two years is not feasible.



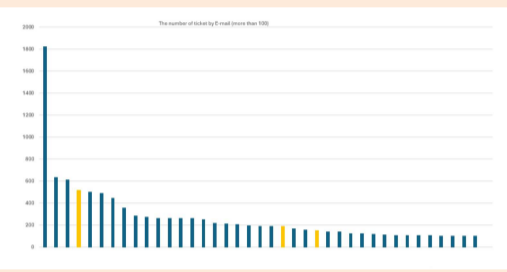
## Key Solution Idea



## Development Process

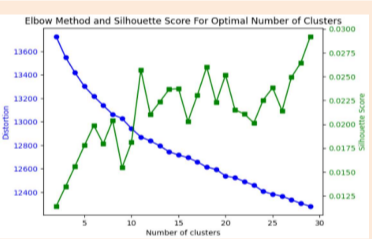
### Data Mining

#### Data Bucketization



Bucketed data based on EDA and compare images within each bucket to improve computational efficiency

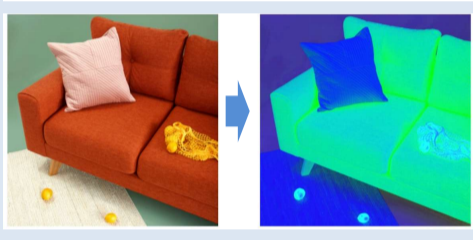
#### Find More Samples



Utilized ML, NLP, CV techniques to find more sample data and address the scarcity of fraud examples

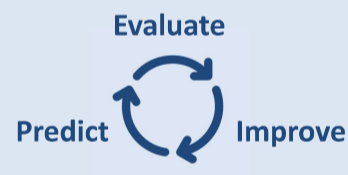
### PoC & Online Test

#### Optimized Image Recognition Solution



Achieving High Performance in Both Computational and Accuracy with an HSV Color Histogram Approach

#### UX and ML Ops Design for Result Analysis



Elaborated UX and ML Ops Framework for an MVB with Azure Logic App for Online Prediction Test and Improvement

### API Integration

#### Asynchronous wait-less system design



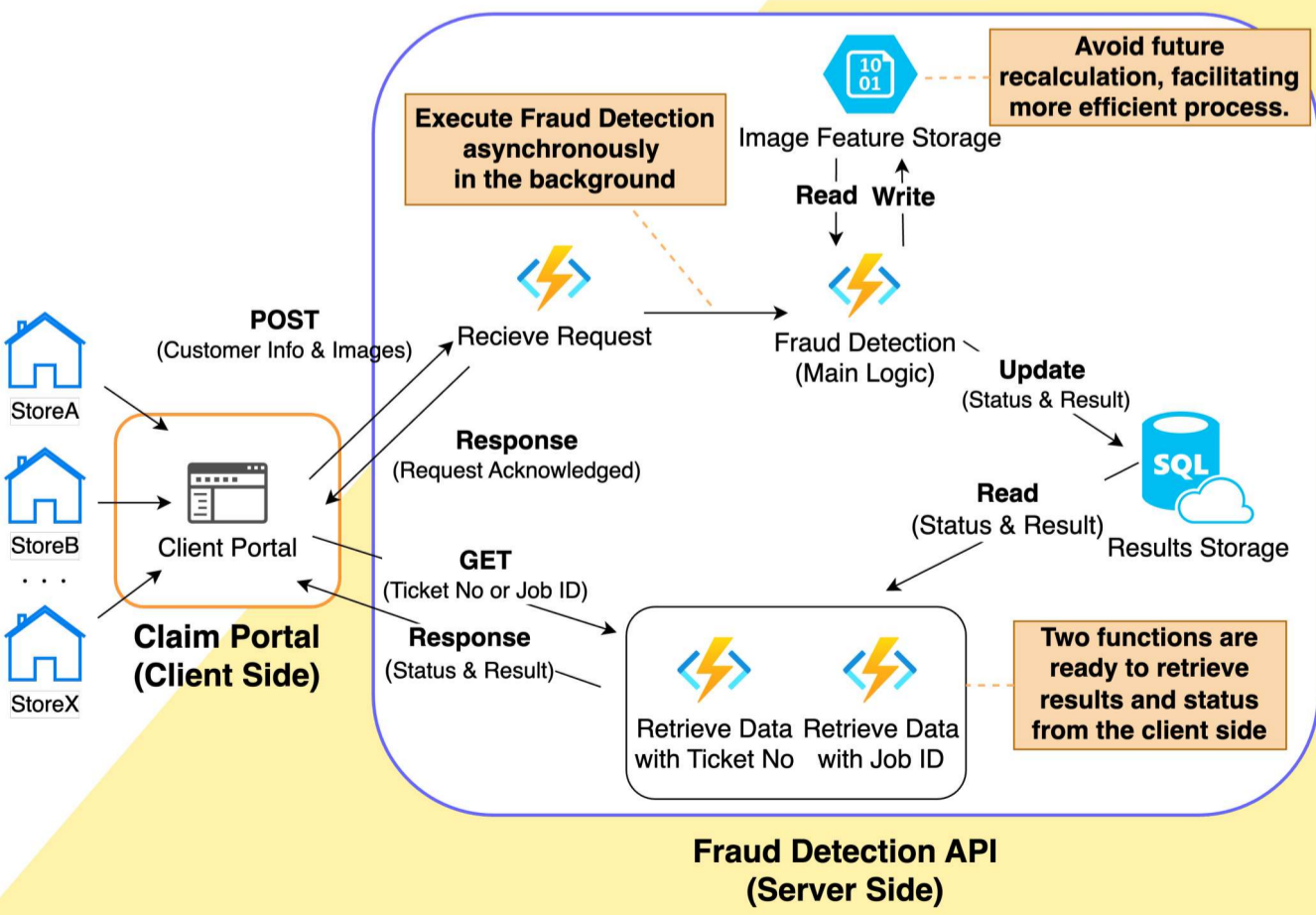
Staff can proceed without waiting and retrieve results later by asynchronous and persistent system design

#### Serverless API on Cloud



Cost-efficient and Scalable API with serverless Function App and Cloud-Native architecture

## API System Architecture



## Result

During the 2 months after deployment:

# 4 Fraud prevented

Products: Wardrobe, Table x 2, TV  
Fraud: Cropping, Figure Added, Duplication

*I am very happy because the data matches what we want. Thanks for the support. This system is necessary to be integrated for our claim portal.*

Operator

*I'm very satisfied with this Fraud Detection system. Let's improve it and copy it to other business case.*

Operational Manager