

Package Damage Report

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AJKRV (Team 28)



Who Are We?

Introductions



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Package Damage Report

Overview

- Detection and analysis of package damages at fulfillment centers
- **Category:** Supply Chain and Transportation Network

WHY?

1. Save on reshipment and damage claims costs
2. Identify trouble spots in the supply chain early on
3. Accurately detect damaged packages and gather insight

HOW?

- Detect damaged packages using an advanced machine learning model
- Inform managers of damaged package statistics through detailed visual report

Overview

Business

Problem

- Damaged Packages
- Cannot assess damage to contents of package until it is too late

Solution

- Automated Package Damage Detection
- Analytics Dashboard

Impact

- Savings
 - Shipping-back-to-sender costs
 - Damage claims costs
- Business Operations
 - Predict trouble spots
 - Improved resource allocation
- Customers get fewer damaged packages

Solution

Current State


Package Condition Sampling Reporting - Windows Internet Explorer provided by UPS

http://pcsr.inside.ups.com/pcsr/audit/pcsraudit.asp

File Edit View Favorites Tools Help

Package Condition Sampling Reporting

Inside.ups.com | Site Guide | Site Search | News | Web Central | Library | E-Mail

 Package Condition Status Reporting

You are logged in as app1yt EXIT

Audit Audit Search

Enter Building SLIC

SLIC Tracking No Consignee Info

Auditor Carton/Box Re-used ☐ No ☐ Yes Good Condition ☐

If not in Good Condition, Check Package Condition(s) that apply.

Processing Dirt/Wear	Belt Burn	Footprints/Tire Tracks	Dents/Creasing	Corners Crushed	Carton Crushed	Surface Tears/Punctures	Wet
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For general questions regarding this website, contact udcsupport@ups.com
Last Updated: July 14, 2011

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Local intranet | Protected Mode: Off

- Image upload application from **2013-2015** (decommissioned)
- Back to manual spot-checking

Solution

Competition

- **Amazon**
 - Began developing AI-based damage detection in **2021**
 - Currently rolling out in warehouses globally
- **FedEx** and **USPS** have no equivalent

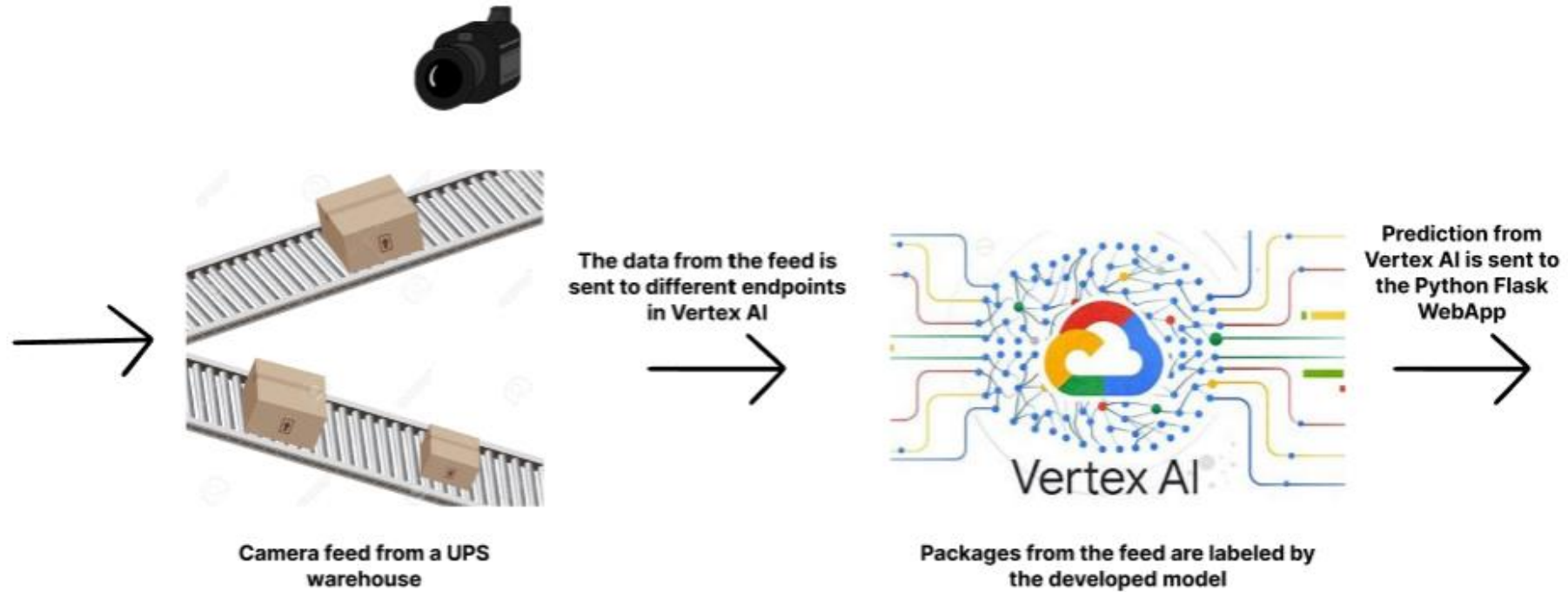
Solution

Data Flow



Solution

Data Flow

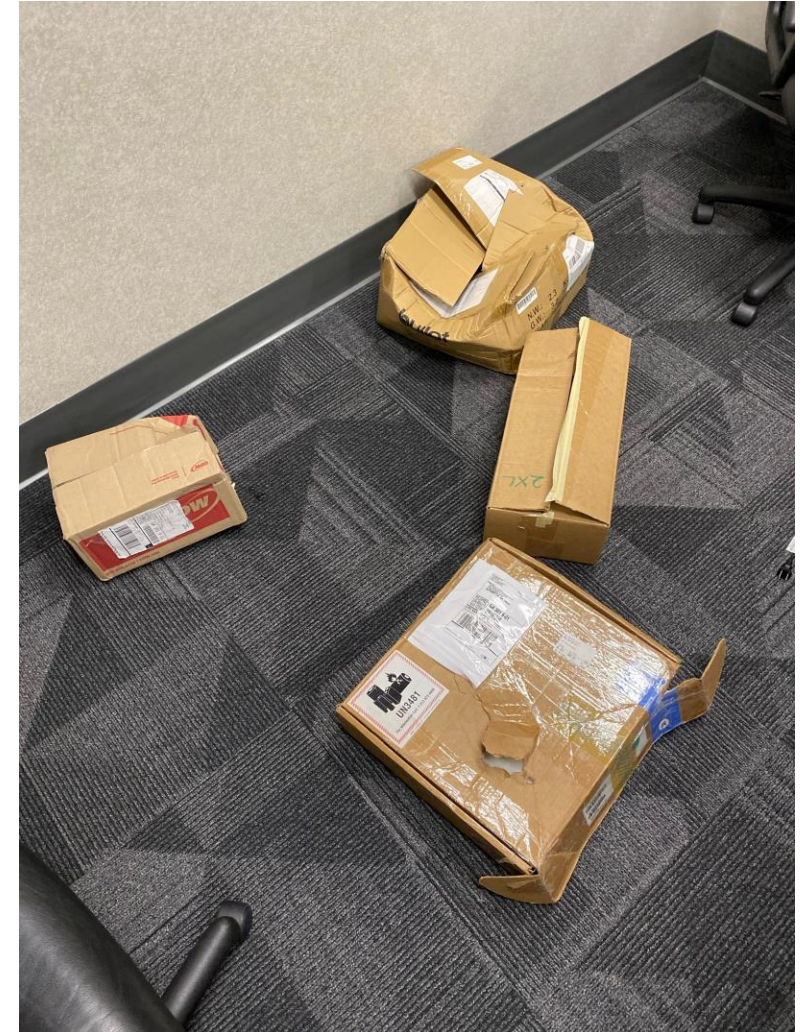


Solution

Model

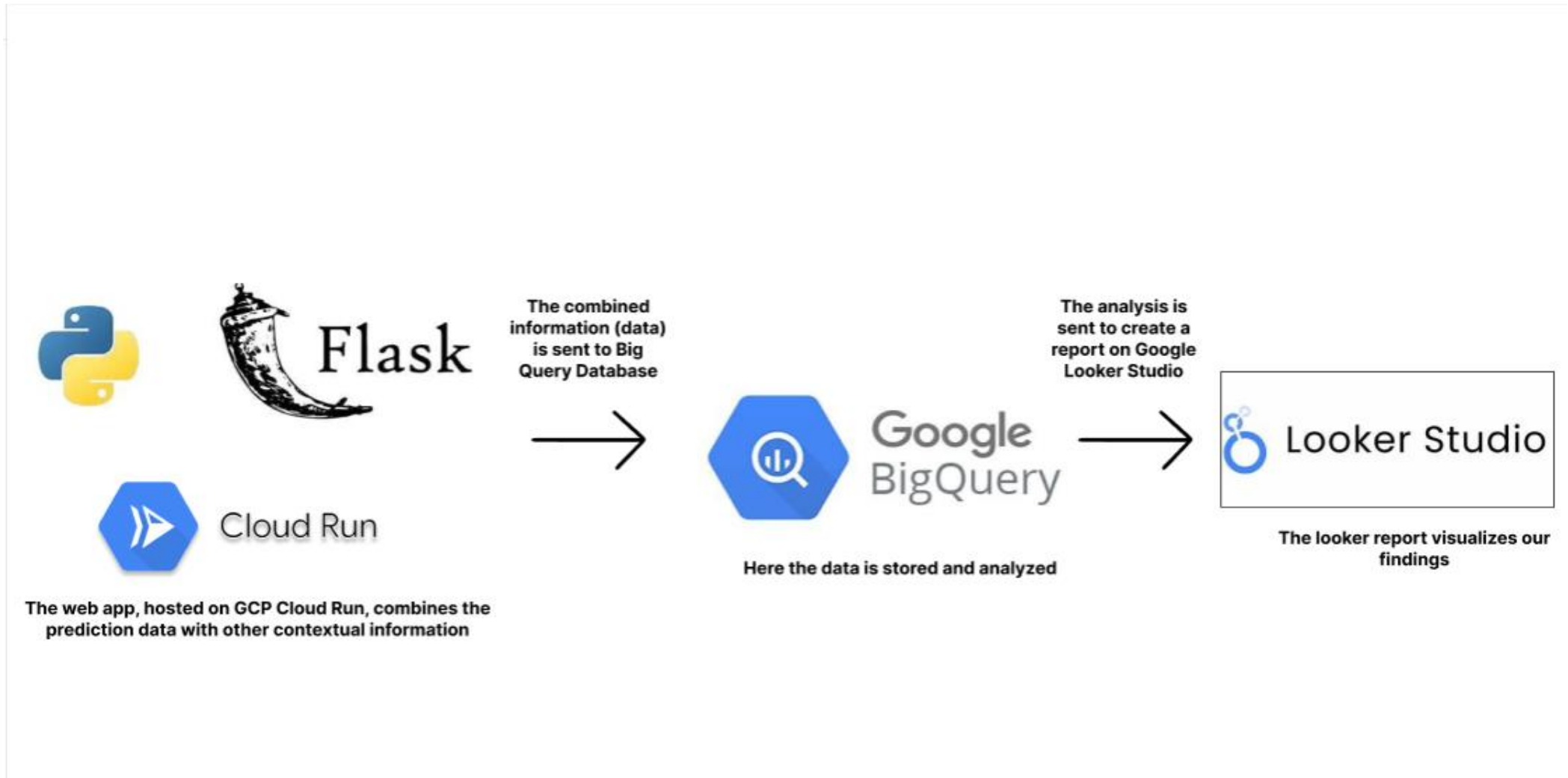
Labeled Visual AI Model

- Sorts packages based on existence of perceived external damage
- Trained using 240 images of varying packages and varying forms of damage
- 92% accuracy rate at distinguishing damaged packages from undamaged packages when sampled



Solution

Data Flow



Solution

Google Cloud Platform Products



Vertex AI



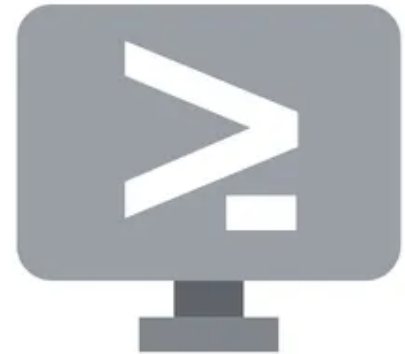
BigQuery



Cloud Run



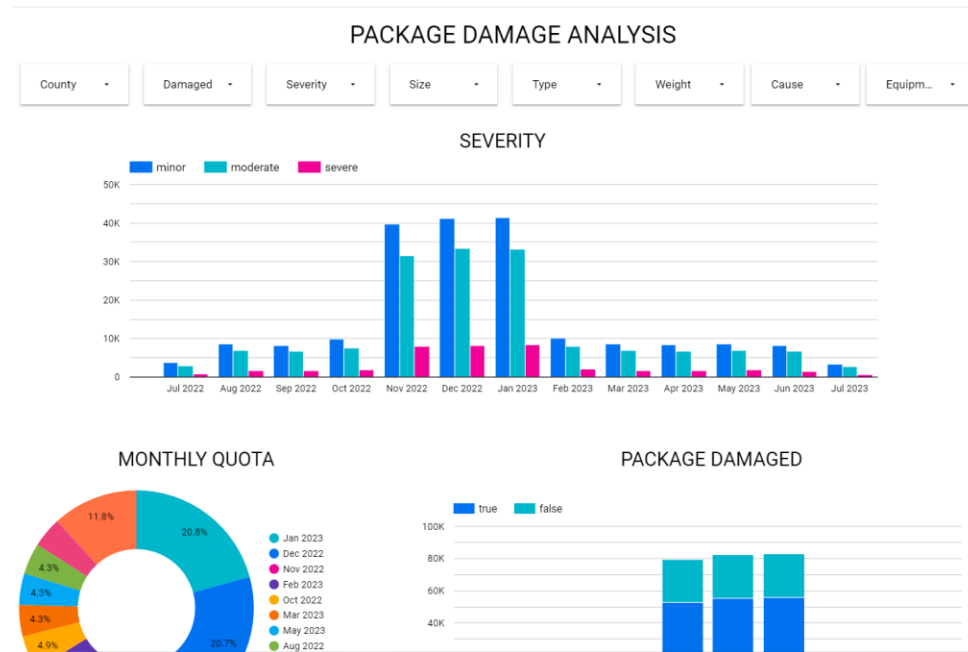
Looker Studio



Cloud Shell

Solution

End Product



Interactive Interface

- Greatly increases visibility of geographical and chronological trends

Broad Use Case

- Allows corporate supervisors to draw conclusions about large-scale patterns
- Gives warehouse managers data necessary to monitor their own consistency in treating packages safely

Complements Customer Service

- Creates reliable measure of whether package was damaged in transit
- Damage claims can be dismissed or accepted more categorically, which can save time and money

Company Benefits

Use Advantages

Incorporating Quantifiable Package Quality Goals

- Promotes consistently high quality globally
- Shows a true dedication to the customer and delivering their package safely
- Allows managers to cut repackaging, save in time and money

Making Customer Damage Claim Handling More Robust

- Gives strong indicators of package quality which show the condition of package when delivered to consumer
- Helps quickly and verifiably resolve disputes and increase positive accountability for UPS

Easily Scalable

- Additional data can be easily included in the reports
- Allows any number of metrics to be used for analytics



DEMO





THANK YOU