

PARS - Package Analysis and Rerouting System



AGENDA



Problem Statement
Solution Approach
Physical Architecture
Logical Architecture
Tech Stack
Assumptions
Visualization
Demonstration

PROBLEM STATEMENT

- In large-scale logistics operations like UPS, damaged or missing barcodes disrupt automated sorting, thereby forcing a manual inspection and redirection.
- This slows processing, increases labor costs, and risks routing errors.
- A solution is needed to extract shipment details directly from package labels to restore efficiency and ensure timely delivery at the absence of readable barcodes.
- The goal is to enable accurate and automated rerouting even when barcodes are damaged or missing.

SOLUTION APPROACH

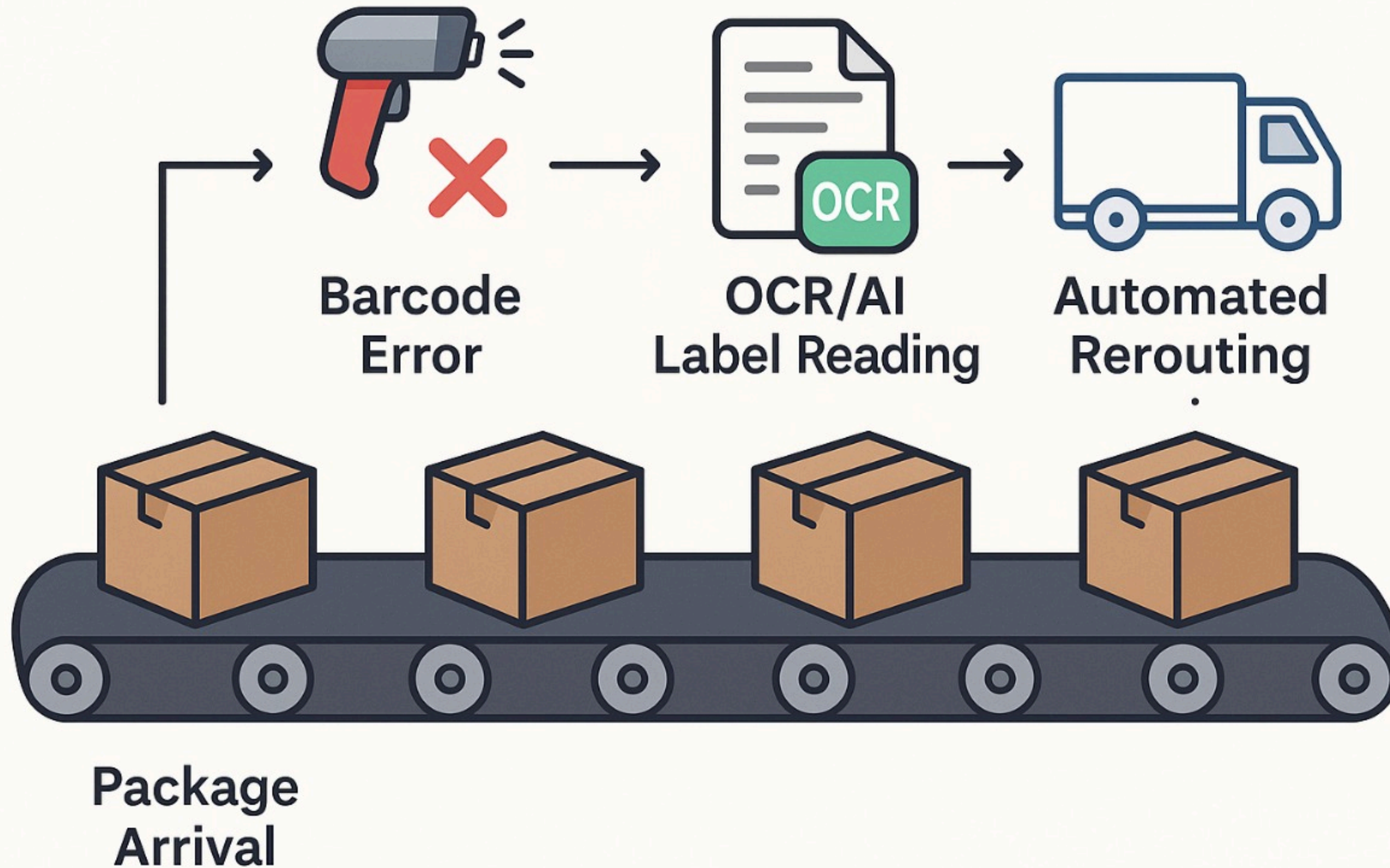




Image Upload



Detail Extraction



Data Presentation & Insights

Step 1: Image Upload

- Users upload images of damaged package labels through an intuitive web interface.

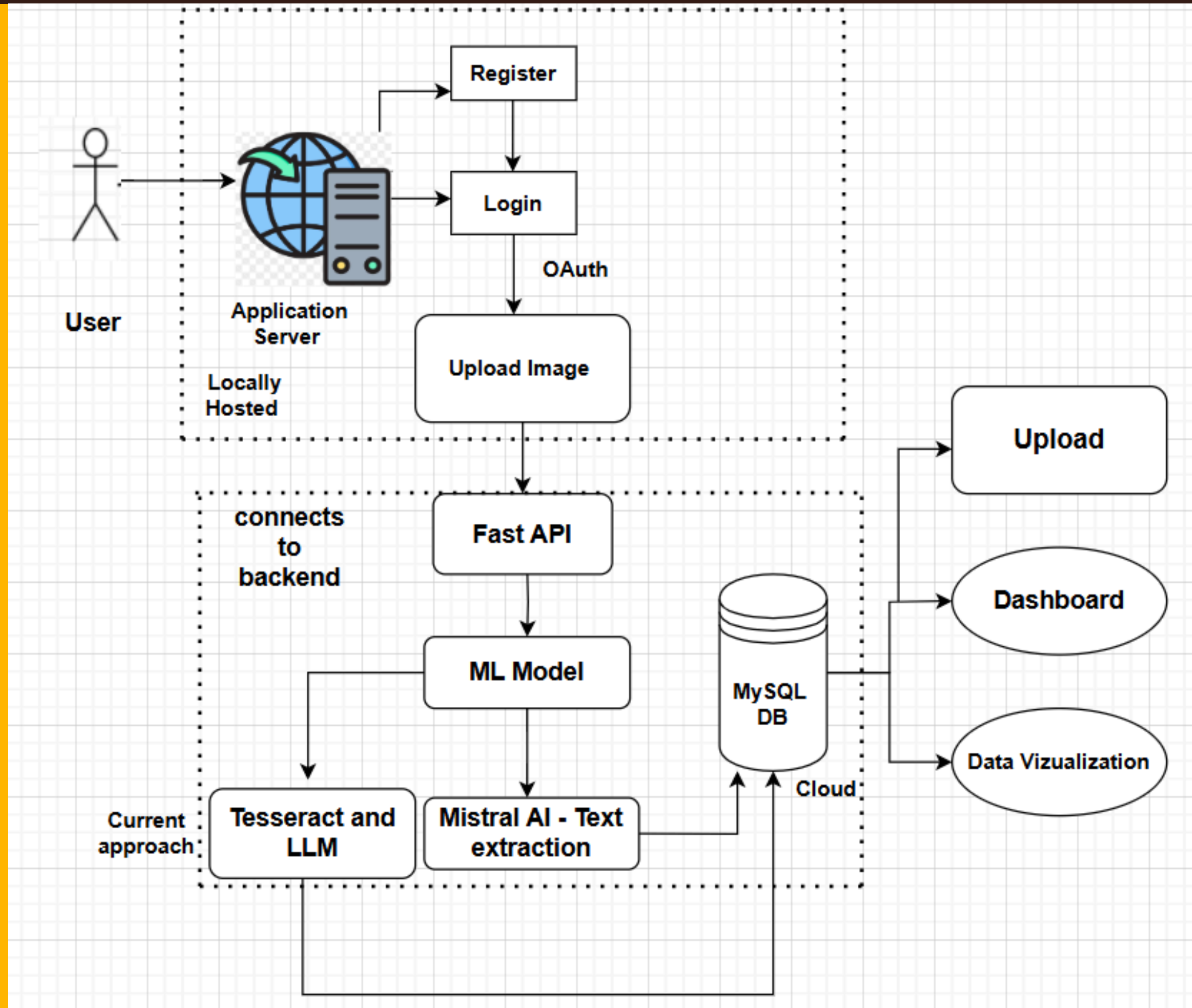
Step 2: Detail Extraction

- The system processes each image to extract critical shipment information like tracking ID and recipient address using advanced parsing techniques.

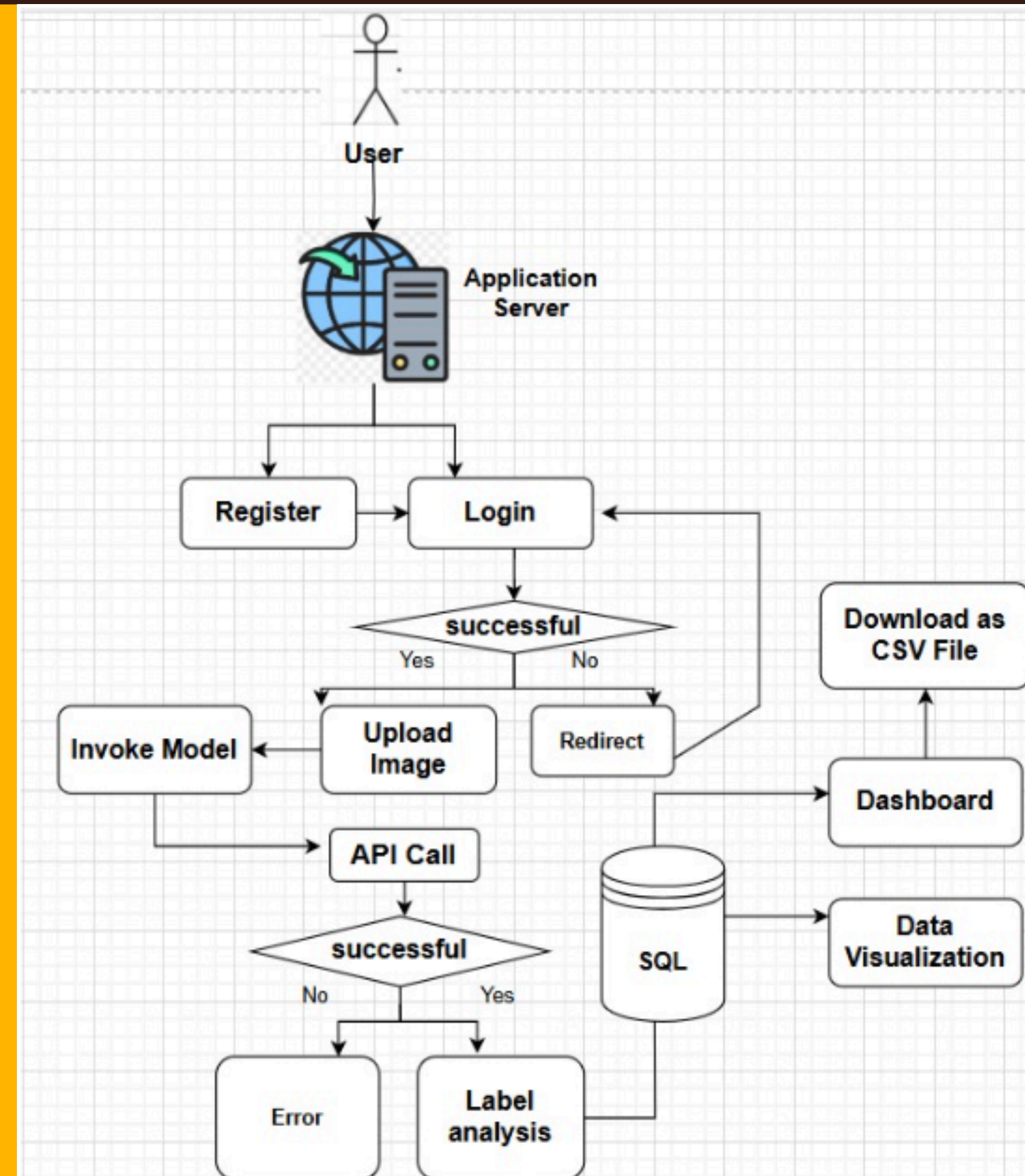
Step 3: Data Presentation & Insights

- Extracted data is structured for review, while an analytics dashboard provides real-time insights on damage trends and routing performance.

PHYSICAL ARCHITECTURE



LOGICAL ARCHITECTURE



TECH STACK



Layer	Tools and Tech
Frontend	React
OCR and Detail Extraction	Tesseract and LLM/Mistral AI
Backend	Python and Fast API
Database	MySQL
Analytics and Visualization	Google Looker Studio
Version Control	Git

ASSUMPTIONS

- The uploaded package label data is intact and accessible, upright, text is accurately captured, and adequately lit to ensure effective processing.
- Accepted image formats are JPG, JPEG, PNG with a maximum file size of 5MB.
- Package labels must be moderately visible; the system may not yield accurate results for severely damaged or obscured labels.
- Only the barcode is damaged; other informations like address, tracking ID, phone number, etc, in the label are visible clearly.



Logistics in Focus: Uncovering Damage Hotspots & Routing Insights

VISUALIZATION

Proportions of Shipment vs Non Shipment Labels

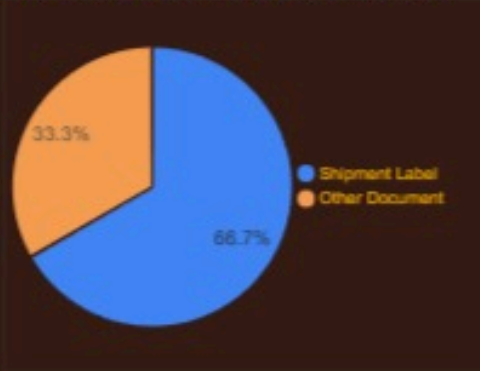
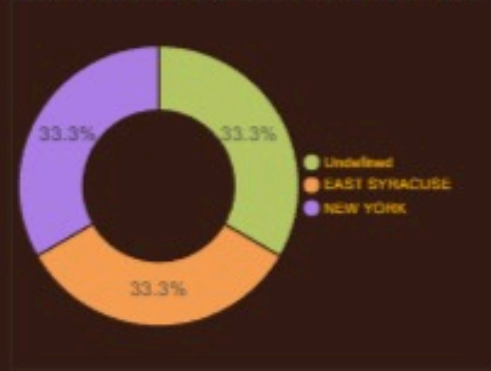
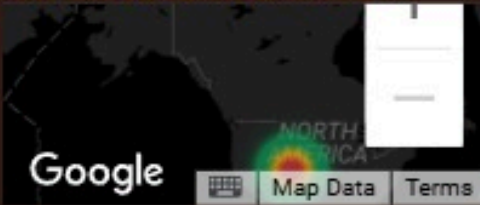


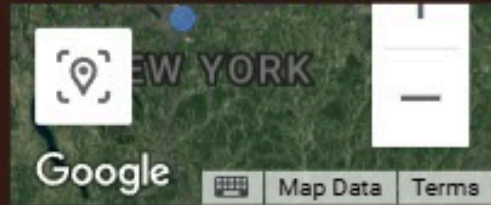
Chart Depicting Distributions of Affected Origin Cities



Origin Country Hotspots For Damaged Labels



Origin City Hotspots For Damaged Labels



Most Affected Country

USA

Peak Upload Date

June 14, 2025

Table of Upload Status based on ID

	1.	2.	3.
id	35	34	33
upload status	succe...	succe...	succe...
Record Count	1	1	1

1 - 3 / 3 < >

Success Rate Of Uploads



Note :

All current uploads are successful. The legend auto-updates based on available data, other statuses will appear when present.

Hourly Trend of Shipment Damanges



Peak Upload Hour

04 PM

Top Affected Pincodes (By Origin)



Distribution Of Uploaded Format



Extract Status (OCR) Distribution by ID



Top Impacted Origin-Destination Routes



- Delivers real-time insights into shipment routing performance for enhanced operational visibility.
- Identifies critical trends such as high-damage zones, peak failure periods, and rerouting frequency.
- Facilitates data-driven decision-making to optimize logistic workflows and minimize manual intervention.
- Enables continuous monitoring of system and OCR accuracy, allowing early detection of performance issues.
- Empowers management with clear visual summaries to support reporting and strategic planning.

DEMONSTRATION

Login Page



Package Analysis & Rerouting System

Username *

shubham

Password *

.....



Sign In

New user? [Register here](#)

Upload Page

Upload Labels

Only JPG and PNG files are allowed. Max size: 5MB. Max upload limit: 10 files.

✔ All files processed successfully!


⬆

Drag & drop files or

⬆

Browse Files

Selected Files (1)



L1_aug1.jpg

1.07 MB

🗑

Clear Files

Upload and Extract All

Extraction Results

✔ L1_aug1.jpg

Document Type: SHIPPING_LABEL

Is Shipping Label: Yes

Tracking Number: 1Z 840 263 02 9808 5320

Origin Address:

name	
phone_number	
street_address	165 S. 500 WEST, BEAVER UT 84713
city	BEAVER
state	UT
zipcode	84713
country	USA

Destination Address:

name	MATTHEW TOBIA
phone_number	3154311352
street_address	5001 BRITTONFIELD PKWY, EAST SYRACUSE NY 13057
city	EAST SYRACUSE
state	NY
zipcode	13057
country	USA

Dashboard Page

Filename	Upload Date	Upload Status	Extract Status	Document Type	Is Shipping Label	Tracking Number	Message	Origin Address	Destination Address
L1_aug1.jpg	6/15/2025	successful	successful	SHIPPING_LABEL	Yes	1Z 840 263 02 9808 5320	N/A	165 S. 500 WEST, BEAVER UT, 84713, BEAVER, UT, 84713, USA	MATTHEW TOBIA, 5001 BRITTONFIELD PKWY, EAST SYRACUSE N 13057, EAST SYRACUSE, NY, 13057, USA
Screenshot 2025-02-12 120553.png	6/15/2025	successful	skipped	OTHER	No	N/A	Document is not a shipping label		
L1_aug1.jpg	6/15/2025	successful	successful	SHIPPING_LABEL	Yes	1Z 840 263 02 9808 5320	N/A	165 S. 500 WEST, BEAVER UT, 84713, BEAVER, UT, 84713, USA	MATTHEW TOBIA, 5001 BRITTONFIELD PKWY, EAST SYRACUSE N 13057, EAST SYRACUSE, NY, 13057, USA
L1_aug4.jpg	6/15/2025	successful	successful	SHIPPING_LABEL	Yes	1Z 840 263 02 9808 5320	N/A	DFA, 165 S 500 WEST, BEAVER, UT, 84713, USA	MATTHEW TOBIA, 5001 BRITTONFIELD PKWY, EAST SYRACUSE, NY, 13057, USA
L1_aug1.jpg	6/15/2025	successful	successful	SHIPPING_LABEL	Yes	1Z 840 263 02 9808 5320	N/A	165 S. 500 WEST, BEAVER, UT, 84713, USA	MATTHEW TOBIA, 5001 BRITTONFIELD PKWY, EAST SYRACUSE, NY, 13057, USA

Analytics Page

UPS Label Insights

A visual dashboard analyzing shipment label trends and routing hotspots.

Most Affected Country

No data

Peak Upload Date

June 15, 2025

Table of Upload Status based on ID

	1.	2.	3.	4.
id	35	37	38	3
upload_status	succ...	failed	failed	f
Record Count ▾	1	1	1	

1 - 10 / 18

<

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Sucess Rate Of Uploads



Note :

All current uploads are successful. The legend auto-updates based on available data, other statuses will appear when present.

Hourly Trend of Shipment Damanges



Peak Upload Hour

Looker Studio

User Profile

User Profile

Username: shubham

Email: shubham@ups.com

Role: admin

Status: approved

[Go to Dashboard](#)

[Logout](#)

[Delete Profile](#)

Admin Management

UPLOAD

DASHBOARD

ANALYTICS

USER MANAGEMENT

User Management

Add New User

Username	Email	Role	Status	Actions
shreyas	shreyas@ups.com	admin	approved	Delete
shivani	shivani@ups.com	user	approved	Delete
charu	cr@ups.com	user	approved	Delete
shubham	shubham@ups.com	admin	approved	Delete
anjana	anjana@ups.com	user	approved	Delete
swapnil	swapnil@ups.com	user	approved	Delete



THANK YOU

