# PARS - Package Analysis and Rerouting System

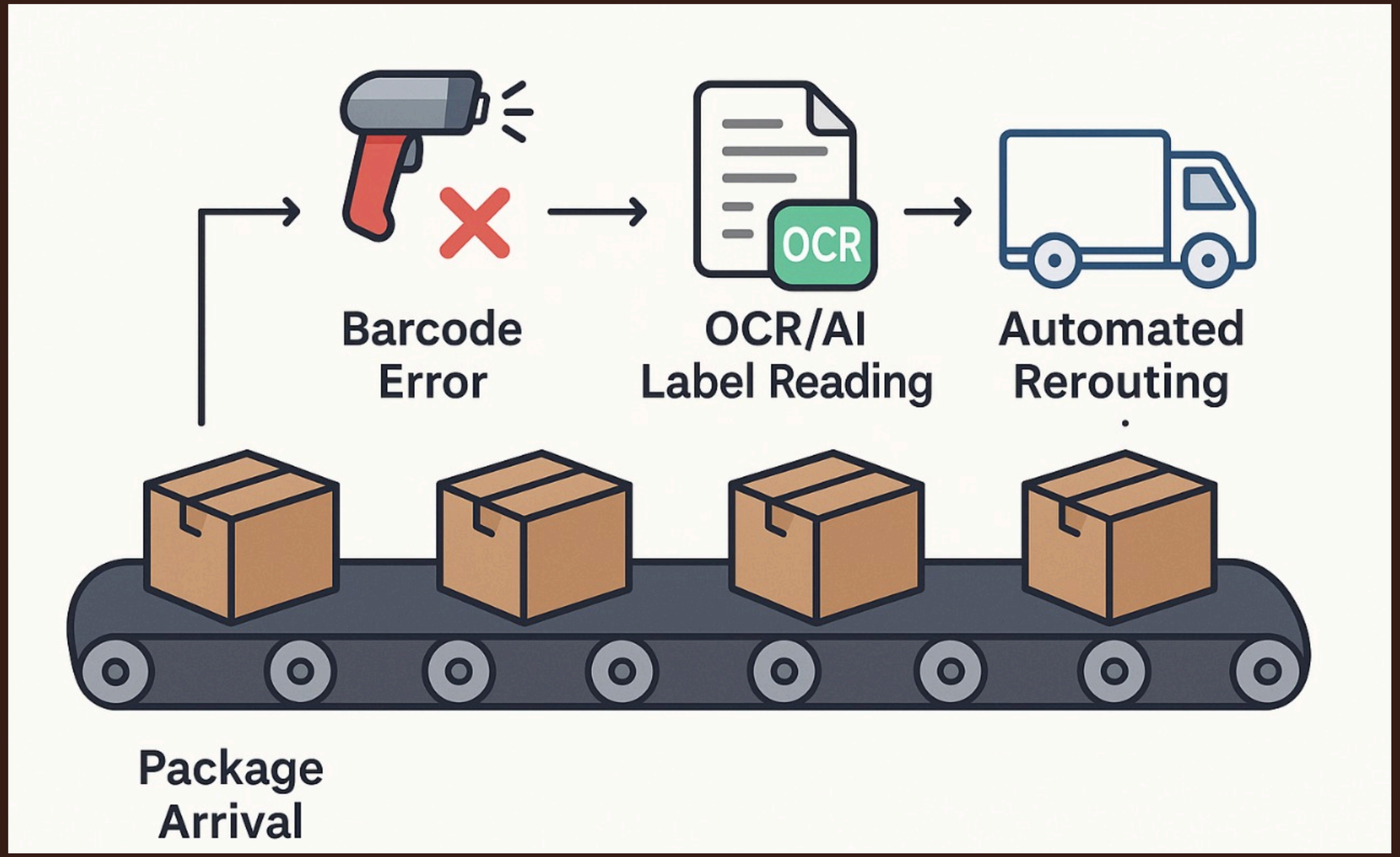
# AGENDA

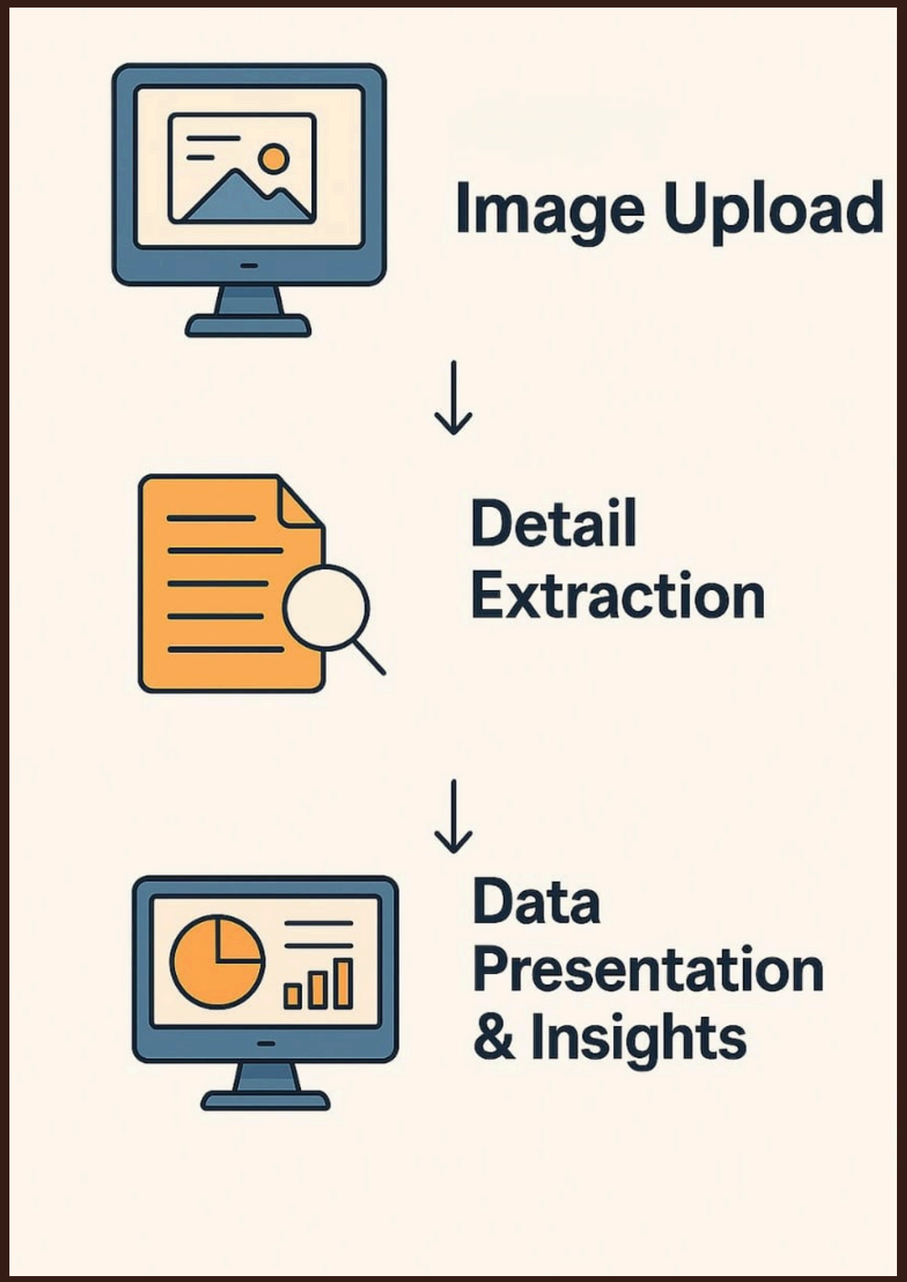
- Problem Statement
- Solution Approach
- Physical Architecture
- Logical Architecture
- Tech Stack
- Assumptions
- Visualization
- Demonstration

# 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






**Step 1: Image Upload**

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

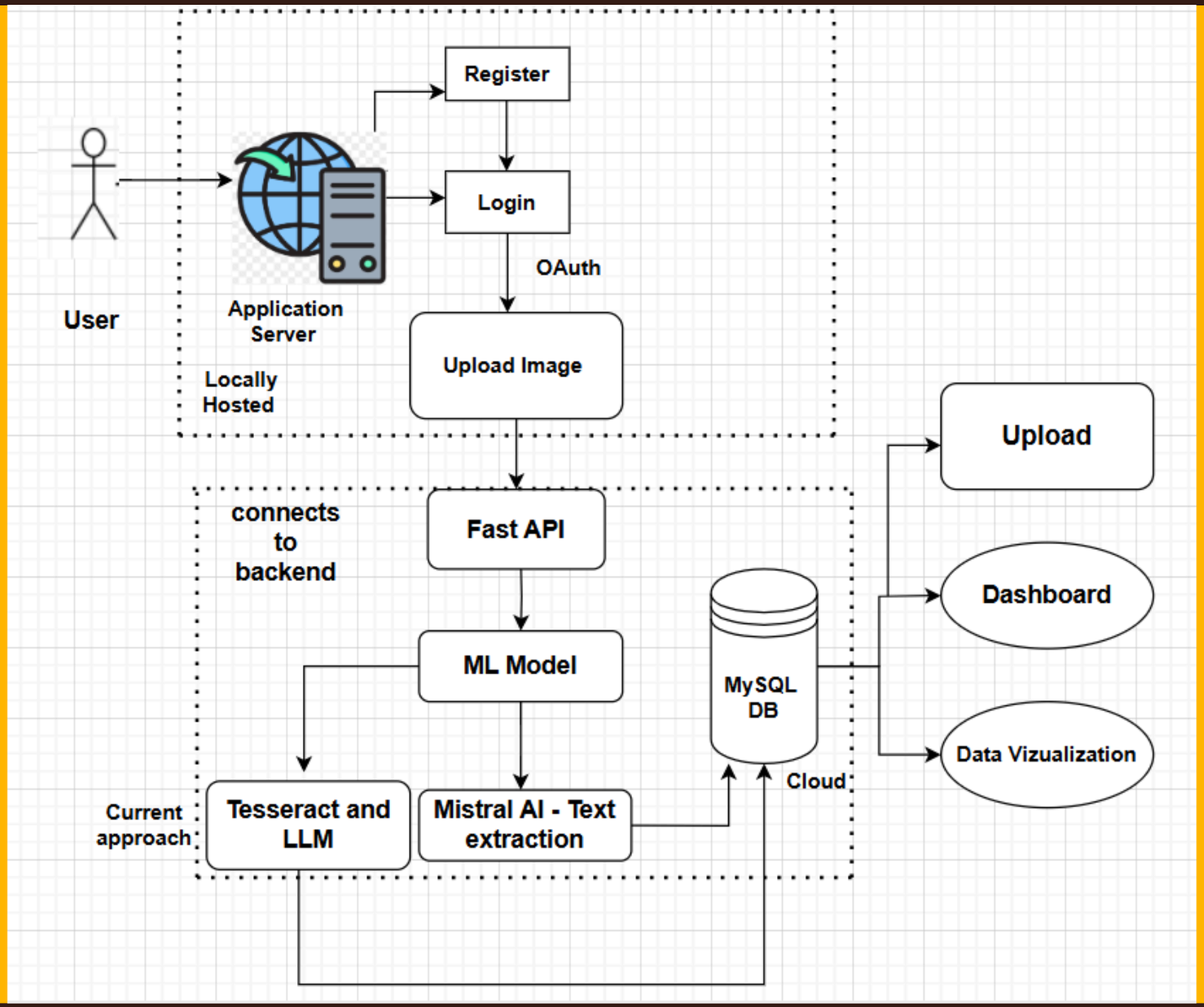
**Step 2: Detail Extraction**

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

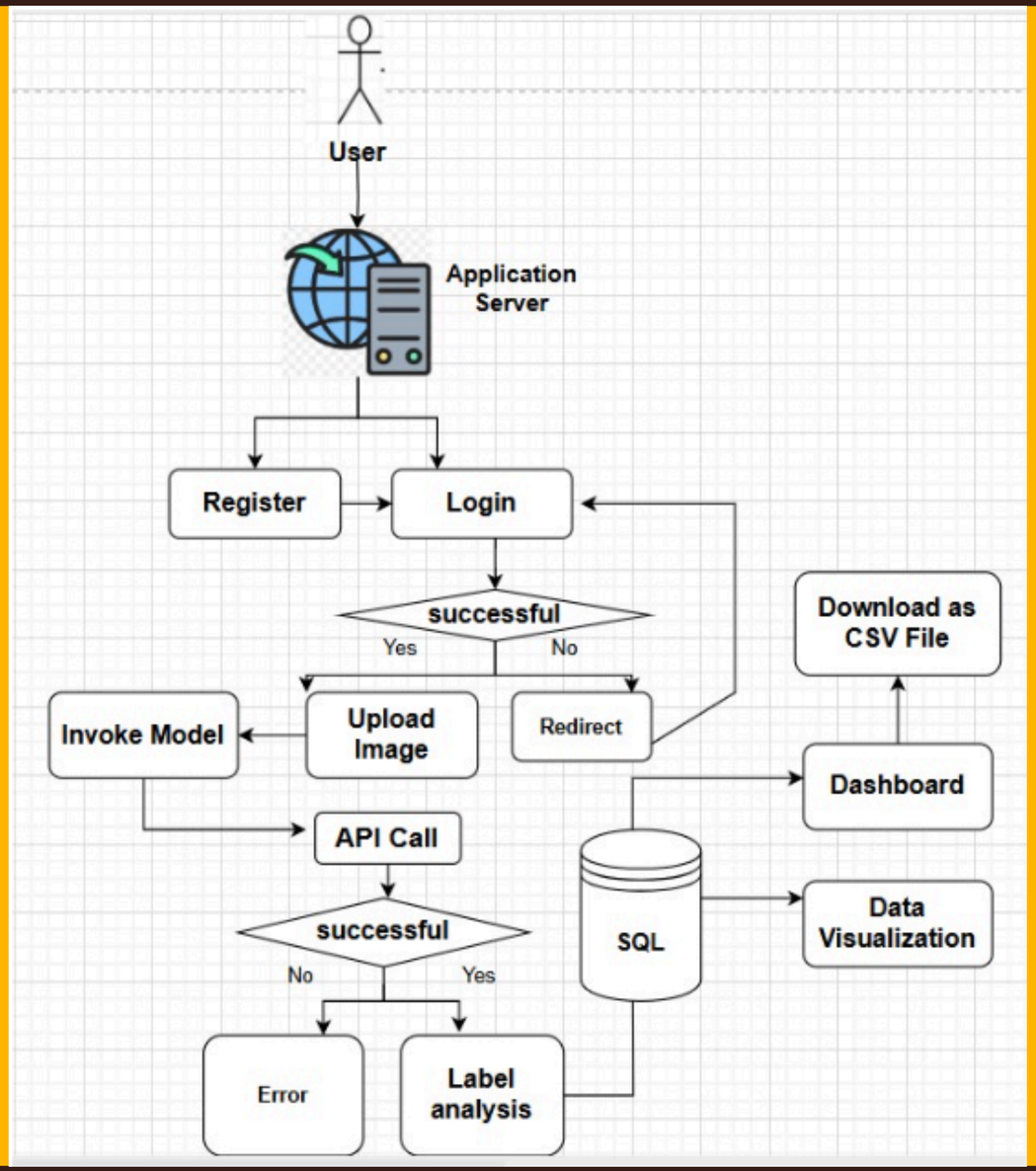
**Step 3: Data Presentation & Insights**

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

# PHYSICAL ARCHITECTURE



# LOGICAL ARCHITECTURE



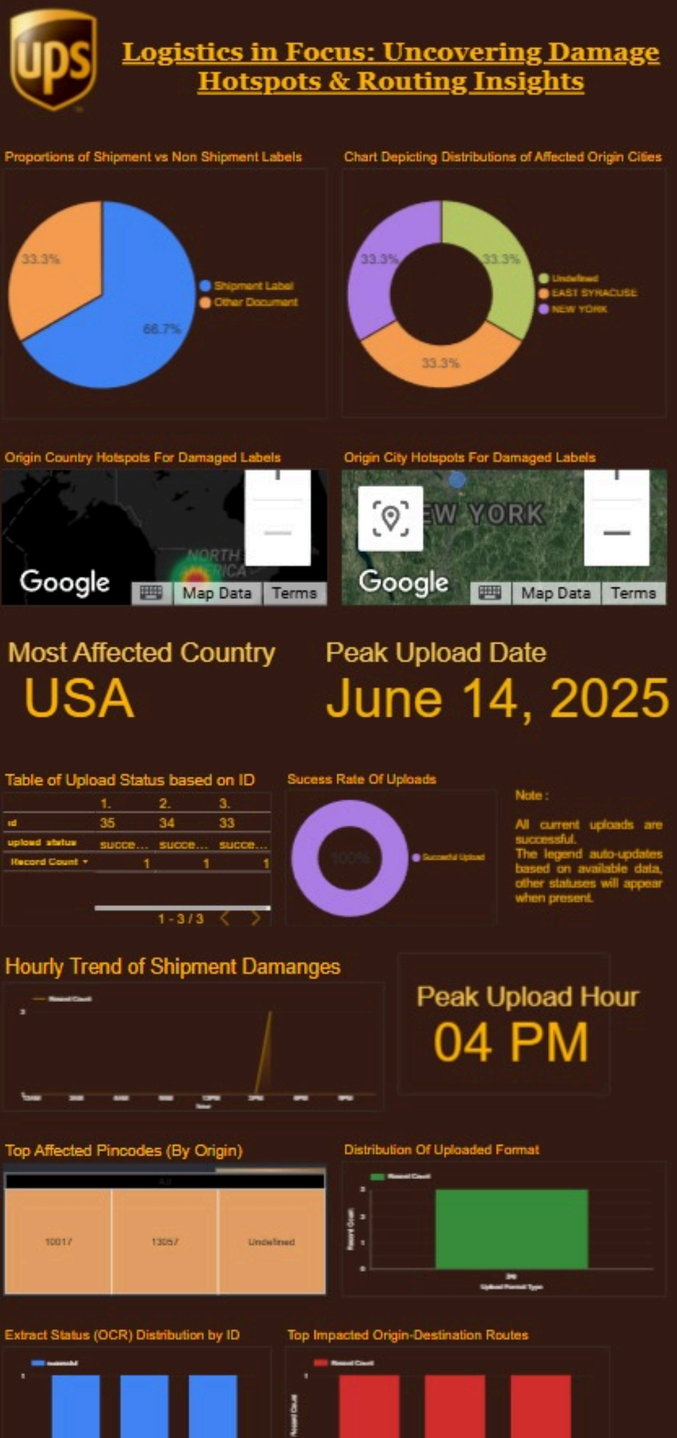
# TECH STACK

| 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.

# VISUALIZATION

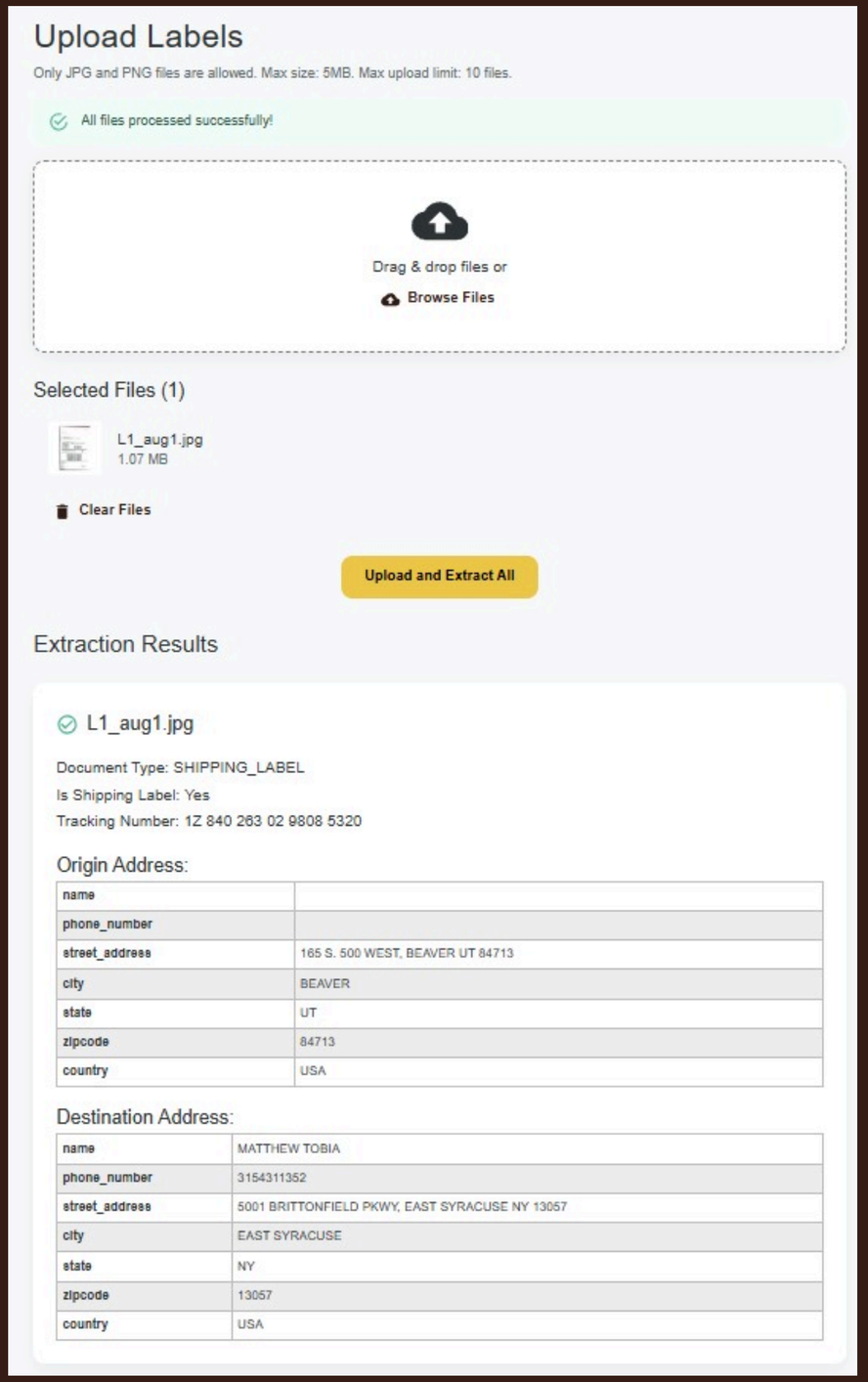



- Delivers real-time insights into shipment routing performance for enhanced operational visibility.
- Identifies critical trends such as high-damage zones, peak failure periods, and rerouting frequency.
- Facilitates data-driven decision-making to optimize logistic workflows and minimize manual intervention.
- 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.

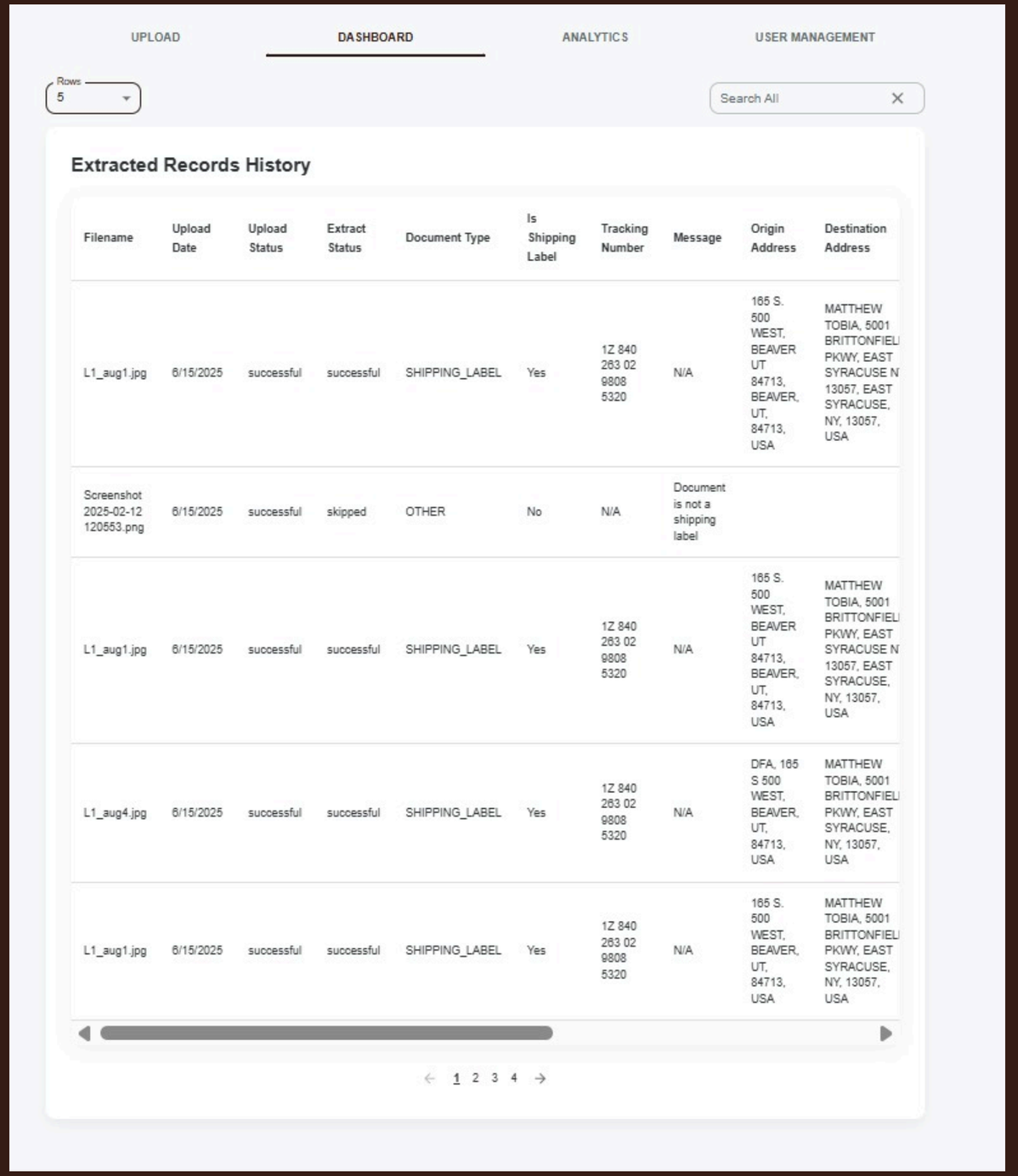
# DEMONSTRATION

## Login Page

# Upload Page

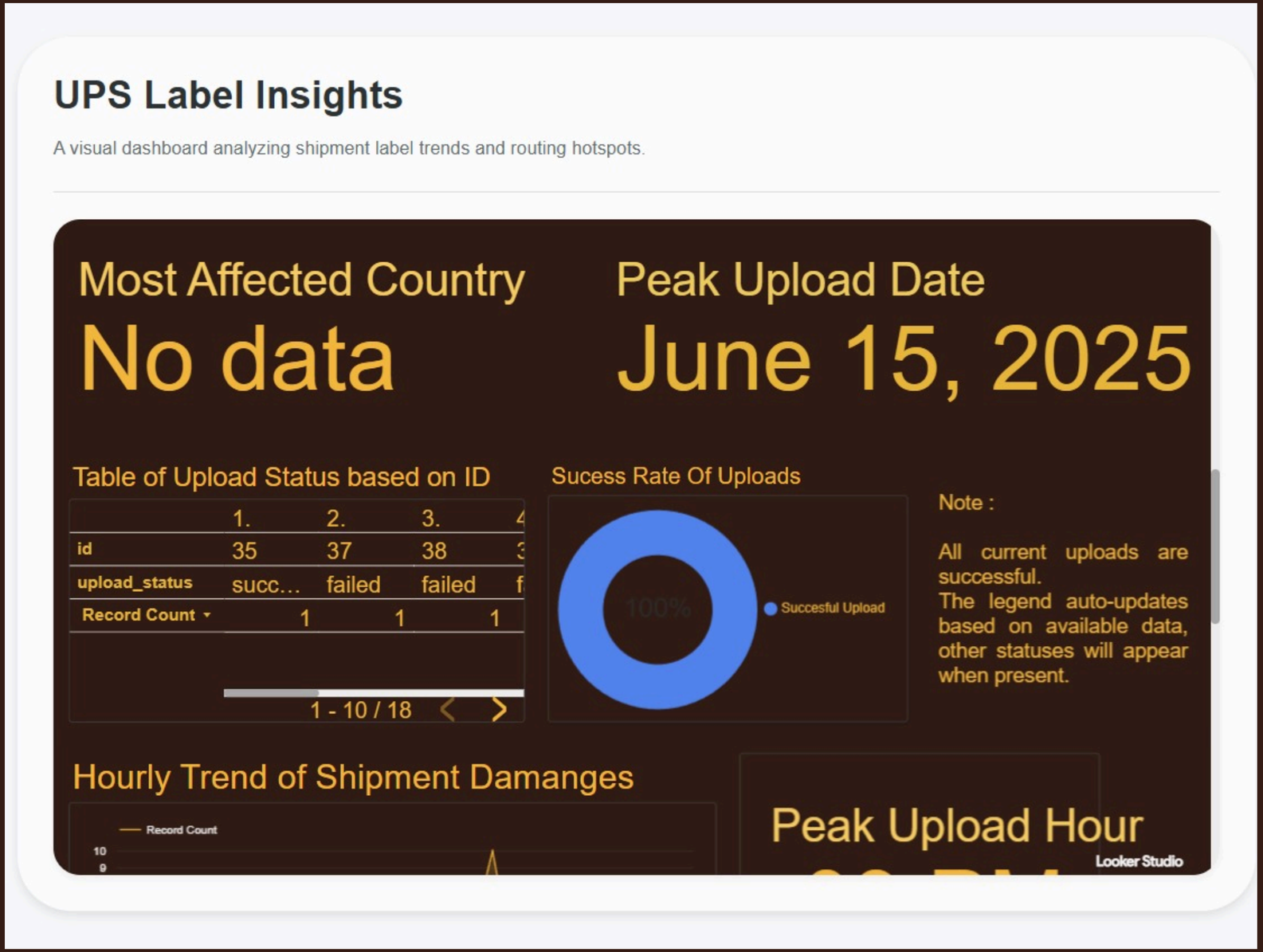

Upload Labels
Only JPG and PNG files are allowed. Max size: 5MB. Max upload limit: 10 files.
All files processed successfully!
Drag & drop files or
Browse Files
Selected Files (1)
L1_aug1.jpg
1.07 MB
Clear Files
Upload and Extract All
Extraction Results
L1_aug1.jpg
Document Type: SHIPPING_LABEL
Is Shipping 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

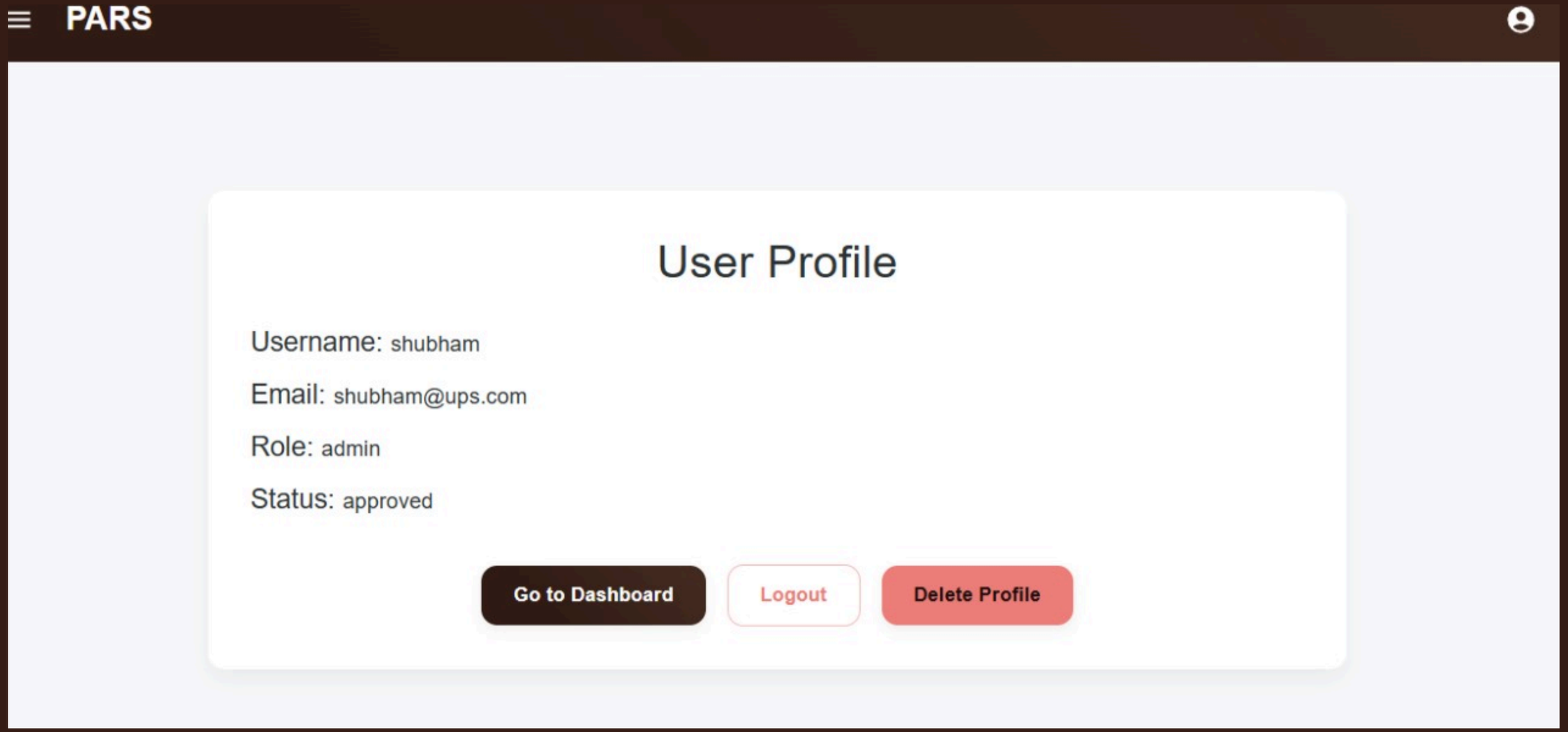



| Filename | Upload Date | Upload Status | Extract Status | Document Type | Is Shipping Label | Tracking Number | Message | Origin Address | Destination Address |
|---|---|---|---|---|---|---|---|---|---|
| L1_aug1.jpg | 6/15/2025 | successful | successful | SHIPPING_LABEL | Yes | 1Z 840 263 02 9808 5320 | N/A | 165 S. 500 WEST, BEAVER UT 84713, BEAVER, UT, 84713, USA | MATTHEW TOBIA, 5001 BRITTONFIELI 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 BRITTONFIELI 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 BRITTONFIELI 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 BRITTONFIELI PKWY, EAST SYRACUSE, NY, 13057, USA |

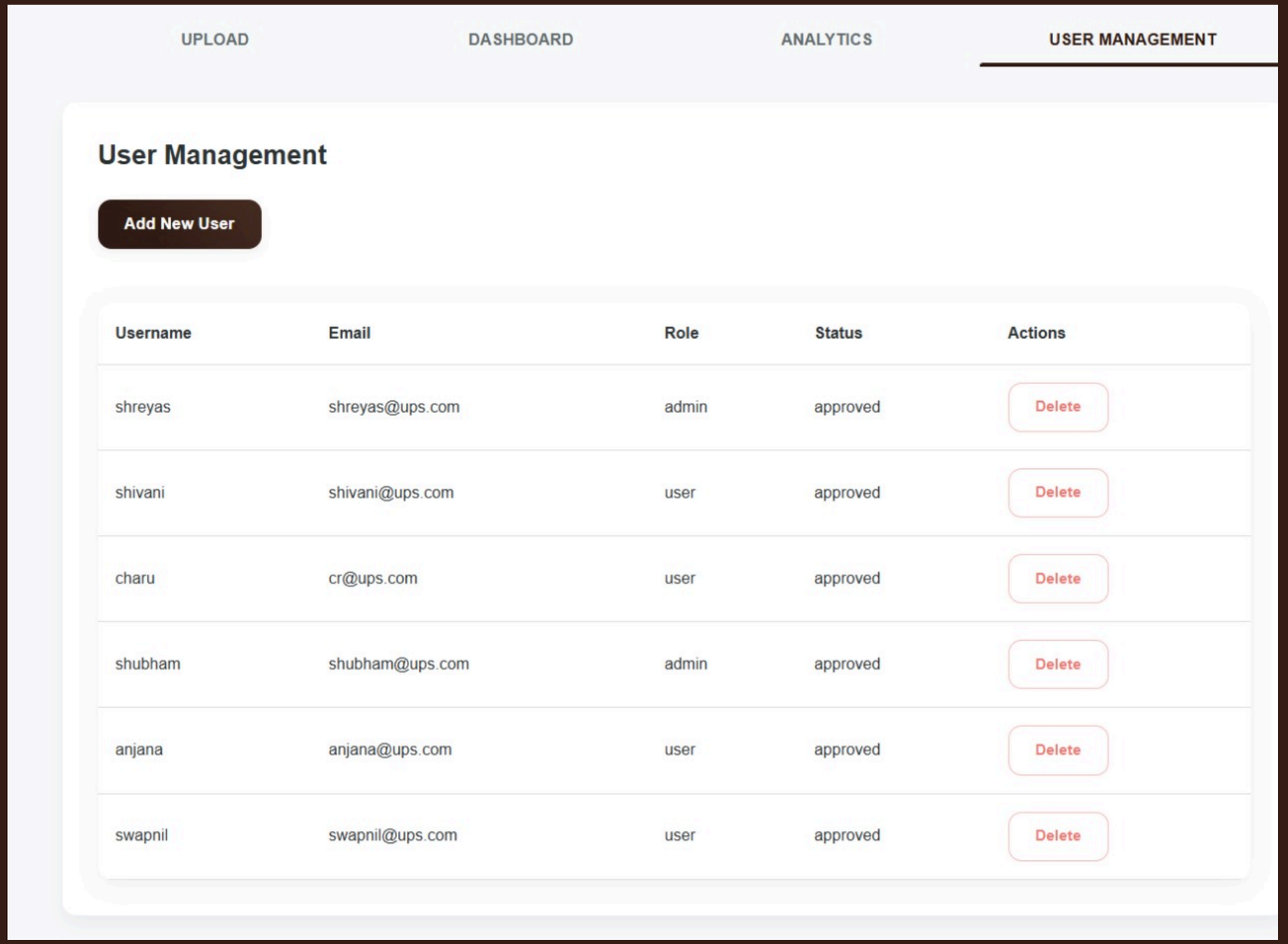
# Analytics Page



# User Profile



# Admin Management



# THANK YOU