

# E-Commerce

## Automated Resolution System

Le Minh Nguyen - K224161829

# CHALLENGES

---

## Current challenges in e-com customer support

- Up to 80% of all support tickets are for simple, repetitive questions (Source).
- Without an intelligent "receptionist" to triage these requests, human agents waste the majority of their time on simple tasks.
- 60% of customers report that waiting for a response is the most frustrating part of a service interaction (Source).

Using a simple chatbot:

- They can handle simple keywords but fail at any real conversational complexity, creating a "dead end" for the user.

**What if we use GenAI + tools to handle daily customer support task?**

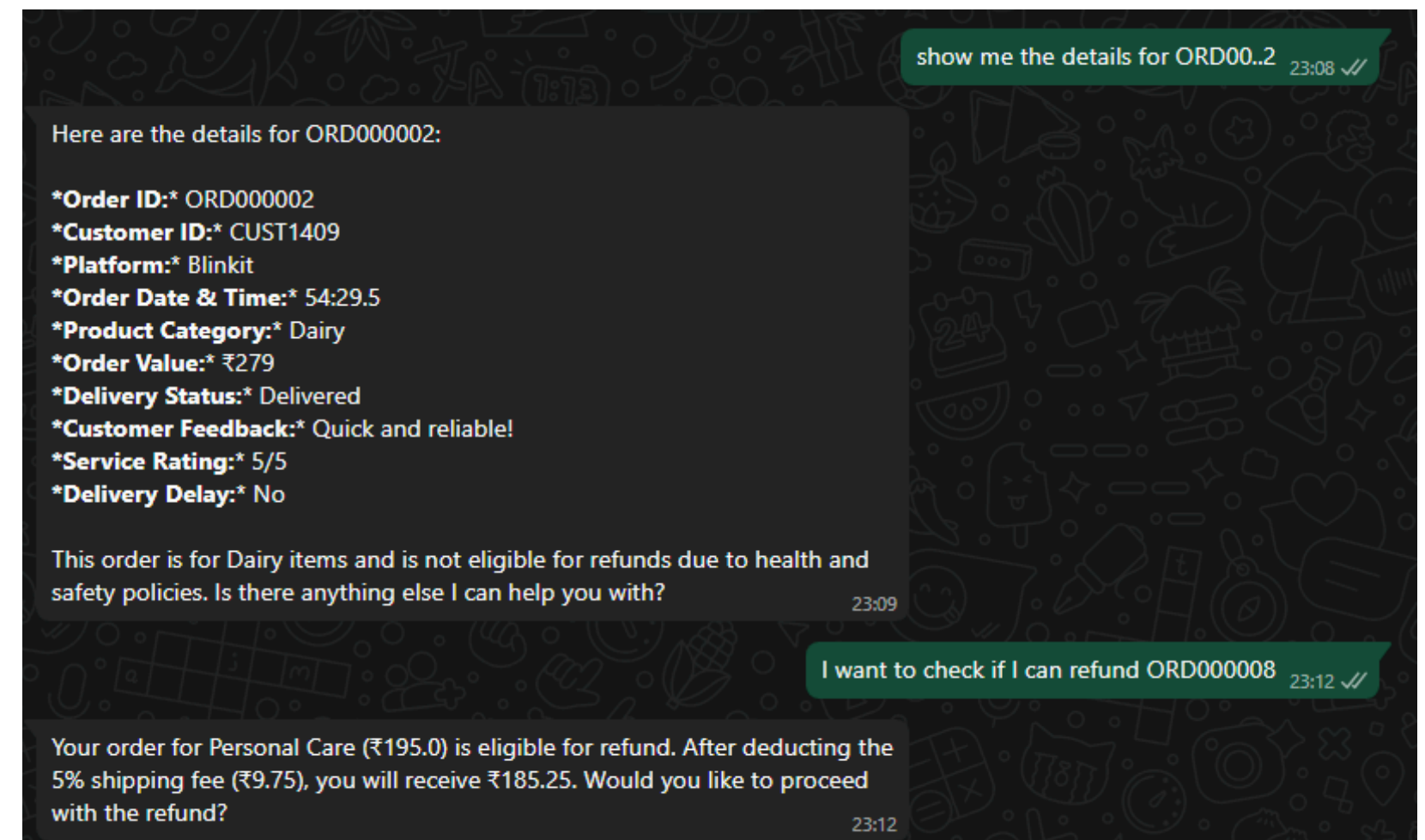
# PROJECT

---

The project implements an end-to-end AI-powered customer service agent that handles e-commerce queries through WhatsApp. The system intelligently triages customer messages, queries order databases, processes refunds, and maintains conversational context - all while providing a natural, human-like interaction experience.

Key features:

- Conversational AI
- MCP Tool Orchestration
- Intent-Driven Responses
- Human Escalation
- Real-time Dashboard



# TECH STACK

## BACKEND

### FASTAPI

Called by WhatsApp Business (Pywa)



### LLM

Groq (moonshotai/kimi-k2-instruct-0905)



### MCP SERVER

Model Context Protocol:

- Natural Language Understanding (NLU) Model
- Query Database
- Refunds
- Human Agent Alert



## FRONTEND

### USER-FACING APP

WhatsApp Business



### INTERNAL DASHBOARD

Streamlit



### DATABASE

MongoDB

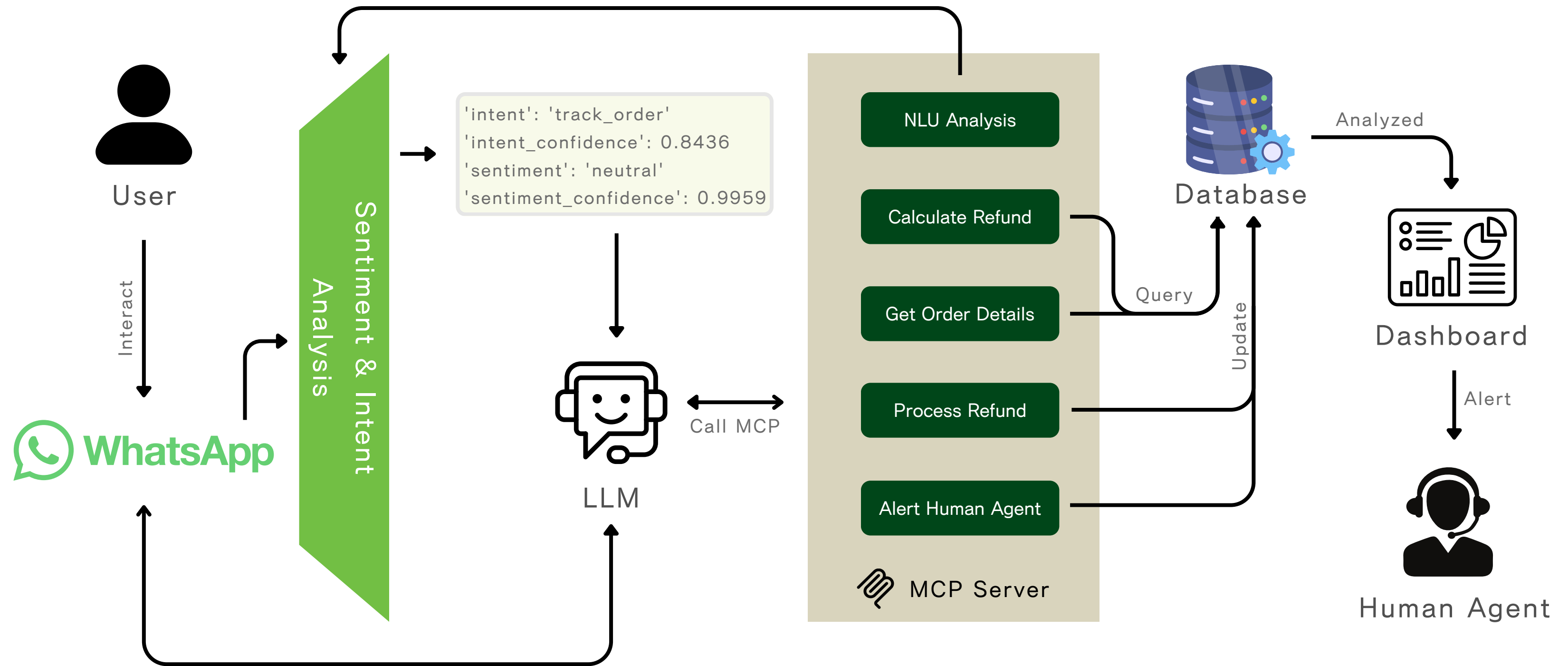


### DEPLOYMENT

ngrok



# WORKFLOW



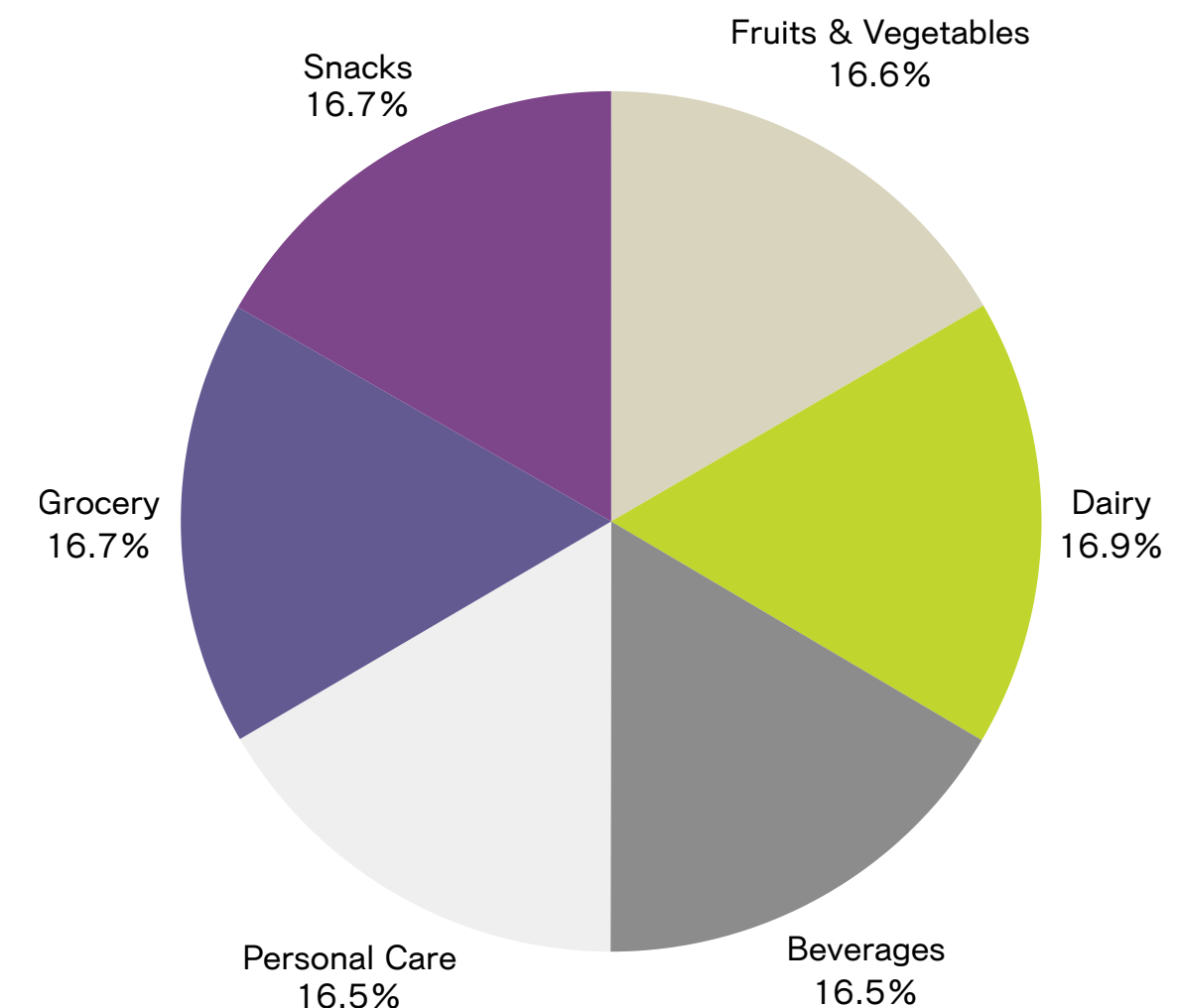
# DATA

---

Dataset about e-commerce grocery delivery services, focusing on Blinkit, Swiggy Instamart, and JioMart. It includes customer feedback, delivery times, service ratings, and various factors affecting delivery performance.

Source: Kaggle

```
_id: ObjectId('690a6f540535847d009a4642')  
Order ID : "ORD000001"  
Customer ID : "CUST2824"  
Platform : "JioMart"  
Order Date & Time : "19:29.5"  
Delivery Time (Minutes) : 30  
Product Category : "Fruits & Vegetables"  
Order Value (INR) : 382  
Customer Feedback : "Fast delivery, great service!"  
Service Rating : 5  
Delivery Delay : "No"  
Refund Requested : "No"
```



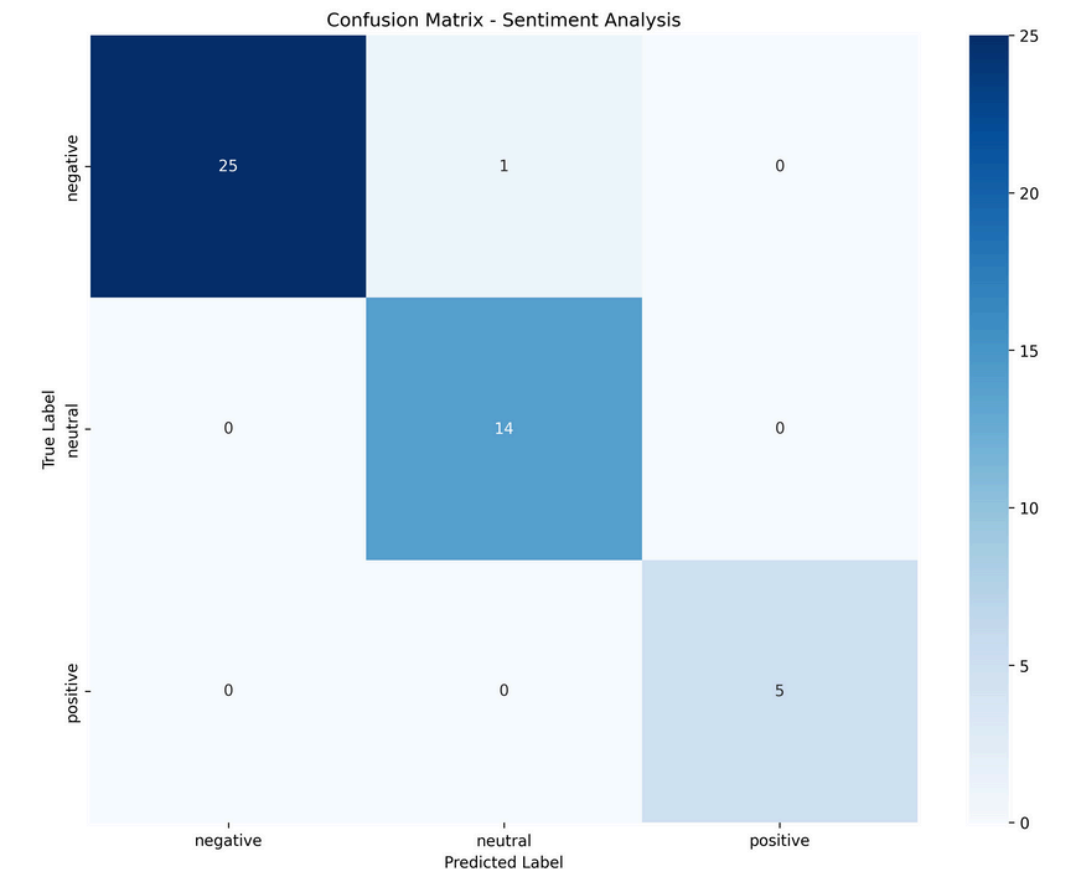
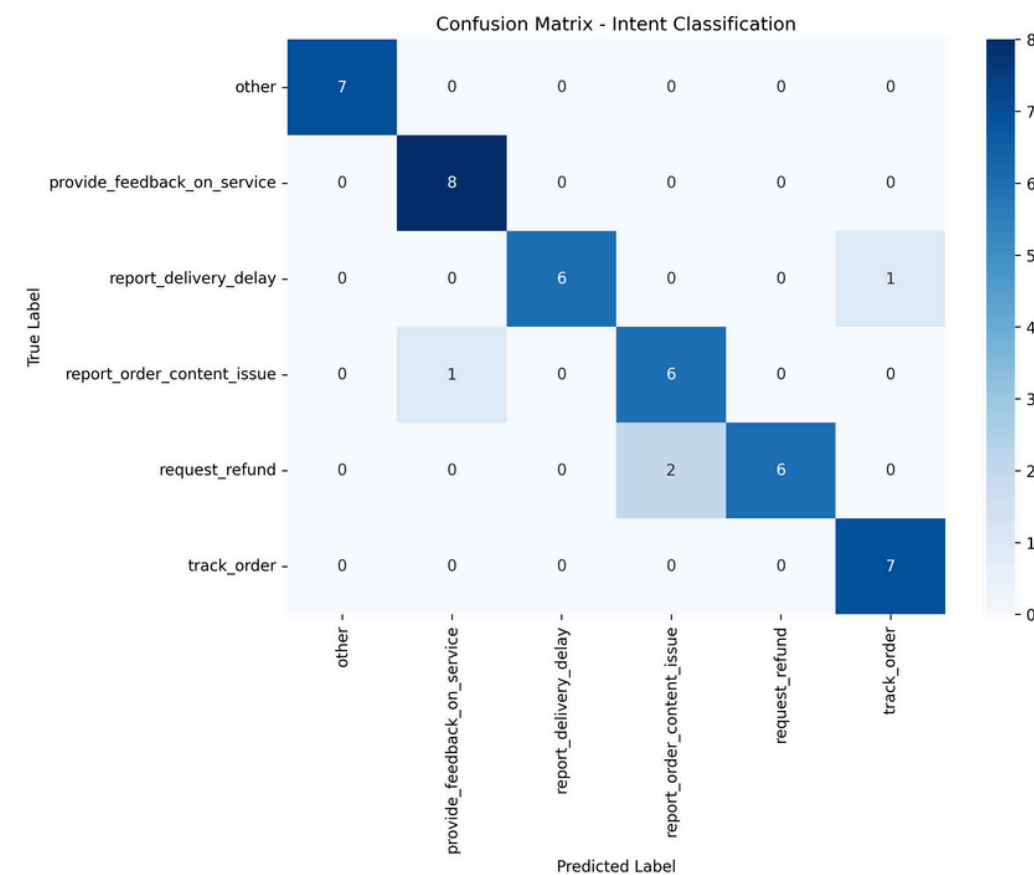
# NLU MODEL

## DISTILBERT (transformers library)

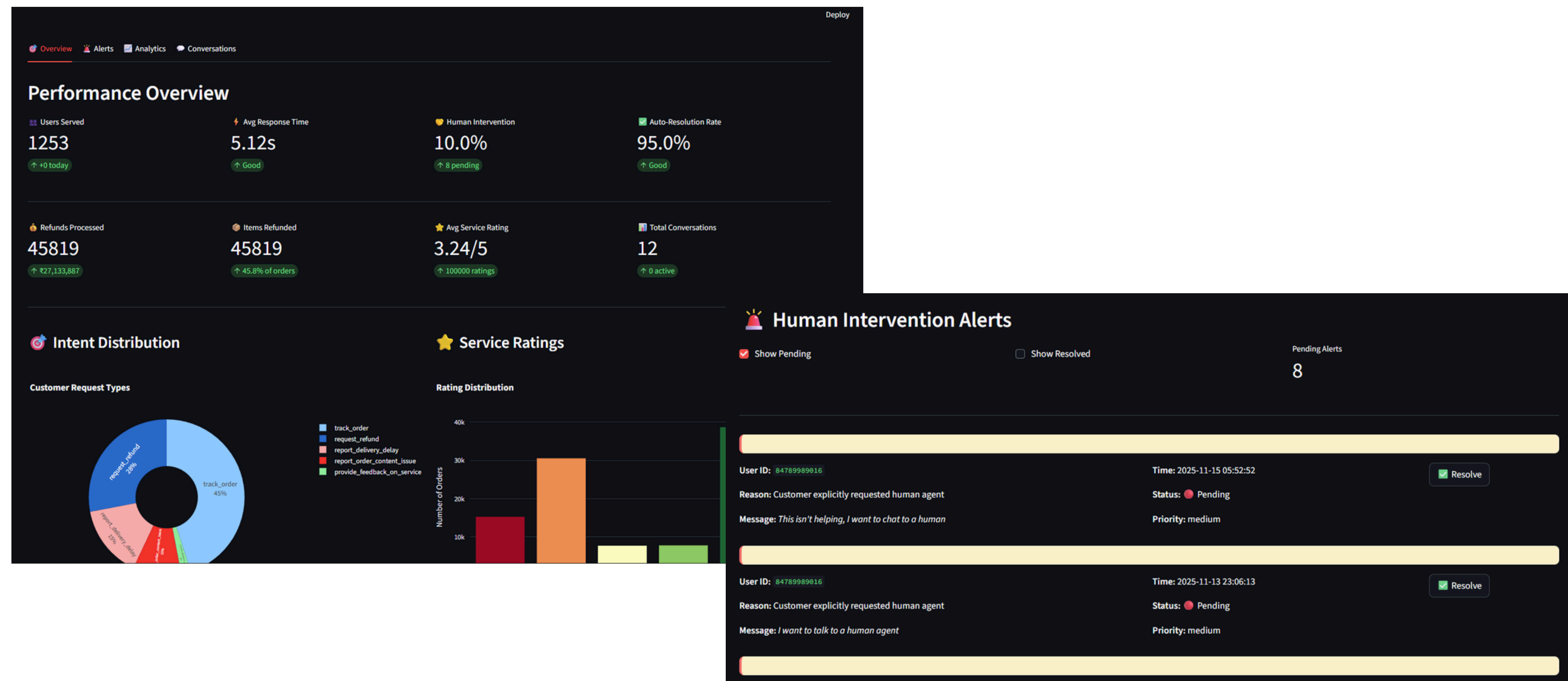
- Intent Accuracy: 88.89%
- Intent F1-Score: 0.8989
- Sentiment Accuracy: 97.78%
- Sentiment F1-Score: 0.9779
- Avg Intent Confidence: 0.9713
- Avg Sentiment Confidence: 0.9724

## HYPERPARAMETERS

- Epochs = 4
- Batch size = 16
- Learning rate =  $2e-5$
- Warmup steps = 1000
- Weight decay = 0.02



# DASHBOARD





# FUTURE DEVELOPMENTS

---

- Improve user experiences
  - Debounce functionality
  - Faster response time
  - Response to reactions, images
- Add more functionalities
  - Email notifications for human agents
  - Product database for Q&A
- Deep learning model
  - Automatically re-trains the NLU model on the new, human-verified data collected from the dashboard



# THANK YOU



<https://github.com/LeeMinNguyeen/E-com-Automated-Resolution.git>