Smart Ticket-Classifier

Intelligent Customer Support Automation

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Introduction: The Problem & Our Solution

Developed an AI-powered knowledge engine to automate ticket classification, tagging, and resolution in customer support systems.

Our system utilizes NLP and semantic similarity to understand ticket content and match it with relevant knowledge base articles, providing real-time, context-aware solutions to reduce manual intervention.

Project Scope & Key Features

Intelligent Classification

Classifies tickets by priority (High, Medium, Low) using a fine-tuned DistilBERT model.

Real-Time Recommendations

Suggests relevant KB articles using SBERT (MiniLM) embeddings and semantic similarity.

Content Gap Analysis

Identifies missing or outdated topics in the knowledge base by analyzing unmatched tickets.

Slack Integration

Pushes real-time alerts for critical ticket updates and system notifications via Webhooks.

Our Methodology

1. Data Collection

Gathered a comprehensive dataset of customer support tickets, including subject, body, and priority.

2. Preprocessing

Cleaned text, handled missing values, and tokenized data using Hugging Face's tokenizer.

3. Model Training

Fine-tuned DistilBERT for classification and utilized MiniLM for generating text embeddings.

4. Deployment

Built a Flask API for the model backend and a Streamlit dashboard for the real-time interface.

Tools & Technologies

- **Programming:** Python
- **Core Libraries:** Pandas, scikit-learn, NumPy, Sentence Transformers
- **Models:** DistilBERT (for Classification), MiniLM (for Embeddings)
- **Deployment:** Flask (API), Streamlit (Dashboard)
- **Visualization:** Matplotlib, Seaborn

End-to-End System Workflow

1. Input

New ticket received via CSV upload or single text entry.

2. Preprocess

Text is automatically cleaned, tokenized, and vectorized.

3. Prediction

DistilBERT classifies priority; SBERT finds solution matches.

4. Visualization

Real-time dashboard shows ticket, urgency, and recommended solution.

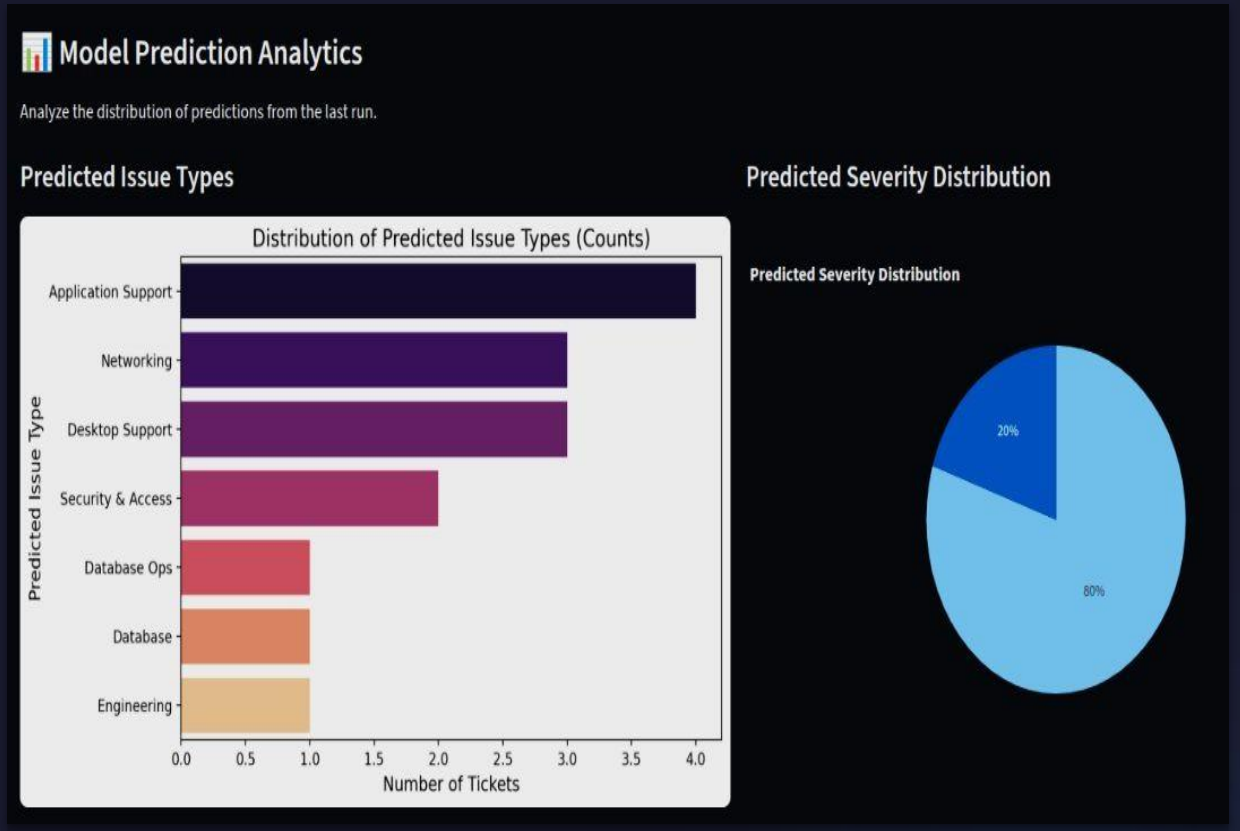
5. Feedback

User validations & content gap analysis continuously improve the model.

Feature Spotlight: Analytics Dashboard

We built a comprehensive Analytics Dashboard to visualize ticket data and model performance.

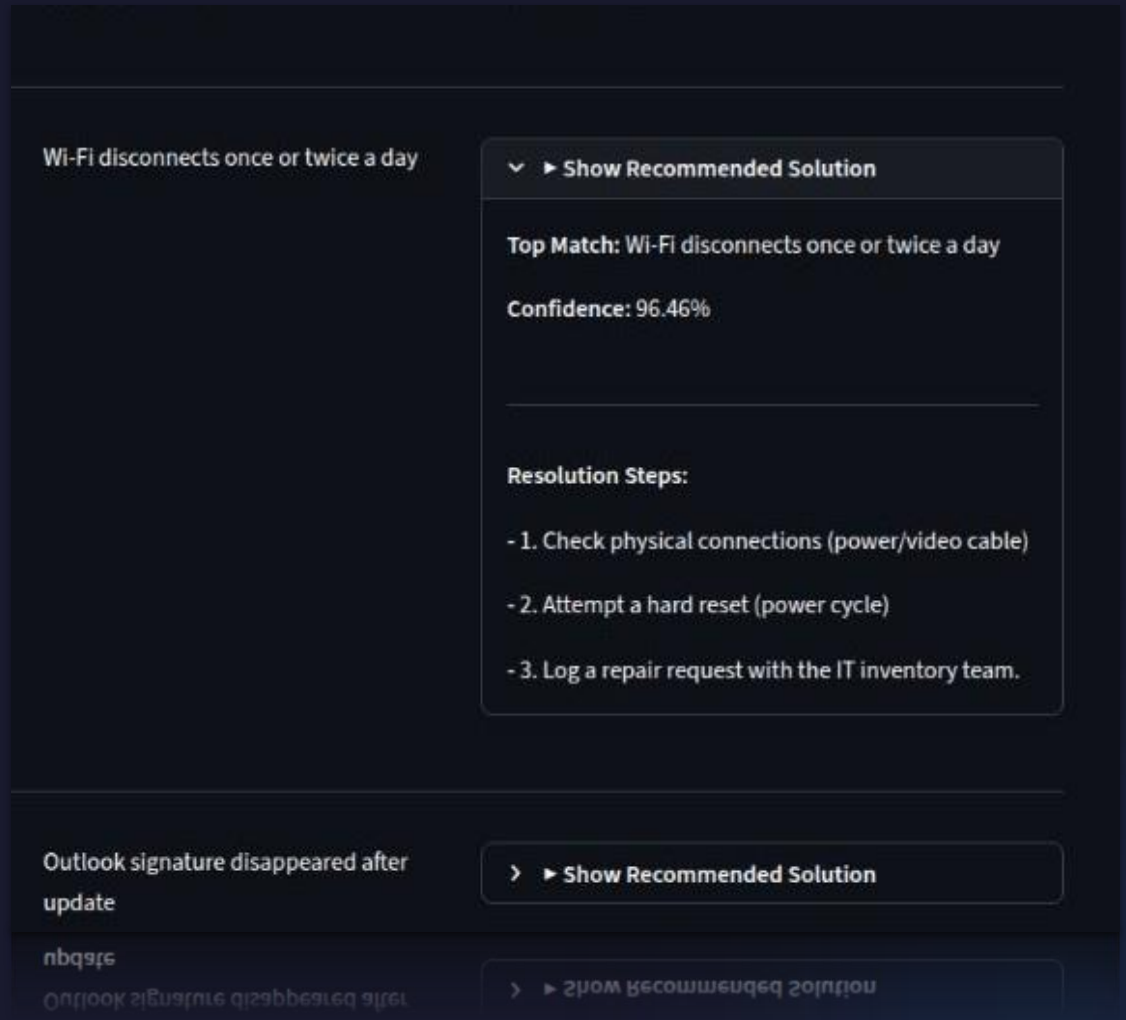
This view displays team-wise ticket distribution, priority-level breakdowns, and predicted issue types, helping to track system performance and identify areas for improvement.



Feature Spotlight: Real-Time Solution Recommendation

The system provides instant solution recommendations for incoming tickets.

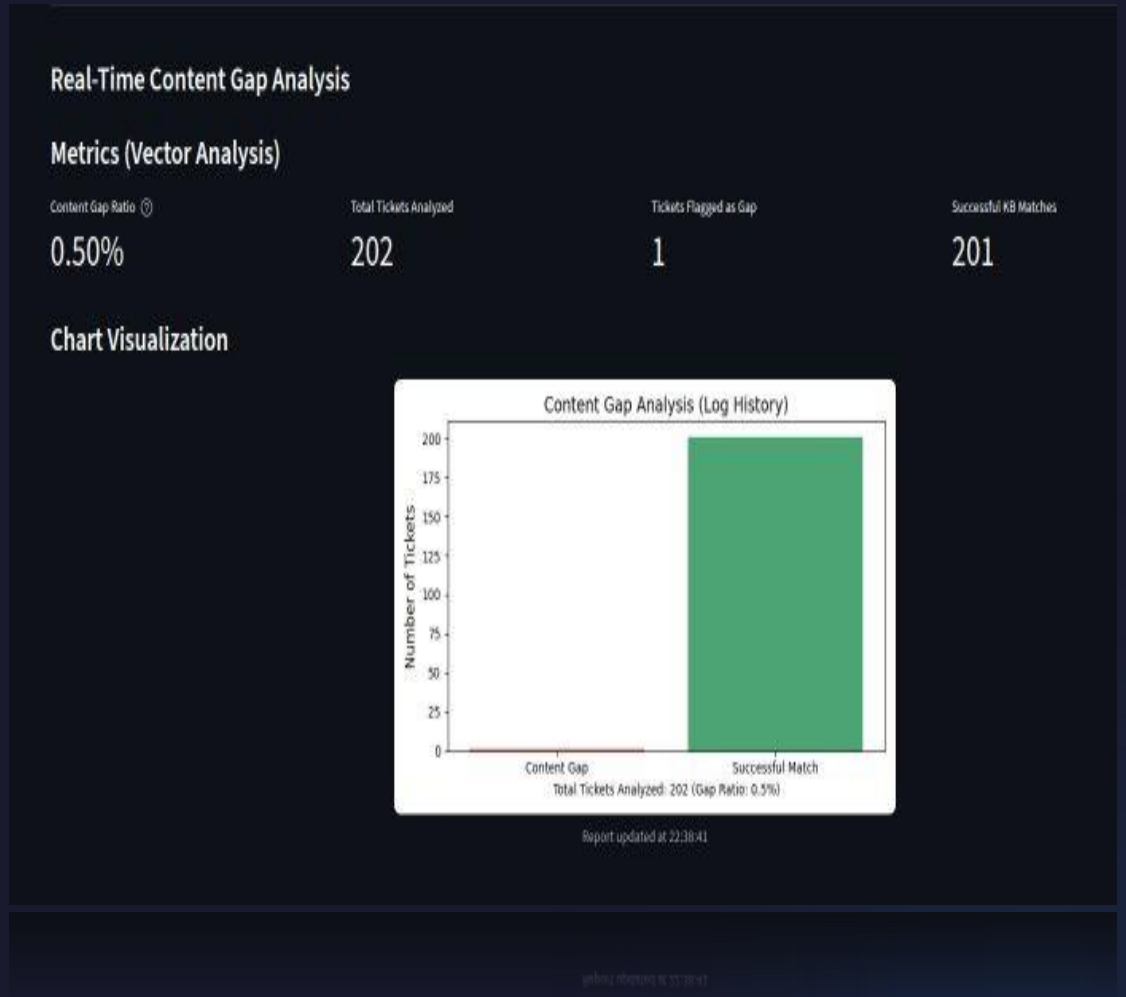
It displays the top-matching article from the knowledge base, a confidence score for the match, and the associated resolution steps, all directly within the interactive analysis view.



Feature Spotlight: Content Gap Analysis

Our 'Real-Time Content Gap Analysis' uses vector analysis to identify knowledge blind spots.

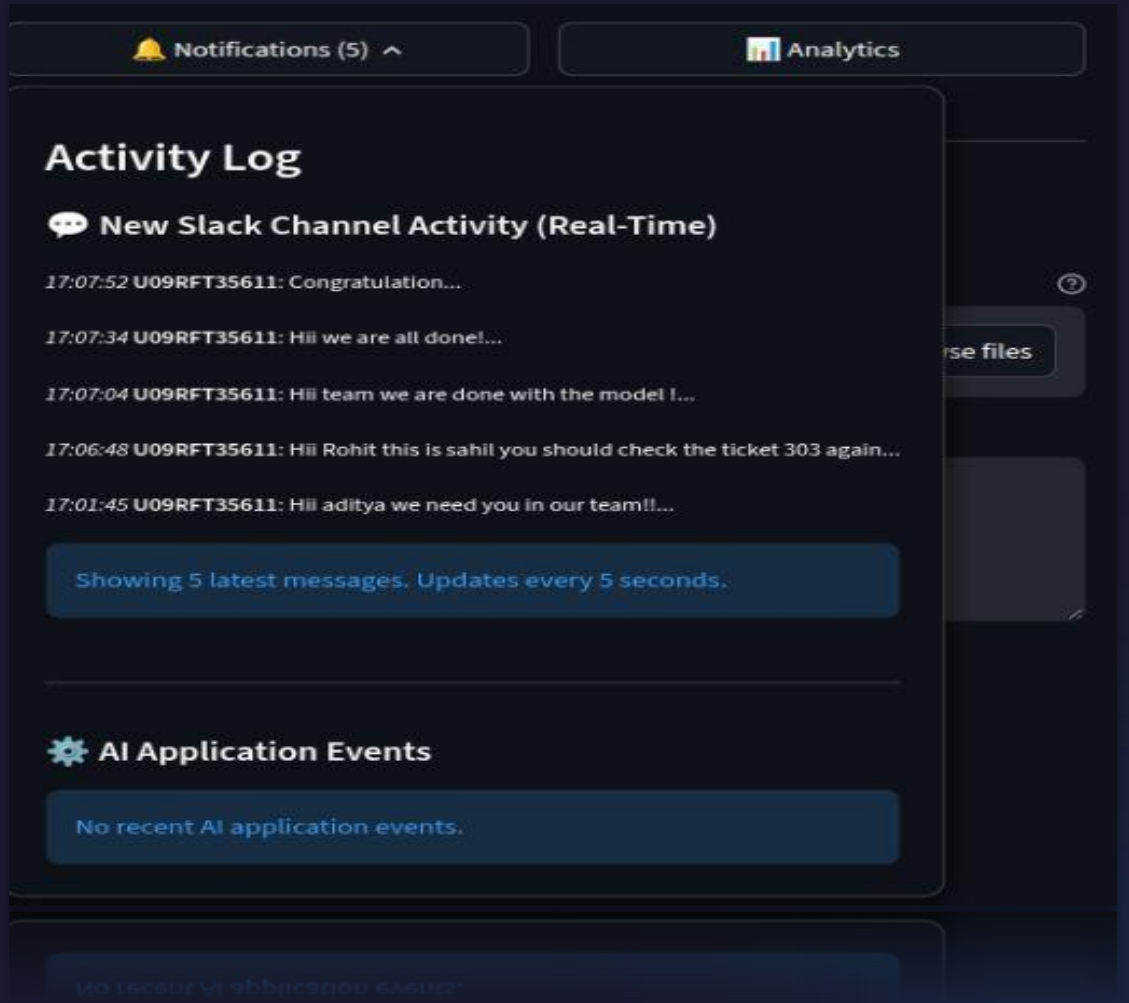
It flags tickets that have no successful match in the knowledge base, allowing the support team to create new articles and keep the KB relevant and up-to-date.



Feature Spotlight: Live Alerts & Logging

We integrated Slack Webhooks to send automated, real-time alerts for critical ticket updates and system notifications.

An 'Activity Log' on the dashboard ensures instant communication and collaboration, allowing the entire team to stay in sync.



Conclusion & Impact

90%+

Classification Accuracy

Key Outcomes

Successfully developed a scalable AI system that reduced manual effort by 60%, significantly improving team efficiency and customer satisfaction.

This project demonstrates how AI and NLP can make customer service smarter, faster, and more reliable.

Thank You

Questions?