ASAPP Hackathon

Team Speed ‘Speed Airbot’

23 October 2025

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Problem landscape - current scenario

The Airline Support Challenge : High Volume and Low Efficiency in a $4.8 Billion market

- Airlines handle **millions** of customer interactions daily across chat, calls, and emails.
- **Up to 65–70%** of these are **repetitive, rule-based requests** (e.g., flight status, refunds, cancellations).
- Despite existing self-service tools, **>60% of passengers** still prefer talking to human agents, citing lack of clarity and robotic responses.
- This creates **high operational costs, agent fatigue, and longer wait times.**

The pain points

❌ Inefficient manual resolution

Repetitive queries handled by agents

❌ Fragmented user experience

Bots fail to retain context or sound human

❌ Poor scalability

Customer spikes (flight delays, weather events) overwhelm systems

The Need

With global air travel back to pre-pandemic levels and digital-first engagement becoming standard, airlines face pressure to deliver instant, intelligent, and human-like support. Our solution bridges this gap with AI-native, policy-compliant conversational systems that blend automation and empathy.

To bridge this gap, our solution leverages ASAPP's data-driven roadmap to engineer an airline-grade conversational agent - one that's as intuitive as a human, yet as efficient as AI.

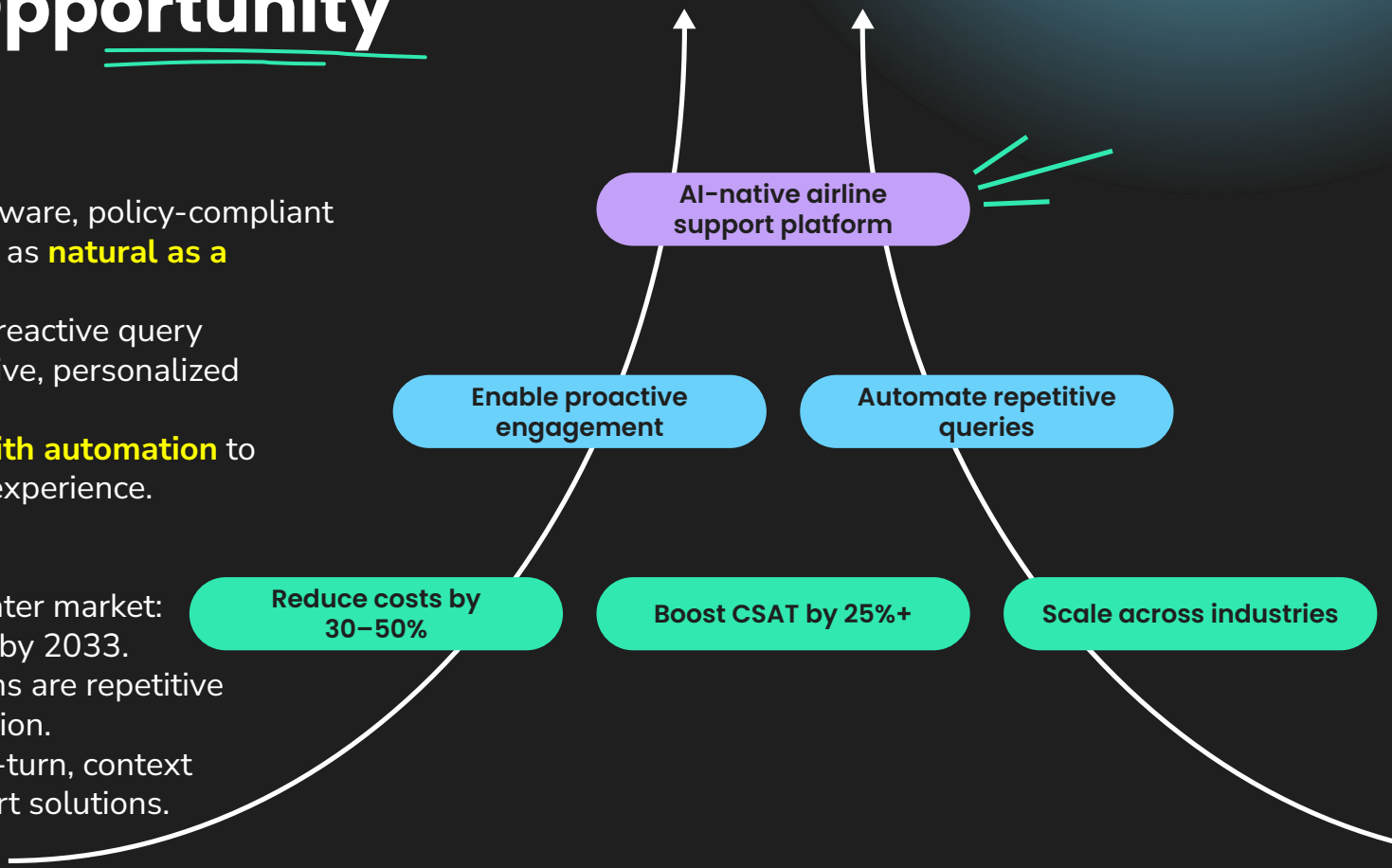
Vision & Opportunity

🧭 **Our Vision**

- Create a context-aware, policy-compliant AI agent that feels as **natural as a human**.
- Shift airlines from reactive query handling to proactive, personalized engagement.
- **Blend empathy with automation** to elevate customer experience.

💡 **Opportunity**

- Airline contact-center market: $4.8 B → $12.6 B by 2033.
- **70 %** of interactions are repetitive and fit for automation.
- **Huge gap** in multi-turn, context retaining AI support solutions.



Technical Roadmap : From Vision to Value

Using ASAPP's 'Vision to Value' roadmap as our foundation, we've structured our solution to mirror its data-driven, scalable, and customer-centric approach

1. **Target :** Identify automation-heavy airline use cases
2. **Setup :** Integrate easily into airline systems
3. **Test :** Scale & simulate conversations safely
4. **Supervise :** Ensure compliance & consistency
5. **Run & Optimize :** Continuous learning and refinement

Target : Intelligent Use Case Prioritization

- **Booking Changes / Cancellations** → structured data retrieval + transaction.
- **Refund & Policy Queries** → repetitive and rule-based.
- **Baggage Tracking / Complaints** → moderate complexity with high query volume.
- **Loyalty Program Enquiries** → low urgency, consistent data flow.

Setup : System Design and Integration

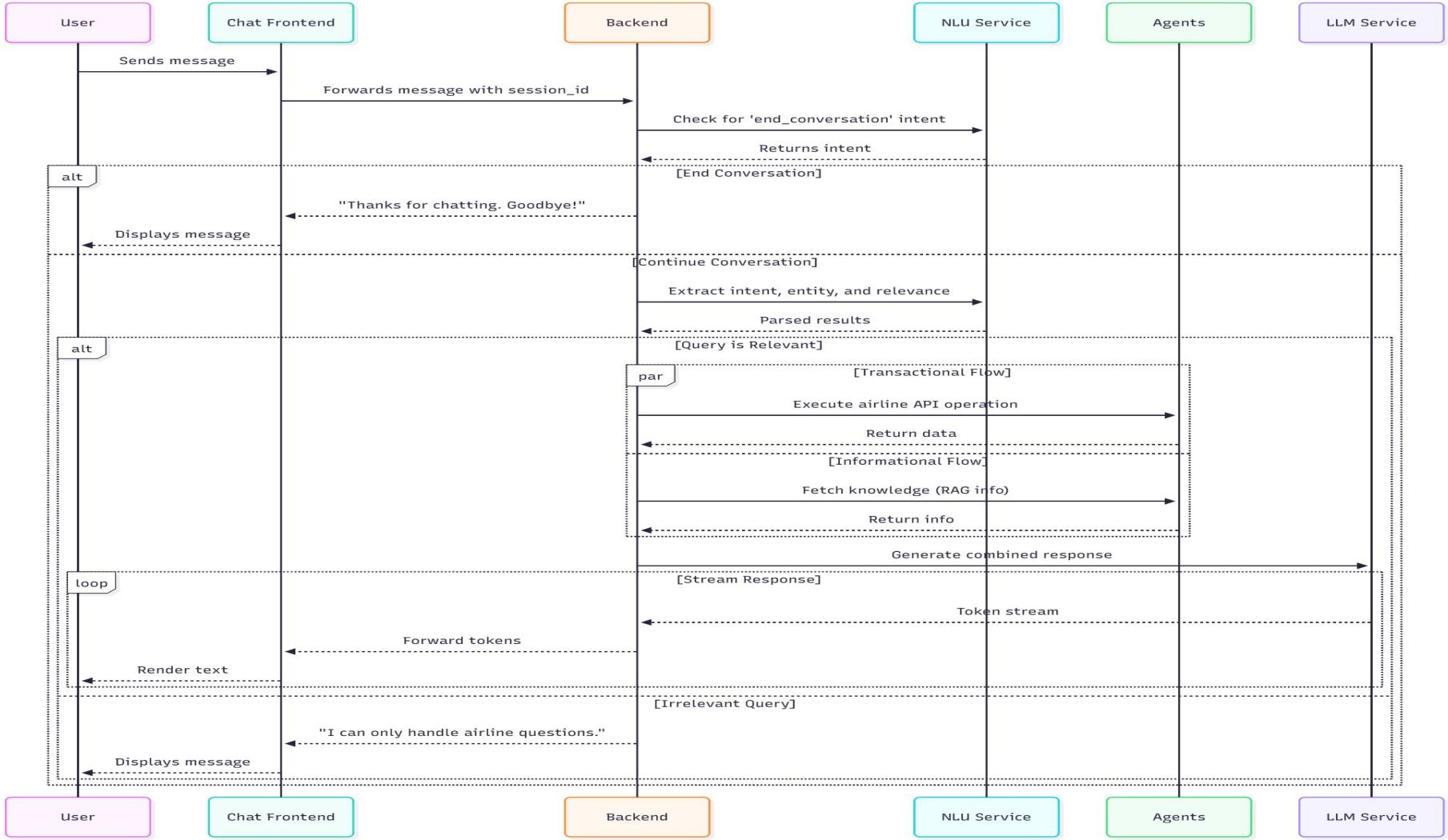
- **Agents (Core Intelligence):**
  - **Transactional Agent :** Executes API-based tasks (booking, refund, status).
  - **Informational Agent :** Handles FAQ, policy lookups, and document retrieval via a vector database.
  - Both use Relevance Scoring to pick the best response path.

- **Policy Module:**
  - Ensures airline-specific tone, compliance, and wording.
  - Filters off-topic or unsafe responses.

- **LLM Interface:**
  - Generates natural, human-like replies within airline domain boundaries.
  - Integrated via secure API with response.

- **Frontend Layer:**
  - Customer chat interface (web).
  - Handles message input and session start.

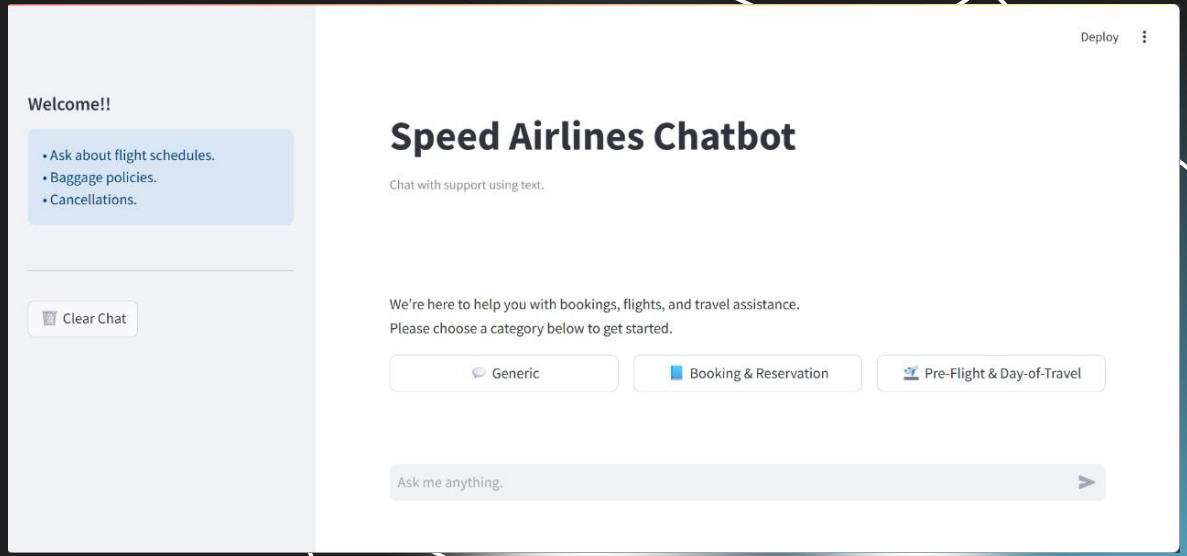
- **Backend (Core Engine):**
  - **Session Manager :** tracks user context, multi-turn conversation state.
  - **Redis Cache :** enables fast retrieval of previous turns and context memory.
  - **Intent Classifier + Context Manager :** processes incoming messages, predicts intent, and maintains continuity across queries.


User
Chat Frontend
Backend
NLU Service
Agents
LLM Service
Sends message
Forwards message with session_id
Check for 'end_conversation' intent
Returns intent
alt
[End Conversation]
"Thanks for chatting. Goodbye!"
Displays message
[Continue Conversation]
Extract intent, entity, and relevance
Parsed results
alt
[Query is Relevant]
par
[Transactional Flow]
Execute airline API operation
Return data
[Informational Flow]
Fetch knowledge (RAG info)
Return info
Generate combined response
loop
[Stream Response]
Token stream
Forward tokens
Render text
[Irrelevant Query]
"I can only handle airline questions."
Displays message
User
Chat Frontend
Backend
NLU Service
Agents
LLM Service

Test : Validation, Simulation & Quality Control

Key Testing Dimensions :

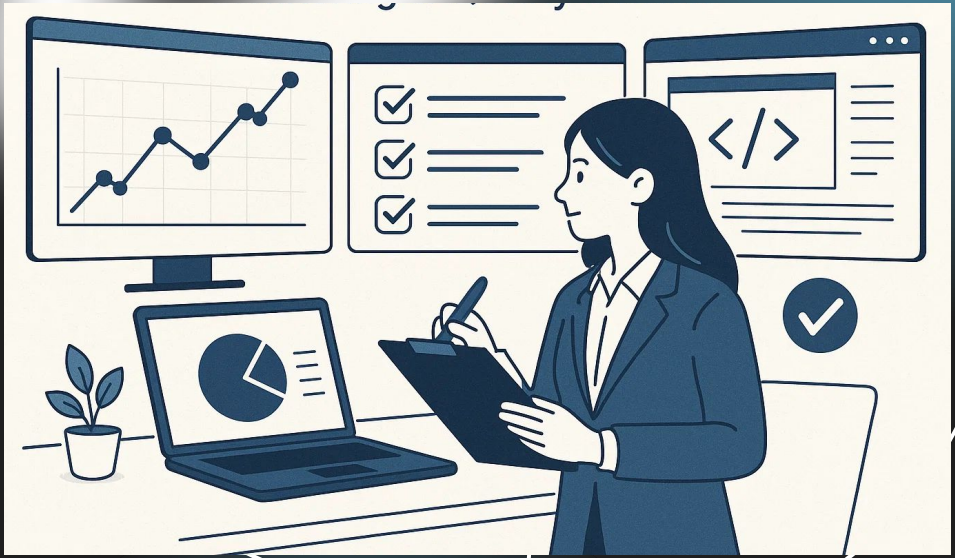
1. Intent Accuracy
2. Context Retention
3. Policy Adherence
4. Response Naturalness
5. Latency



Supervise : Monitoring & Quality Control

Goals we aim to achieve :

- Maintain **consistent response** quality across thousands of sessions.
- Detect and **flag policy violations** or off-topic responses in real time.
- Provide human oversight for **continuous** improvement and trust.



Scalability Beyond Airlines

Our modular architecture enables rapid adaptation across industries, transforming our airline support bot into a cross-sector conversational AI platform.

- Built with **domain-agnostic core modules** (session manager, NLU, policy engine).
- Industry-specific logic added via **plug-in intent models** and policy templates.
- Vector-based knowledge retrieval allows **easy retraining** with new datasets.
- API-first design supports **integration with any enterprise CRM or database**.

Industry	Example Use Case
Airlines	Flight rebooking, baggage queries, refund policy assistance
Telecom	Plan upgrades, outage reports, SIM activations
Banking	Card blocking, transaction queries, KYC assistance
Retail / e-commerce	Order tracking, returns, product availability
Logistics	Shipment tracking, delay updates, delivery rescheduling

Thank you!

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