

Generative AI agent ecosystem for passenger and employee service

Leading airline drove a digital transformation initiative using Generative Artificial Intelligence to strengthen passenger service and enhance the capabilities of its service agents. Together with Novacomp, an ecosystem of cognitive agents was developed, capable of understanding natural-language queries, accessing corporate knowledge, and generating accurate, context-aware responses — improving the customer experience and operational efficiency.

Industry: Aviation / Air Transport

*Image for illustrative purposes only

Project context

As part of its technology innovation strategy, a leading airline sought to implement intelligent agents to speed up passenger service and support decision-making for its phone-based agents. To achieve this, an ecosystem was developed consisting of Amaia Employees, Aerobot, Lupita, and a Knowledge Base Governance module responsible for managing the knowledge used by the AI models. These solutions enable natural-language query resolution, quick access to corporate information, and personalized recommendations backed by official documentation.

Key challenges

- Reducing the time service agents spend searching for information.
- Centralizing knowledge distributed across multiple documents and information sources.
- Incorporating Generative AI capabilities to understand natural-language queries.
- Generating accurate, consistent responses for passengers and employees.
- Supporting conversations with and without context to improve the user experience.
- Optimizing latency through intelligent caching mechanisms.
- Scaling responses to frequent inquiries without increasing the operational load on human agents.
- Guarantee correct and reliable responses (correctness), enhancing the precision of information delivered to passengers and staff

Approach

An architecture based on specialized cognitive agents powered by Generative Artificial Intelligence was designed and implemented.

Amaia Employees provides intelligent responses to phone agents, also displaying supporting documentary evidence through a document viewer connected to the Knowledge Base.	Aerobot handles customer queries through digital channels such as WhatsApp, understanding questions with and without context and escalating the conversation to a human agent when necessary.
Lupita offers intelligent recommendations for flights, vacation packages, car rentals, and complementary services within the eCommerce ecosystem.	As a cross-cutting component, Knowledge Base Governance centralizes the management of documents, business rules, and caching mechanisms used by all the AI agents.

Results

The implementation gave the leading airline a Generative AI ecosystem to improve service for passengers and employees through faster, more accurate, and context-aware responses.

Corporate knowledge was centralized, optimizing agents' access to information, improving response consistency, and establishing a scalable platform for incorporating new Generative AI use cases across the organization.

Technologies used

Language and frameworks: Python 3.11/3.13, FastAPI, LangChain, LangGraph, Strands Agents, SQLModel, AsyncPG.

AI services: Amazon Bedrock, Amazon Bedrock AgentCore, RAG (Retrieval-Augmented Generation) architecture, Generative AI Knowledge Base.

Frontend: React 19, Angular 19, Vite 7, Tailwind CSS, PrimeNG.

Persistence: Amazon DynamoDB, PostgreSQL 16, Amazon OpenSearch Serverless, Redis/MemoryDB.

Security: Auth0, Okta, and RSA encryption.

Infrastructure: Docker, Amazon EKS, Amazon S3, and deployments on ARM64 architecture.



Conclusion

The collaboration between the airline and Novacomp made it possible to implement an ecosystem of cognitive agents powered by Generative Artificial Intelligence that strengthens service for passengers and employees, centralizes organizational knowledge, and improves operational efficiency. The solution is a scalable platform, ready to evolve with new AI use cases, aligned with the airline's technology innovation strategy.

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