AI-powered contact center enhancement using Amazon Bedrock and Amazon Connect

Executive Summary

Nova developed an advanced AI-powered contact center solution for Diri Telecomunicaciones, a Mexican company that operates as a Mobile Virtual Network Operator (MVNO), to address critical customer service challenges. The solution leverages Amazon Bedrock Knowledge Bases, Amazon Connect, and Amazon Lex to provide intelligent customer support across voice and WhatsApp channels.

Leveraging generative AI and retrieval-augmented generation (RAG), the solution provides:

- Reduced Wait Times: From 43-80 minutes to almost immediate attention.
- Improved Resolution Speed: Faster query resolution.
- Enhanced Agent Productivity: AI-powered agent workspace widget.
- Multi-Brand Support: Customized interactions for Diri, Turbocel, and Pillofon brands.
- 24/7 Intelligent Support: Automated responses with seamless human handoff.

The serverless GenAI architecture transforms traditional contact center operations into an intelligent, scalable customer service platform that delivers exceptional customer experiences while optimizing operational efficiency.

The Challenge

Diri Telecomunicaciones, operating across Mexico, Colombia, and Peru with 37 contact center agents, faced significant operational bottlenecks in their customer support operations. The existing Amazon Connect infrastructure experienced severe performance issues that directly impacted customer satisfaction and operational efficiency.

Why AWS?

Nova recommended AWS for its comprehensive suite of AI services that could seamlessly integrate with Diri's existing Amazon Connect infrastructure.
By choosing AWS, Diri could enhance their existing investment while implementing cutting-edge AI capabilities without managing complex ML infrastructure.

About Costumer

Figure 1 – Nova Logo

Nova is a company specializing in Information Technology Consultancy Services.

"Innovate better, faster, smarter with Nova".

The Solution

Nova implemented a comprehensive AI-powered contact center enhancement that seamlessly integrates with Diri's existing Amazon Connect infrastructure, providing intelligent automation while preserving human touch for complex interactions.

Intelligent Customer Interaction Flow

The solution creates a sophisticated interaction pathway that begins when customers contact support via voice or WhatsApp channels through Amazon Connect. The system employs Amazon Lex as an intelligent intermediary, processing customer messages and routing them to a specialized AWS Lambda function powered by the Strands Agent SDK.

This Lambda function serves as the core intelligence engine, implementing advanced natural language processing to determine appropriate actions including simple answer generation using configured LLMs, tool execution for customer validation, and knowledge base retrieval for complex query resolution. The system maintains brand-specific customization through distinct system prompts for each Diri brand (Diri, Turbocel, and Pillofon), ensuring personalized customer experiences.

Advanced Knowledge Base Architecture

The solution leverages Amazon Bedrock Knowledge Bases configured with S3 data sources and OpenSearch Serverless as the vector store. This architecture enables rapid retrieval of relevant information through semantic search capabilities, supporting both customer-facing automated responses and agent-assisted queries.

The knowledge base processes multimodal content including text documents, images, and structured data, providing comprehensive support across diverse customer inquiry types.

Intelligent Escalation and Sentiment Analysis

A critical capability of the solution is its advanced sentiment detection and escalation logic. The Strands Agent Lambda continuously monitors customer interactions, identifying frustration, anger, or explicit requests for human assistance. When escalation criteria are met, the system seamlessly transfers customers to the human agent queue.

This intelligent routing ensures that complex issues requiring human empathy and problem-solving skills are handled by experienced agents, while routine queries are resolved through AI automation.

Agent Workspace Enhancement

For human agents, Nova developed a specialized widget integrated directly into Amazon Connect's Agent Workspace. This widget provides real-time AI assistance through a separate knowledge base optimized for internal agent queries.

Agents can input queries directly into the widget, receiving instant AI-powered responses that accelerate problem resolution while maintaining service quality.

"Amazon Bedrock."

By leveraging Amazon Bedrock's advanced GenAI capabilities and fully managed infrastructure, Nova's team was able to focus on delivering exceptional customer experiences while maintaining strict quality, security, and governance standards across multiple telecommunications brands.

Figure 2 – Amazon Bedrock Service

Best Features

- **Intelligent Brand Customization**

- **Dual Knowledge Architecture**

- **Seamless Integration**

- **Multi-Channel Support**
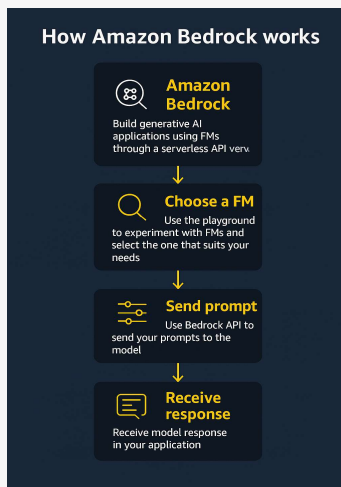
- **Real-Time Agent Assistance**

How Amazon Bedrock works

Amazon Bedrock
Build generative AI applications using FMs through a serverless API serv...

↓

Choose a FM
Use the playground to experiment with FMs and select the one that suits your needs

↓

Send prompt
Use Bedrock API to send your prompts to the model

↓

Receive response
Receive model response in your application

Figure 3 - How Amazon Bedrock works

Results and Benefits

Performance Improvements

The implementation has delivered transformative results across all key performance indicators. Customer wait times have been reduced from the previous 43-80 minute range to almost immediate responses, representing a great improvement in accessibility. Query resolution speed has increased with routine inquiries now resolved in real-time through AI automation.

The intelligent escalation system ensures that only complex situations requiring human intervention reach agents, optimizing resource allocation and allowing agents to focus on high-value customer interactions that require empathy, creativity, and complex problem-solving skills.

Enhanced Customer Experience

The multi-brand customization capability allows the solution to provide tailored interactions that reflect each brand's unique personality and service approach. This functionality helps maintain brand consistency while leveraging advanced AI capabilities, ensuring customers of Diri, Turbocel and Pillofon receive contextually appropriate responses that align with their expectations and brand experience.

The 24/7 availability of intelligent support allows providing customers with immediate assistance regardless of time zones across Mexico, Colombia, and Peru operations.

Operational Excellence

Agent productivity has increased substantially through the workspace widget, which provides instant access to comprehensive knowledge base information. Agents can now resolve customer inquiries more efficiently while maintaining high service quality standards.
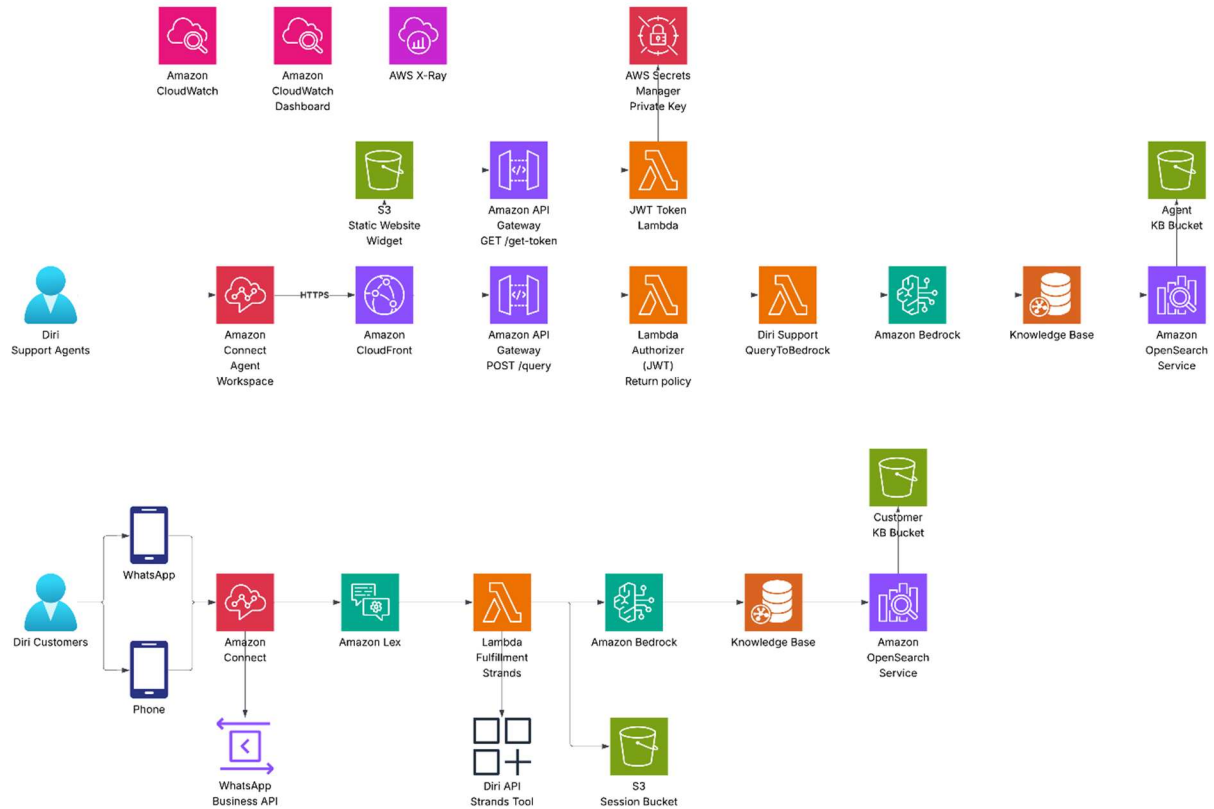
The serverless architecture has delivered significant cost optimization by automatically scaling resources based on demand, eliminating over-provisioning while ensuring performance during peak usage periods.

Technology Innovation Leadership

The solution positions Diri as a technology leader in the telecommunications industry, demonstrating innovative use of AI to enhance customer service while maintaining the human connection that defines exceptional support experiences.

The modular architecture provides a foundation for possible future enhancements including advanced analytics, predictive customer service, and expanded AI capabilities as foundation models continue to evolve.

Diri AI-powered contact center solution architecture

Amazon CloudWatch

Amazon CloudWatch Dashboard

AWS X-Ray

AWS Secrets Manager Private Key

S3 Static Website Widget

Amazon API Gateway GET /get-token

JWT Token Lambda

Agent KB Bucket

Diri Support Agents

Amazon Connect Agent Workspace

HTTPS

Amazon CloudFront

Amazon API Gateway POST /query

Lambda Authorizer (JWT) Return policy

Diri Support QueryToBedrock

Amazon Bedrock

Knowledge Base

Amazon OpenSearch Service

WhatsApp

Phone

Diri Customers

Amazon Connect

Amazon Lex

Lambda Fulfillment Strands

Amazon Bedrock

Knowledge Base

Customer KB Bucket

Amazon OpenSearch Service

WhatsApp Business API

Diri API Strands Tool

S3 Session Bucket

Next Steps

As Diri, Turbocel and Pillofon maintain unique approaches to interacting with the customer, the next phase focuses on refining system prompts for each brand to integrate the business logic required to ensure that AI responses perfectly capture each brand's unique customer interaction style. Additionally, adding new brands as they emerge and implementing continuous knowledge base updates to incorporate new service plans, promotional offers, and any kind of new information, ensuring that customer support capabilities remain current and comprehensive across all the brands.

AI-Powered Automation

The solution leverages Amazon Bedrock's foundation models and Amazon Connect's contact flows to automatically handle customer inquiries, reducing the long 43-80 minutes wait times.

Intelligent Escalation

Advanced sentiment detection and customer intent analysis ensures seamless handoff to human agents when complex issues require personal attention and empathy.
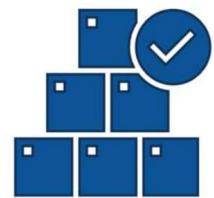
Serverless Scalability

The AWS serverless architecture provides cost-effective, event-driven processing that scales automatically with call volumes while maintaining consistent performance.

About Nova

Nova is a company specializing in Information Technology Consultancy Services. All our team members have one thing in common: our enthusiasm for technology and our passion for customer service excellence. We provide services in all North America, LATAM and Europe. Our headquarters are in NYC metropolitan area, and we also have offices in Guadalajara, Mexico and Madrid, Spain.