

# ARIE Chatbot – Technical Explanation

## How Does It Work?

When you ask ARIE a question, several things happen quickly in the background to generate a well-informed response. Here's how it works, step by step:

### 1. The Request Goes Through Amazon API Gateway

The **Amazon API Gateway** acts like a front desk or receptionist. It receives your question and routes it to the correct part of the system that can help. It makes sure your message is handled properly, securely, and efficiently.

### 2. A Lambda Function Processes Your Question

A Lambda function is a small bit of code that runs only when it's needed. You can think of it like flipping on a light switch when you walk into a room, in that you turn it on when you need it, but then you turn it off when it's no longer needed. It decides whether your question can be answered quickly or requires a more detailed, multi-step process. Then, it gets started.

### 3. ARIE Searches Its Knowledge Base

The Knowledge Base is ARIE's internal library. It contains verified, trustworthy documents such as academic articles, reports, and institutional guidelines. Instead of guessing, ARIE looks through this digital library to find the best available information for your question.

### 4. OpenSearch Helps Find Relevant Information

**OpenSearch** is ARIE's internal search engine. It helps the chatbot scan the knowledge base, quickly identify relevant content, and collect information that will help build an accurate answer.

### 5. Amazon Bedrock Powers the AI's Thinking

**Amazon Bedrock** is the platform that gives ARIE access to advanced AI technology. This is how ARIE is able to:

- Understand complex language
- Generate clear, thoughtful answers
- Adapt its tone to different topics
- Include citations when appropriate

It's essentially the AI's "brain," helping it form high-quality responses.

## 6. A “Supervisor” Double-Checks the Answer

Some questions are more complex and require extra steps. That’s where the “Supervisor” comes in. The “Supervisor” is a second AI system that reviews the answer before it’s sent back to you. If it finds the response incomplete or unclear, it tells the system to try again or improve the explanation. This ensures the final answer is helpful and high-quality.

## 7. You Receive a Complete, Cited Answer

Once the AI agent and the Supervisor agree the answer is ready, it’s sent back to you, clearly written, easy to understand, and often with citations showing where the information came from.

## Supporting Features

ARIE is designed to stay accurate, reliable, and easy to maintain. Here are a few things that help:

- **Change logs:** Developers track updates and improvements to the system regularly.
- **Prompt templates:** These help the AI know how to speak politely, cite sources, and handle uncertain questions.
- **Automated testing:** ARIE is checked regularly to make sure it doesn’t break or give incorrect responses.
- **Modular design:** Different parts of ARIE handle different tasks, making it easy to grow and improve over time.

## In Summary

ARIE is a trusted digital assistant that:

- Listens carefully to your question
- Searches a curated, academic-grade library
- Uses powerful AI to think and write
- Double-checks its answers for clarity
- Returns helpful, well-sourced information

All of this happens in seconds, powered by secure and scalable cloud tools from **Amazon Web Services**. However, for users, it feels like getting help from a friendly and well-informed assistant.