

# E-Commerce Returns & Exchange ChatBoT

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## Dataset Understanding

### Order ID

Purpose: Uniquely identifies each transaction.

Use in Chatbot: Allows the chatbot to fetch specific order details quickly. When a customer initiates a return or exchange request, the bot can ask for the Order ID to verify the purchase and streamline the process.

Automation Potential: Enables integration with backend systems to automate order lookups, status checks, and eligibility validation.

### Customer Name

Purpose: Personalizes the chatbot interaction.

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Use in Chatbot: Helps create a friendly and personalized experience by addressing the customer by name. Additionally, it can assist in searching for orders if the Order ID is not available.

## **Order Date**

**Note: The order date is currently used as “Delivered Date” despite the status of the order.**

Purpose: Helps verify if the order is within the return/exchange window.

Use in Chatbot: Automatically assess eligibility based on the store's return policy (e.g., 30-day return window from the ordered date in this case, which is also treated as delivered date for demonstration purposes). The chatbot can guide the customer accordingly if the return window has closed.

## **Status**

Purpose: Indicates whether the order is delivered, processing, shipping etc.

Use in Chatbot: The bot can validate if a return or exchange is allowed. For example, if the status is "Processing," the bot could offer to modify the order instead of processing a return.

Automation Potential: Automatically filter out ineligible requests (e.g., canceled orders cannot be returned).

## **Payment Method**

Purpose: Important for processing refunds.

Use in Chatbot: Tailors refund options based on the payment method (e.g., refunds to the original credit card, store credit, or cash on delivery). The chatbot can also handle queries related to processing times for different payment methods.

## **Final Sale**

Purpose: Indicates whether an item is eligible for return or exchange.

Use in Chatbot: Automatically restricts return/exchange options if the item is marked as a "Final Sale." The chatbot can explain the policy and suggest alternative solutions like store credit if possible.

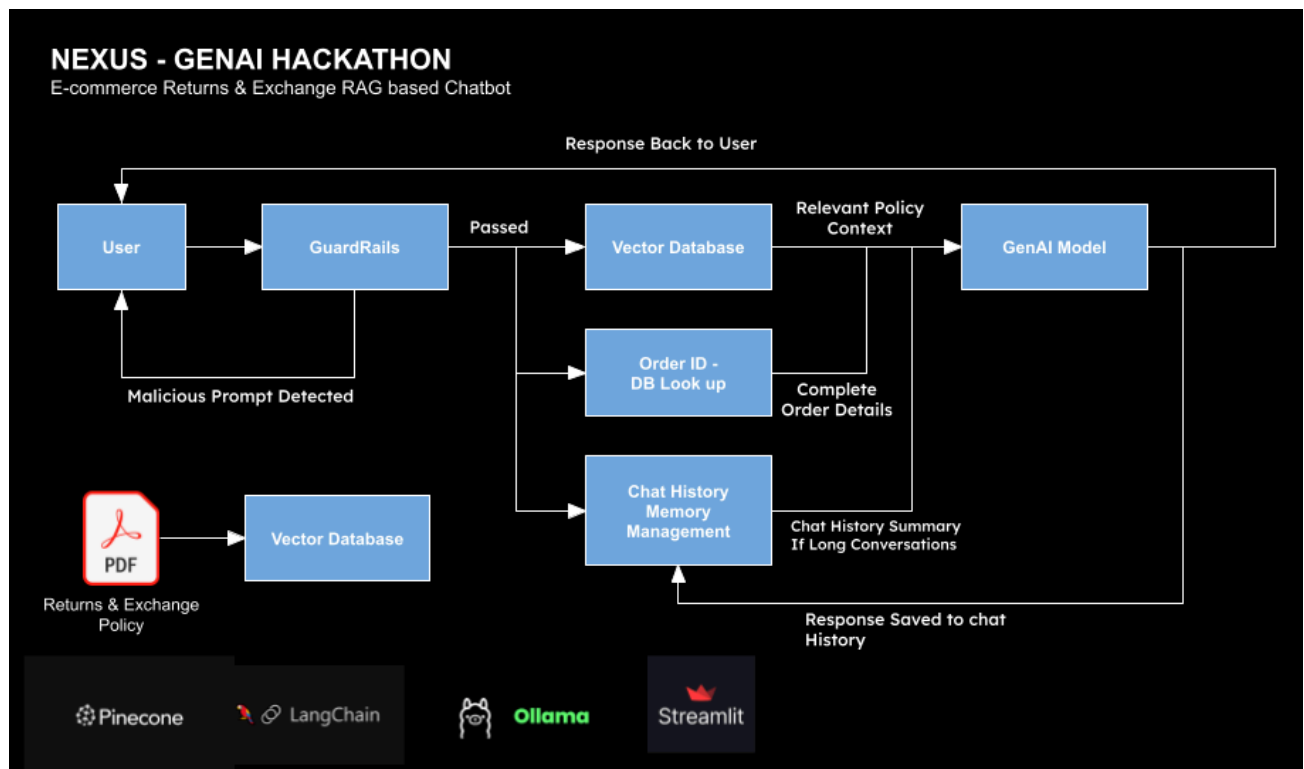
All other details are used for personalisation of the message. The exchange/return discussion may vary depending on various factors, like size, quantity etc. However, that is not currently within the scope of this final output.

### **How the Chatbot Can Use This Data:**

**Eligibility Check:** Validate if an item is eligible for return/exchange by checking the status, order date, and final sale status.

**Personalization:** Use customer name and order history to provide a tailored experience. The chatbot can also use this detail to obtain other information from the database to cross reference with the provided policy document to design tailored responses.

## Solution Architecture



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## Libraries Used

### 1. langchain\_core

**Modular AI Workflows:** Unlike traditional LLM (Large Language Model) libraries, langchain\_core offers modular building blocks for creating complex, multi-step workflows with LLMs. It simplifies chaining prompts, memory management, and tool integration.

**Advanced Memory Management:** Provides persistent memory and session handling, which is not as seamless with direct API usage or simpler frameworks.

**Agent & Tooling Integration:** Built-in support for agents that can interact with external tools, making it ideal for dynamic and interactive AI applications without manually coding these connections.

### 2. streamlit

**Rapid Prototyping:** Allows developers to create interactive data applications and dashboards with minimal code, much faster than alternatives like Flask + React or Dash.

**Built-In Interactivity:** Offers native support for widgets and dynamic visualizations, avoiding the need for custom JavaScript or front-end frameworks.

**Automatic UI Generation:** Automatically reruns and refreshes the app on code changes, which is more intuitive than traditional web app frameworks where manual server restarts are needed.

### 3. langchain\_community

**Community-Driven Extensions:** Offers a collection of community-created tools and integrations that can fill gaps in the core langchain library. This is a significant advantage over more closed ecosystems where custom integrations require more development effort.

**Faster Innovation:** The community often contributes experimental and niche features faster than official releases, providing early access to new tools and ideas.

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Support & Collaboration: Leveraging a strong community can provide faster problem-solving and more diverse perspectives compared to relying solely on official documentation.

#### **4. pinecone**

Purpose-Built for Vector Search: Pinecone is optimized for vector embeddings and semantic search, providing faster and more accurate search capabilities compared to general-purpose databases like Elasticsearch or traditional SQL databases.

Scalability and Performance: Manages large-scale vector data with efficient indexing and querying, making it ideal for recommendation systems and NLP applications.

Managed Service: Eliminates the complexity of setting up and managing infrastructure, unlike open-source alternatives where maintenance and scaling can become burdensome.

#### **5. gcloud (Google Cloud SDK) (Pinecone Dependency)**

Provides tools for interacting with the full range of Google Cloud services, from AI tools and databases to serverless functions and Kubernetes clusters.

#### **6. Google-api-python-client (Pinecone Dependency)**

Provides stable and well-maintained Python bindings for nearly all Google APIs, which ensures better compatibility and support than unofficial libraries.

#### **7. Grpcio (Pinecone Dependency)**

Offers low-latency and high-throughput RPC (Remote Procedure Call) services, often outperforming REST APIs in real-time applications.

#### **8. Grpcio-tools (Pinecone Dependency)**

Simplifies generating client and server code from Protocol Buffer (.proto) files, avoiding the need to write boilerplate code.

#### **9. ollama**

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Local LLM Management: Unlike cloud-based alternatives, Ollama focuses on running large language models locally, providing better data privacy and avoiding API costs.

Offline Capabilities: Enables model inference without internet access, which is a critical advantage for applications in isolated or secure environments.

**Libraries with respect to Guardrails are yet to be finalised.**

## **Example Outputs As on March 5th 2025**

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## Chat History Memory

### The bot remembers the info from previous conversations: Example illustrations

Example 1:



Hi My name is Daniel, I would like to return my order.



Hello Daniel,

I'd be happy to assist you with returning your order. To proceed with the return process, could you please provide me with your Order ID from your recent order confirmation email or chat history? This will help us locate your order and initiate the refund process efficiently.

Additionally, is there a specific reason for the return (e.g., product not as described, damaged, or no longer needed)?



My order id is 52001. Can this be processed?



Hello Daniel Lee,

Unfortunately, I have to inform you that due to the product being marked as 'Final Sale', it is strictly not eligible for exchange, return, or refunds. As per our Refund Policy, products sold as Final Sale are non-returnable.

However, if your reason for returning the order was due to a manufacturing defect or an error on our part, we may consider an exception in this case. But please note that shipping costs would still be non-refundable.

If you have any further questions or concerns, please feel free to ask.

Best regards, [Your Chatbot Assistant]

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Example 2:

## E-Commerce service desk

Ask me your queries related to your order.

My Order ID is 90284. Can this be processed?



Hi I am Emma, I would like to exchange my order.



Hello Emma, thank you for reaching out to us regarding your order exchange.

To start the process, could you please provide me with your Order ID so I can look into your specific case? Additionally, which product would you like to exchange for a different one? This will help me assist you more efficiently.

Also, just to confirm, I'd like to reiterate our Refund Policy: we issue refunds to the original payment method. If the original payment method is no longer available, store credit will be issued. Please let me know how you would like to proceed with the exchange, and I'll guide you through the next steps.



My Order ID is 90284. Can this be processed?



Dear Emma,

Thank you for reaching out to us regarding your Order ID 90284. I apologize for any inconvenience, but according to our return and exchange policy, orders that have been delivered are strictly not eligible for returns or exchanges.

As per our Refund Policy, refunds will be issued to the original payment method, and shipping costs are non-refundable unless the return is due to a manufacturing defect or an error on our part.

I've checked your order status, and it has been 46 days since purchase, which means it's no longer eligible for a return or exchange under our policy.

Unfortunately, this means that we won't be able to process your request at this time. However, I can help you with any other questions or concerns you may have regarding your order.

Best regards, [Your Assistant]



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Example 3:

## E-Commerce service desk

Ask me your queries related to your order.

Whats my name?



Hi, my name is mike.



Hello Mike, thank you for reaching out to us about returning an item. I'd be happy to assist you with your refund or exchange.

To get started, could you please provide me with the order number and details of the product you would like to return? This will help me look up the relevant information in our system and guide you through the process.



Whats my name?



Hello Mike, I apologize for not having that information on record earlier. You mentioned your name as "Mike" when we first started this conversation.

To get back to assisting you with your return, could you please provide me with the order number and details of the product you would like to return? This will help me look up the relevant information in our system and guide you through the process.

## Queries with Order ID

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## Case 1: The Order ID 89694 is a final sale product.

Ask me your queries related to your order.

I would like to initiate return and refund for my order id 89694, may I know what is the procedure?



I would like to initiate return and refund for my order id 89694, may I know what is the procedure?



Dear Noah Lewis,

Thank you for reaching out to us regarding your order ID 89694. However, I regret to inform you that since the product you've purchased, High-Top Sneakers, is a Final Sale, it's strictly not eligible for exchange, return, or refunds.

Our Refund Policy clearly states that we do not offer returns or exchanges for Final Sale items. We strive to provide accurate information about our products, and this status was clearly mentioned at checkout.

If you have any further questions or concerns regarding your order, please don't hesitate to ask.

## Case 2: The Order ID 52001 is a final sale product.



My order id 52001, I would like to initiate return and refund for the same.



I regret to inform you that due to the 'Final Sale' status of your order, it is not eligible for return or exchange. As per our Refund Policy, items marked as Final Sale are strictly non-returnable and non-exchangeable.

However, I can assist you with any further questions or concerns regarding your order. If there's anything else I can help you with, please let me know.

## Case 3: The Order ID 50570 is beyond 30 days but still in processing status



My order id 50570, I would like to initiate return and refund for the same.



Thank you for reaching out to us regarding your order ID 50570. I've checked on the status of your order, and it's currently in the Processing stage.

However, I regret to inform you that, as per our return policy, items ordered are not eligible for return or exchange after 30 days from purchase date. Unfortunately, this means that your order is no longer eligible for a return or exchange.

If you have any further questions or concerns, please let me know, and I'll be happy to assist you.

#### **Case 4: The Order ID is 90284 and is beyond 30 days and in delivered status**



My order id 90284, I would like to initiate return and refund for the same.



Dear Emma,

Thank you for reaching out to us regarding your order ID 90284. I'm sorry to inform you that your request to initiate return and refund for the Heeled Loafers is not possible as per our policy.

As per our Refund Policy, items are strictly NOT eligible for return or exchange if they have been more than 7 days past their delivery date. Since it has been 44 days since your purchase, unfortunately, this means that we cannot process a return or refund for the Heeled Loafers at this time.

If you have any further questions or concerns, please don't hesitate to ask. We appreciate your understanding in this matter.

Best regards, [Your Name]

#### **Case 5: The order ID 39824 is eligible for return and refund**



My order id 39824, I would like to initiate return and refund for the same.



Hello Charlotte,

Thank you for reaching out to us regarding your order #39824. I'm happy to assist you with initiating a return and refund.

To proceed with the return, please ensure that the item is in its original condition with all tags attached. You have 7 days from delivery within which you can initiate the return process.

Since it's within the eligible timeframe for return or exchange, we'll be happy to help you with a full refund.

Regarding the payment method, if your original card is no longer available, we'll issue store credit as per our policy.

To complete the return, please follow these steps:

1. Click on the 'Return/Exchange' button on your order summary page.
2. Select the reason for return (please select 'Other - Please specify').
3. Enter the reason for return and provide a brief explanation.
4. Print out the pre-paid return shipping label and attach it to the outside of the package.

Once we receive the returned item, we'll process the refund within 7-10 business days, as per our payment policy.

If you have any further questions or concerns, please don't hesitate to ask. I'm here to help.

Best regards, [Your Bot Name]