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AI - Assignment - 3. 192372105

using Backward chaining for query of Resolution in Amazon's customer support AI

Introduction:

In today's digital economy, customer satisfaction and efficiency in service, delivery are vital for companies like the Amazon, which handle millions of orders daily. one common customer query is, "where is my order?' (wismo).

Efficiently resolving such questions is critical to optimize query resolution. Amazon employs artificial intelligence (AI) techniques such as backward chaining - a rule-based inference.

How Backward chaining Helps trace the source of a customer's issue:

Backward chaining is a goal-driven approach commonly used in expert system. when they applied to amazon's AI-driven begins with customer's

customer's question (goal), such as "where is my order?", and then searches backward through rules to find the facts that support an answer.

Example:

Goal: Determine the status of an order.

Rule:

If orderStatus (x) is true, then:

orderstatus(x) ← shipped (x) ∧

Not delivered (x) ∧ location (x, y)

Here, the system needs to confirm:

* was the order shipped?
* Has it not been delivered?

(Not delivered (x))

* where is it currently? (location (x, y))

Tracing logic:

1. the system receives the query: "where is my order?"

2. It sets the goal: find orderstatus (x)
3. It checks rules that could conclude orderstatus(x)
4. It looks for existing data in external systems.
5. one all conditions are met, it provides the answers.

This process is highly traceable. if the AI can't verify a shipment, it highlights that the issue likely lines in warehouse. If location tracking fails.

B) Rule-Based example for determining the status of a delayed shipment:

* orderstatus(x) ← shipped (x) ∧ Not delivered (x) ∧ location (x, y)
* shipped (x) ← orders confirmed (x) ∧ Dispatchtime (x, t1)
* location (H, y) ← carriestracking (x, y)

Sample workflow:

Query: "where is my order"?

Step 1: Try to satisfy order status(x) by the evaluating:

* is it shipped? (check warehouse logs)
* It is not delivered?
* where is it? (query carries system)

c) How backward chaining Reduces Redundant queries and improves Agent efficiency

Benefits:

- Focused Data Retrieval.
- Fastes Resolution.
- Contextual intelligence.
- Improved escalation.

Real-world Impact:

Instead of an agent manually checking shipment records. carries postals, order delivery status.

D) challenges with Backward chaining in high-volume customer system.

1. Performance Bottlenecks:

If the rule system is not optimized, each query could trigger expensive searches, slowing down system performance under the high load.

2. Incomplete or Inaccurate Data:

Backward chaining fails if critical facts are missing or systems (e.g. cashier APIs) are unavailable. unlike forward chaining, which can make conclusions with partial date backward.

3. complex Rule maintanance.

As bussiness rules revolve (e.g. changes in delivery policies, multiple cashiers), updating and maintaining thousands of interdependent rules becomes labor-intensive.