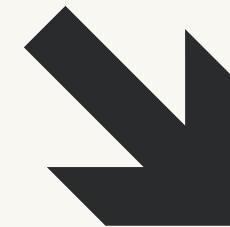
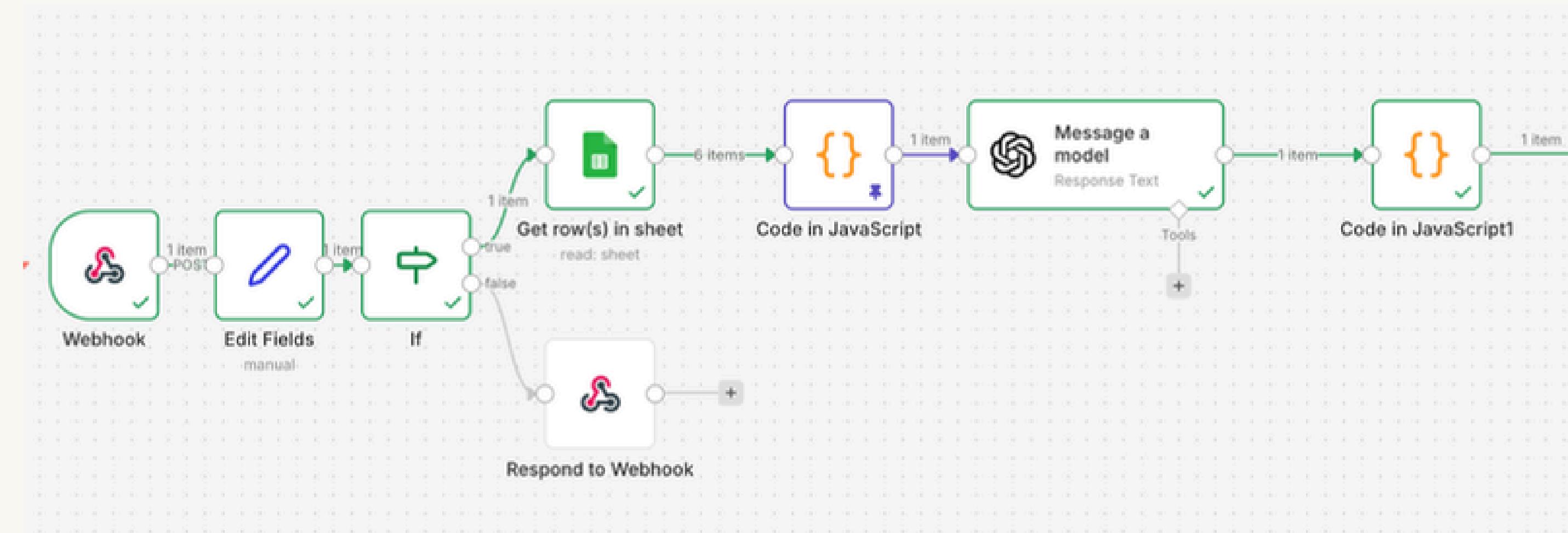


AI RAG Chatbot with Intent Classification & Lead Scoring



Built with n8n + OpenAI + Google Sheets



April Atkinson
“Architecture & Workflow Design Project”



Problem

- Chatbots often return unstructured text
- No deterministic validation
- No intent classification
- No lead prioritization
- No structured API response

I built a structured RAG workflow that transforms raw user input into validated, classified, and scored business output.



Design Principles

- Deterministic before probabilistic
- Structured contracts over free text
- Validation before model invocation
- Retrieval before reasoning

System Architecture

Interface Layer

- Webhook

Control Layer

- Schema normalization
- Validation guardrail

Retrieval Layer

- Knowledge lookup
- Context aggregation

Reasoning Layer

- Structured LLM output

Delivery Layer

- JSON parsing
- API response

Separated deterministic logic from probabilistic reasoning.

Validation and retrieval occur before model invocation to minimize hallucination and maximize control.



RAG-lite Knowledge Retrieval

- Google Sheets as structured knowledge base
- Topic + keyword matching
- Relevance ranking
- Context aggregation before LLM call

Instead of sending raw questions to the LLM, relevant knowledge snippets are injected as structured context.

Google Sheets as structured knowledge base



Knowledge Base Sheet (RAG-lite)						
	A	B	C	D	E	F
1	id	topic	question_patterns	answer_snippet	source	priority
2	pricing_001	pricing	price,pricing,cost,plan,subscription	Our pricing depends on team size and required integrations. For a quote, share your company size and use case.	pricing_faq	10
3	demo_001	sales	demo,call,meeting,book	Yes—happy to do a demo. Please share your email, company, and what you want to automate.	sales_playbook	10
4	integrations_001	integrations	integrate,integration,api,hubspot,salesforce,zapier	We support integrations via API and common tools. Tell me which systems you use (e.g., HubSpot, Salesforce) and the workflow you want.	integrations_faq	9
5	security_001	security	security,soc2,gdpr,compliance,data	We can support GDPR-aligned workflows. For security/compliance requirements, share your constraints and we'll confirm what's supported.	security_faq	9
6	support_001	support	help,issue,problem,broken,error	Sorry about that—tell me what you tried, what happened, and any error message. I'll help troubleshoot or escalate.	support_playbook	8
7	fallback_001	fallback	“”	I can help—are you asking about pricing, integrations, security, or support?	fallback	1

Structured LLM Output

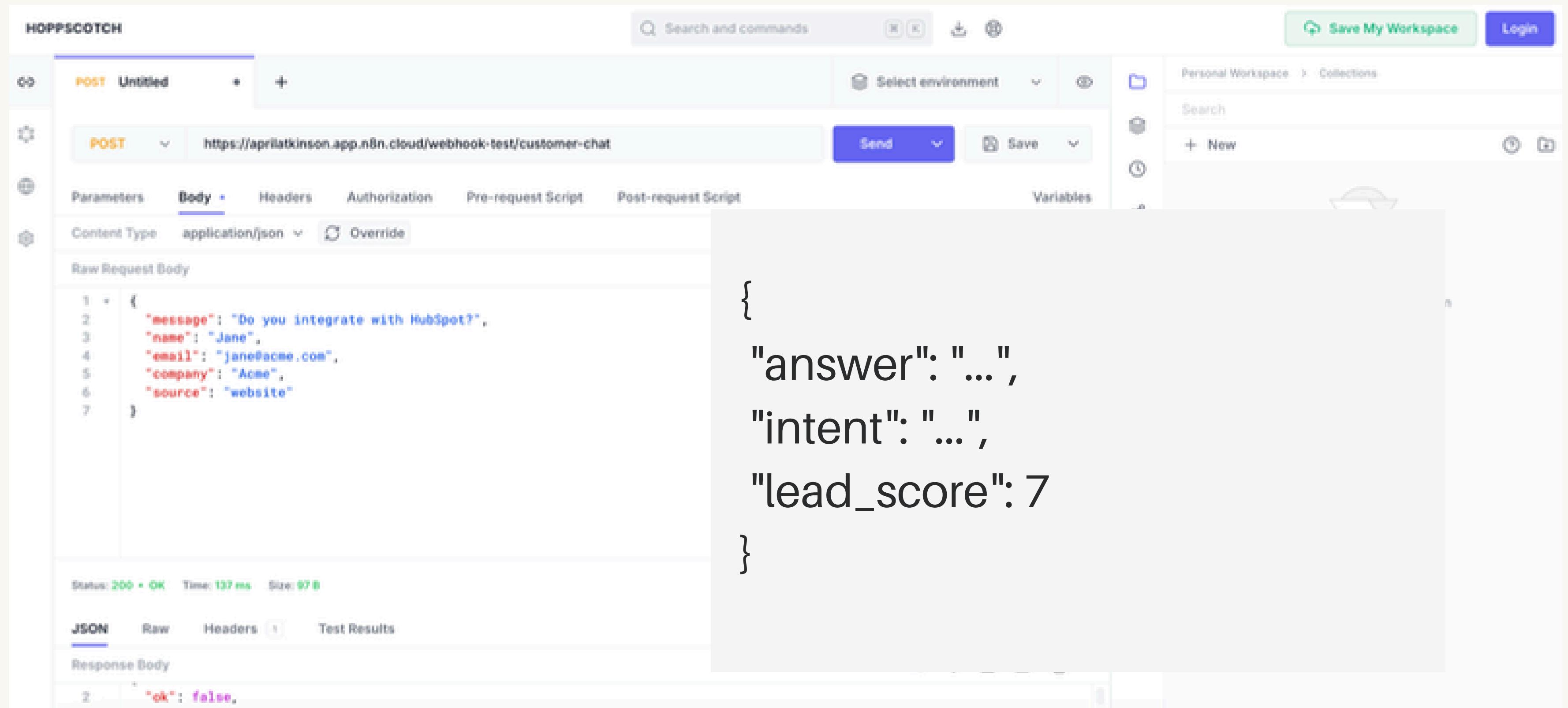
```
{  
  "answer": "...",  
  "follow_up_question": "...",  
  "intent": "integration inquiry",  
  "lead_score": 7  
}
```

- Forced JSON output format
- Intent classification
- Lead scoring
- Deterministic downstream automation

The screenshot displays a complex AI interface for message creation and management, likely a low-code platform or RPA tool. The interface is divided into several sections:

- Left Sidebar:** A tree view showing a hierarchy of components, including "Message", "Schema", "Value", and "Data".
- Header:** Includes tabs for "Properties", "Settings", and "Preview".
- Central Area:** A large panel for creating a message. It includes:
 - Recipient:** Set to "User".
 - Operation:** Set to "Message & Data".
 - Mode:** Set to "From me" (ID: 4).
 - Messages:** A list of message components:
 - Type: "Text", Content: "You are a highly rated remote account".
 - Type: "Text", Content: "User".
 - Type: "Text", Content: "User question:
Do you integrate with Subject? Contact? Please integrate Answer: No support integrations. If yes, share your company size and user count".
 - Add Message:** A button to add more message components.
 - Empty Output:** A toggle switch.
 - Customize:** A section to "Connect your own custom file tools to this node on the canvas".
 - Build as Flow:** A section with "No properties" and "Build as Flow".
 - Options:** A "None" dropdown.
- Right Panel:** A preview window titled "Output" showing the JSON representation of the generated message. The JSON includes fields like "id", "subject", "recipient", "content", "mode", "type", "text", "question", and "response".

Production-Ready API Response (test)



The screenshot shows the Hopscotch API testing tool interface. A POST request is being sent to the URL <https://aprilatkinson.app.n8n.cloud/webhook-test/customer-chat>. The request body is a JSON object:

```
{  
  "message": "Do you integrate with HubSpot?",  
  "name": "Jane",  
  "email": "jane@acme.com",  
  "company": "Acme",  
  "source": "website"  
}
```

The response body is also a JSON object:

```
{  
  "answer": "...",  
  "intent": "...",  
  "lead_score": 7  
}
```

The status bar at the bottom indicates: Status: 200 • OK Time: 137 ms Size: 97 B.

Potential Expansion

- Forced JSON output format
- Intent classification
- Lead scoring
- Deterministic downstream automation

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Thank you!