AI-Powered Business Workflow Generator

The Challenge

How might we build an AI system that converts natural language business requirements into fully functional, production-ready automated workflows - without requiring technical expertise?

The Problem

Business operations teams know what they need automated, but building workflows requires technical skills they don't have. They describe processes in plain English, then wait weeks for developers to translate requirements into workflows. Meanwhile, manual work piles up.

> *"I need to automate our employee onboarding process: send welcome email, create accounts in multiple systems, provision access, schedule training. I can explain it in minutes. Building the workflow takes a developer weeks."*

> *"We have a multi-step HR onboarding process. Every step involves different systems. Connecting them all manually in a workflow builder takes days of clicking and dragging."*

> *"I know which APIs I need to call, but I don't know how to find them in the documentation or how to connect them together."*

> *"When workflows break, I can't debug them. I have to wait for a developer to figure out what went wrong."*

The core issue: workflow automation tools require technical expertise. Business teams that understand the processes can't build the automation themselves. The translation layer - from business requirement to working workflow - is a bottleneck.

Why This Matters Now

Every organisation has hundreds of repetitive processes that should be automated but aren't:

- Manual work doesn't scale: HR onboarding, expense approvals, data entry, document processing, compliance workflows
- Technical bottleneck: Operations teams depend on developers to build every workflow
- Slow iteration: Changing a workflow requires developer time, creating delays
- Knowledge gap: Business experts know the process, developers know the tools - neither has both

Low-code workflow tools help, but still require:
- Understanding API documentation
- Configuring authentication and credentials
- Mapping data between systems
- Debugging integration errors
- Testing and validation

Generative AI can bridge this gap - turning conversational requirements into executable workflows.

The Opportunity

Build an AI-powered workflow generator that:

1. Conversational Requirement Collection:
   - Natural language input: Business users describe what they need in plain English
   - Example: "When a new employee is hired, send them a welcome email, create their accounts, add them to Slack, and schedule their first-week training"
   - Intelligent clarification: AI asks targeted questions to gather missing information
   - Process decomposition: Breaks complex requirements into logical workflow steps

2. Intelligent API Discovery & Mapping:
   - Semantic API search: Finds the right APIs from documentation based on what you're trying to do
   - Multi-system integration: Connects APIs across different platforms (CRM, HR systems, email, databases, cloud services)
   - Authentication handling: Identifies required credentials and guides configuration
   - Data mapping: Figures out how to pass output from one step as input to the next

3. Automated Workflow Generation:
   - Workflow builder: Generates executable workflows in target platform format
   - Error handling: Builds in retry logic, failure notifications, fallback paths
   - Testing framework: Automatically generates test cases to validate the workflow
   - Iterative fixing: If workflow fails during testing, AI debugs and fixes automatically

4. Human-in-the-Loop Refinement:
   - Visual workflow preview: Shows what the AI built before deploying
   - Modification support: User can request changes in natural language ("Add a delay before sending the reminder")
   - Approval gates: Business owner approves before production deployment
   - Continuous improvement: Learns from feedback to improve future workflows

The system should turn a short conversation into a working, tested workflow - dramatically reducing the time from requirement to deployment.

Constraints

Constraint	Rationale
Must demo live	Show actual workflow generation from conversation.
AI must add value	This is an AI hackathon. GenAI must be core to your solution.
Non-technical friendly	Business users should understand the conversation without technical jargon.
Executable output	Generated workflows must actually work, not just look right.
Human oversight	AI generates, humans approve deployment.

Evaluation Criteria

Criterion	Weight	What We're Looking For
Insight	30%	Can non-technical users describe requirements successfully?

Usefulness	25%	Does it find the right APIs from natural language descriptions?
Craft	20%	Do generated workflows actually execute successfully?
Ambition	15%	Creative approaches to requirement interpretation or error handling?
Demo	10%	Can you tell the story of what you built and why it matters?

Questions Worth Considering

- How do you handle ambiguous requirements without asking too many clarifying questions?
- What's the right balance between AI autonomy vs. user control?
- How do you discover which APIs exist when users don't know system names?
- Can you generate workflows that work across different workflow platforms?
- How do you handle authentication/credentials securely?
- What happens when a required API doesn't exist - can AI suggest alternatives?

What Would Blow Our Minds

- End-to-end generation: "I need to automate employee onboarding" → short conversation → working multi-step workflow deployed
- Intelligent API discovery: User describes intent in plain language → AI finds correct endpoint from many APIs across multiple systems
- Self-debugging: Workflow fails during test → AI reads error logs → fixes the workflow → re-tests automatically
- Multi-platform support: Same conversation generates workflows for different platforms depending on user preference
- Learning from examples: Analyse existing workflows to understand patterns and improve future generations
- Natural modifications: "Actually, send that email later instead" → workflow updated instantly without rebuilding