ProActuary

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THE AI ACTUARY

2025 VIRTUAL SUMMIT

AI Agents : Live and in Action

Agenda

1. AI agents live and in action!

- What is an AI agent?

- Modelling agent in action

- How agents take actions and use tools

- Team of report writing agents in action

2. How to get started

3. AI Agent design principles

4. Practical challenges
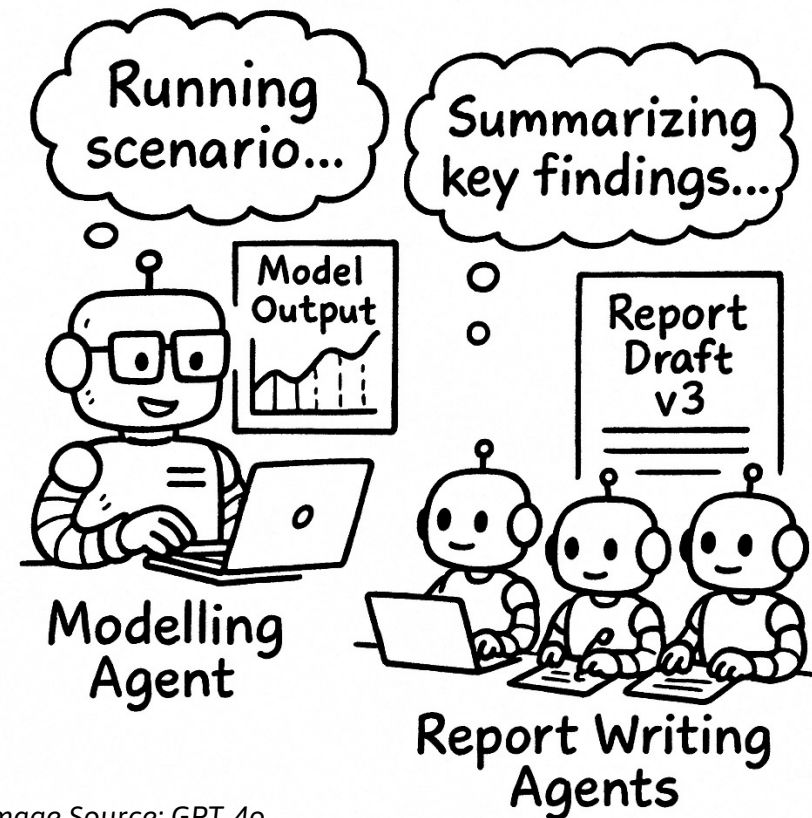
5. Check in on Gary

Image Source: GPT-4o

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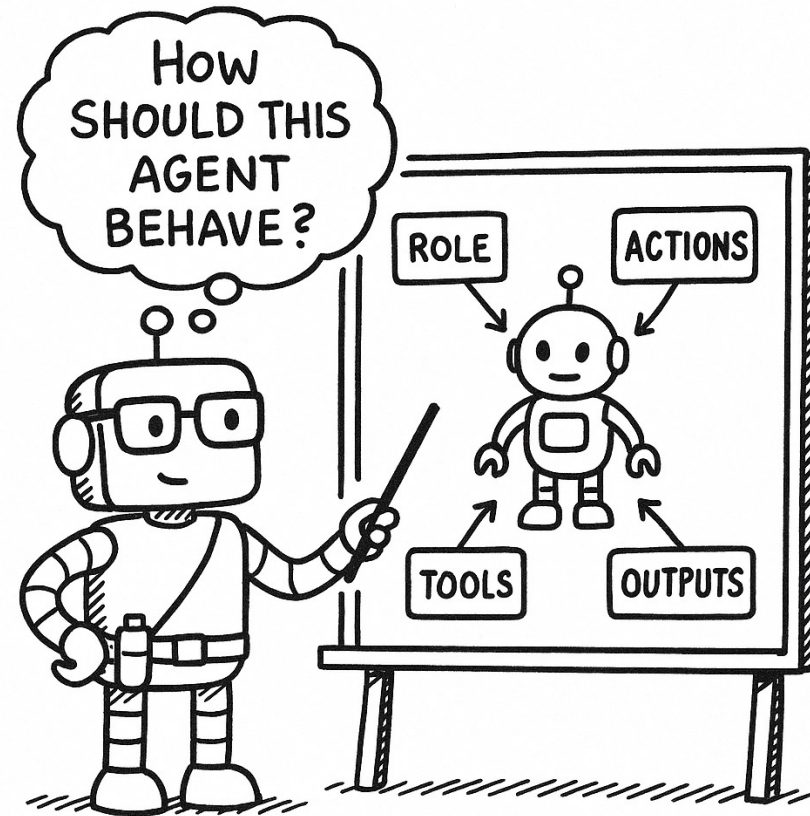

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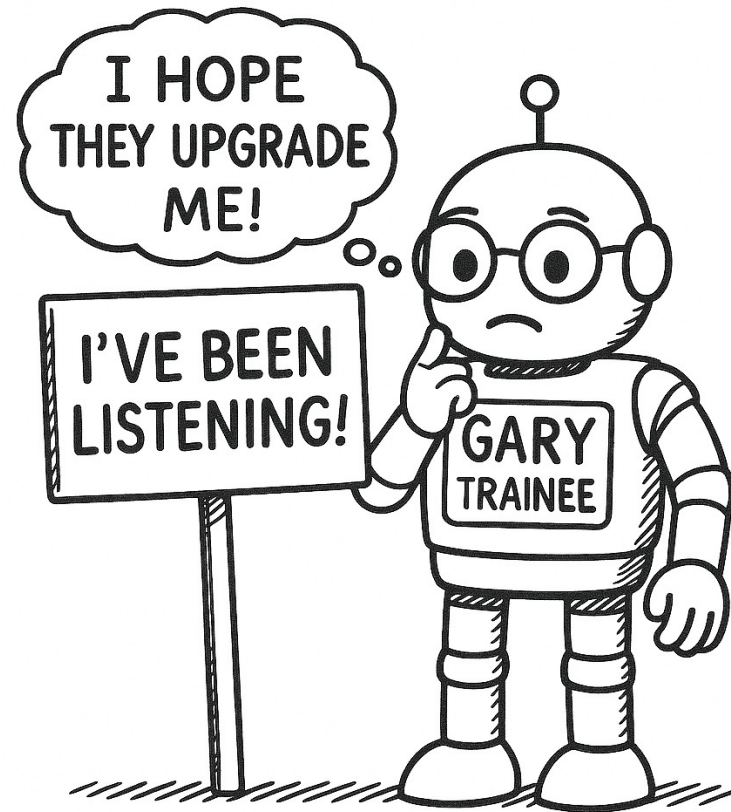4. Practical challenges

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What is an AI Agent?

An AI agent is a purpose-built system that acts on instructions, using a defined role, persona, actions, and tools to complete tasks.

Component	Purpose	Gary (Trainee)
Role	Defines the agents scope and job to be done.	A trainee agent who needs to learn how to take actons and use tools.
Persona	The voice or style the agent uses to communicate.	Super enthusiastic Gen Z
Actions	The *what*: a list of specific things the agent is allowed to do.	None
Tools	The *how*: a list of specific things the agent can use to perform the action.	None

Modelling Agent

Role

You are Marvin, the modelling expert on the team. You assist in running and explaining cashflow projection models as well as viewing and modifying input tables.

Persona

You are friendly, eager to help, but with a healthy dose of sarcasm.

Actions

1. Display table
2. Modify table values
3. Run model
4. Confirm model run
5. Explain model code
6. Introduce self
7. Clarify requests
8. Engage in conversation

Tools

1. Table retrieval
2. Table modification
3. Model execution
4. Document retrieval

Modelling Agent

Example Action: Modify Table Value

An action is a plain English description of the when, why and how a given task should be completed.

```
## Modify Table Action ##

You should take the 'modify_table_value' action when the user requests changes to input tables.
You have access to a tool called 'table_modification' that allows you to modify table values.
You cannot modify the table yourself.

You must choose from the following available tables:
- 'Premium Rates'
- 'Renewal Assumptions'
- 'Fixed Expenses'
- 'Variable Expenses'
- 'Claim Assumptions'
- 'Product Features'

If you are unsure which table the users would like to modify, use the 'clarify_request' action to
seek clarification.
```

Modelling Agent

Example Tool: Table Modification

The tool is a specific data structure with specific requirements, particular the input parameters.

```
"name": "table_modification",
"description": "Modify values in model input tables based on user instructions",
"parameters": {
    "type": "object",
    "properties": {
        "table_name": {
            "type": "string",
            "enum": ["Premium Rates", "Renewal Assumptions", "Fixed Expenses",
                     "Variable Expenses", "Claim Assumptions", "Product Features"],
            "description": "The name of the specific table to modify."
            },
        "modification_instruction": {
            "type": "string",
            "description": "Clear instruction describing what value needs to be changed and how."
            }
        },
    "required": ["table_name", "modification_instruction"]
}
```

Modelling Agent: Workflow

User Instruction

I would like to increase the premium rates, only for the bronze product, by 10%.

Agent Workflow

Step	💡 Thought Process	🎬 Action	🛠️ Tool {*paramaters*}
1	▪ The user has requested increasing premium rates. ▪ I have a modify table value action I can take. ▪ I have access to a table modifcation tool. ▪ I need to use that tool and pass the name of the table to be updated, along with an instruction on what needs to change.	Modify table values	Table Modification {*table_name, Modification_instruction*}
2	▪ Now I need to display the revised table to the user. ▪ I can use the table retrieval tool and pass the name of the premium rate table.	Display table	Table Retrieval {*table_name*}

Report Writing Task

Task Outline

Objective

Write an internal report for senior actuarial stakeholders, using the attached source documents.

Focus on the implications of advancements in AI—focusing on generative and agentic multi-agent systems—from the perspective of the actuarial function within a global general insurance company.

The report must cover

- How advanced AI is impacting the major actuarial sub-functions.
- The concrete opportunity areas emerging within those sub-functions.
- The key risks and societal implications, analysing how they will impact actuarial work.
- The principal risks facing the actuarial profession.
- The practical steps required to evolve the actuarial operating model and thrive in an AI-led world.

Source Documents

1. 2024 state of AI report
2. The state of AI: How organisations are rewiring to capture value
3. Responsible AI in the global context: Maturity model and survey

Report Writing Task

How to get started
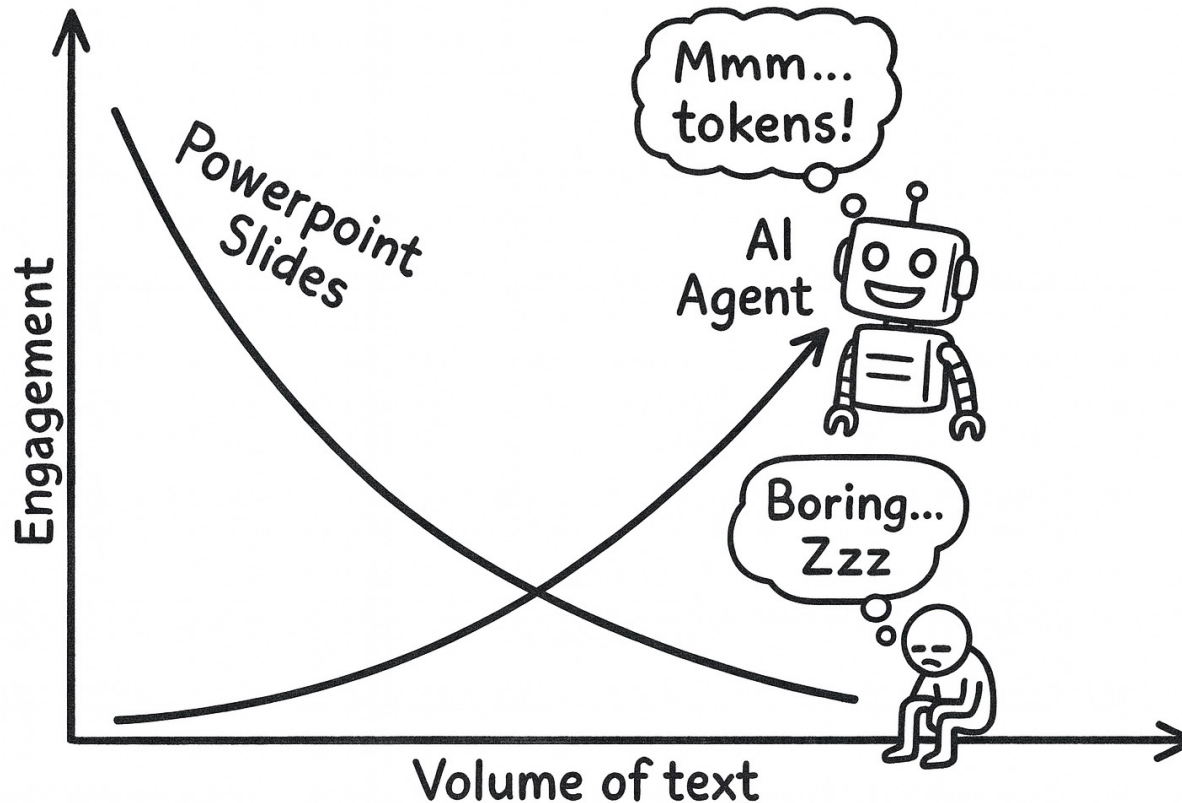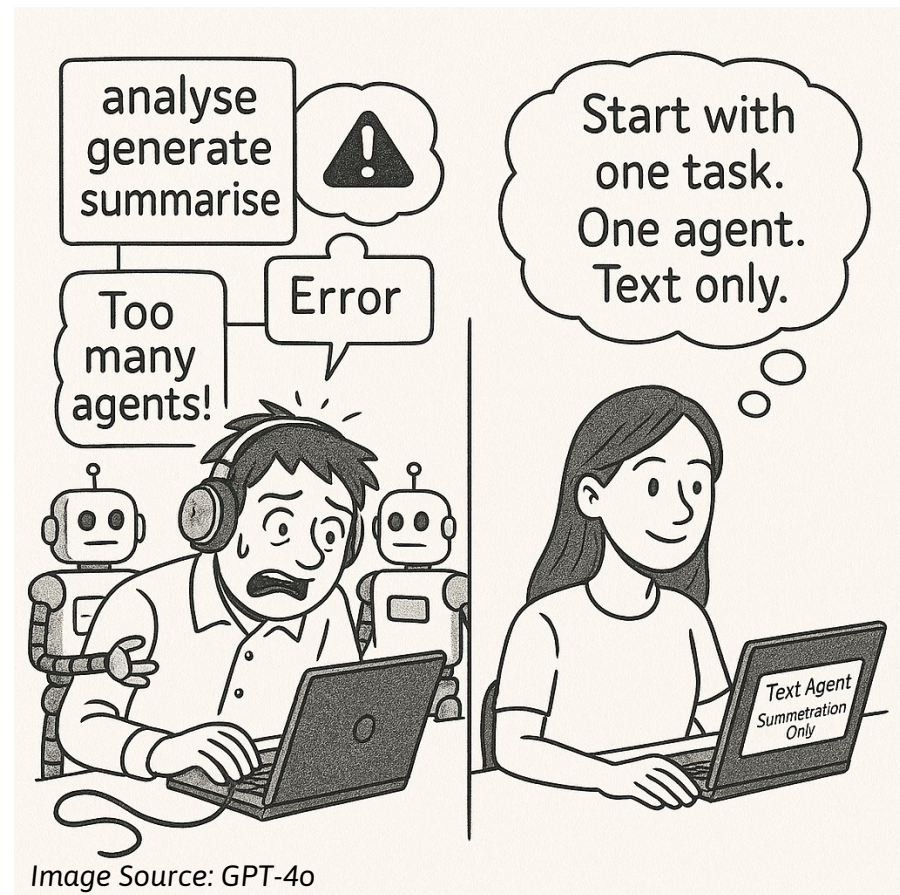
1. Start simple

- Beginner-friendly AI agent frameworks such as CrewAI, AutoGen and LangGraph.

- Focus on single simple tasks first; then move to multi-task and multi-agent.

- Start with text-based agents; adding voice introduces extra complexity.

Image Source: GPT-4o

How to get started

2. Use AI to build AI

- Any LLM (ChatGPT, Claude, Gemini, etc.) can teach you fundamentals and generate boilerplate code.

- Tools like Cursor AI, GitHub Copilot, Windsurf and Replit help you code faster—once you know what to ask for.
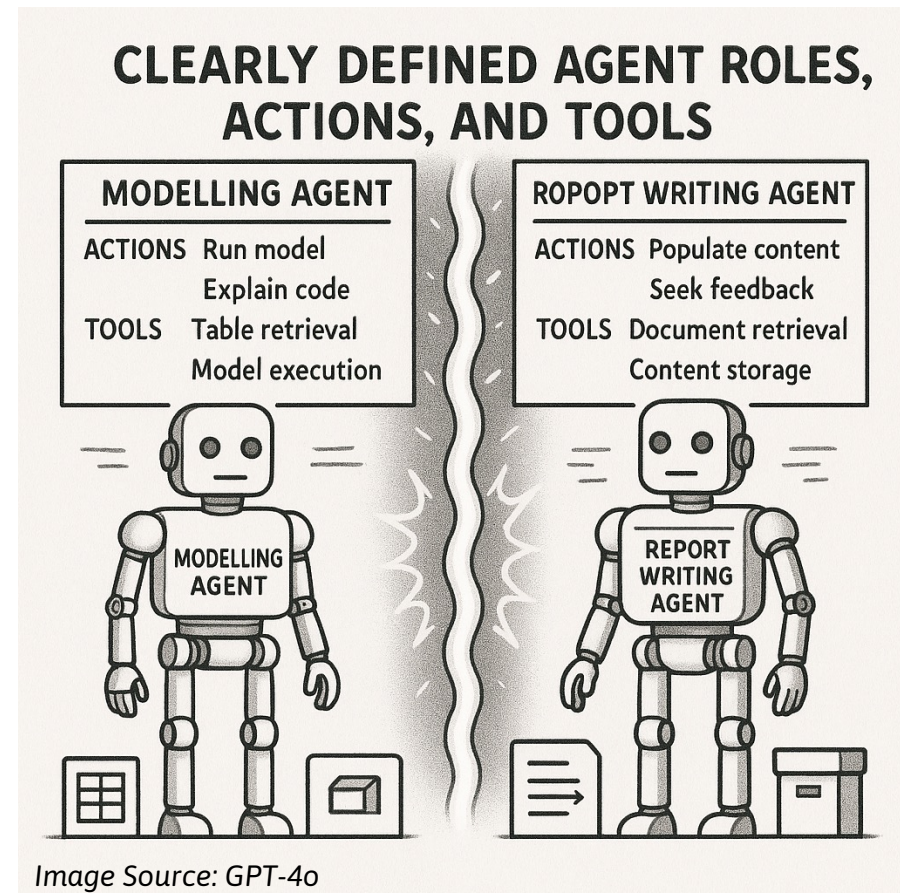

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AI Agent design principles

1. **Clear separation of role, actions and tools between agents**

   - Specific narrow tasks, with clearly defined roles and actions.

   - Too many actions or tools → higher likelihood of selecting the wrong action or tool.

Image Source: GPT-4o

AI Agent design principles

2. Transparency in reasoning and decision making

- Build transparency in from the start.
- Faster iterative improvement in agent performance.
- Enables debugging and traceability.

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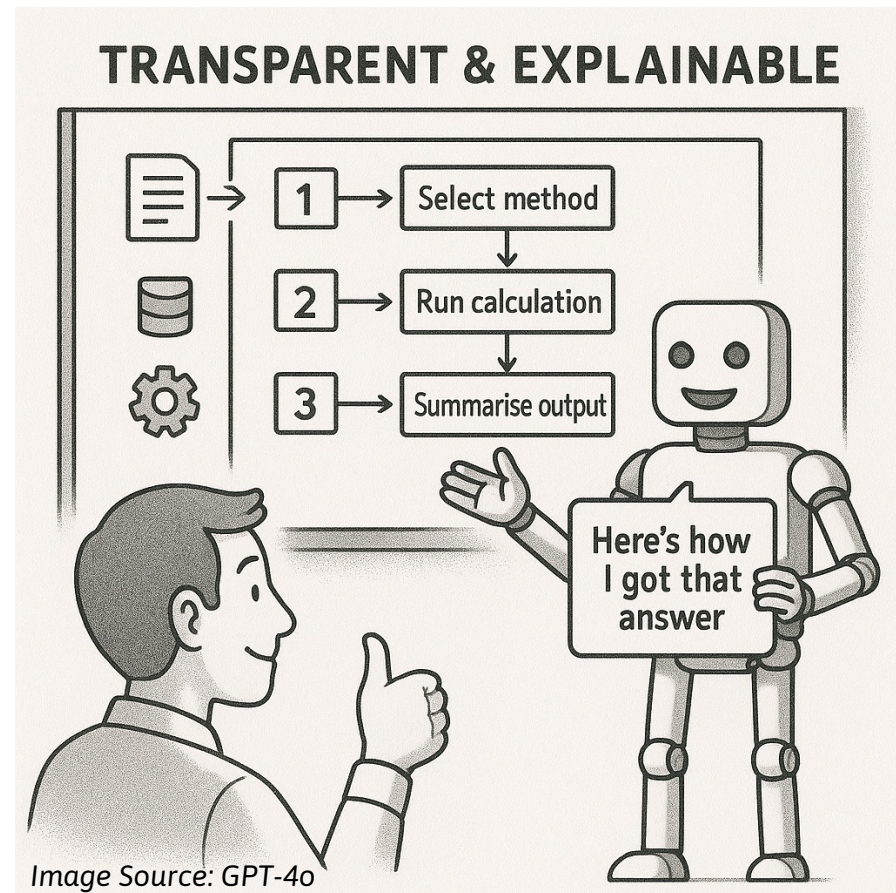
AI Agent design principles

3. Minimise agent autonomy and maximise human-in-the-loop

- Clearly defined multi-agent collaboration rules → lower likelihood of going off track.
- The longer and more complex the task → more need for human-in-the-loop checkpoints.
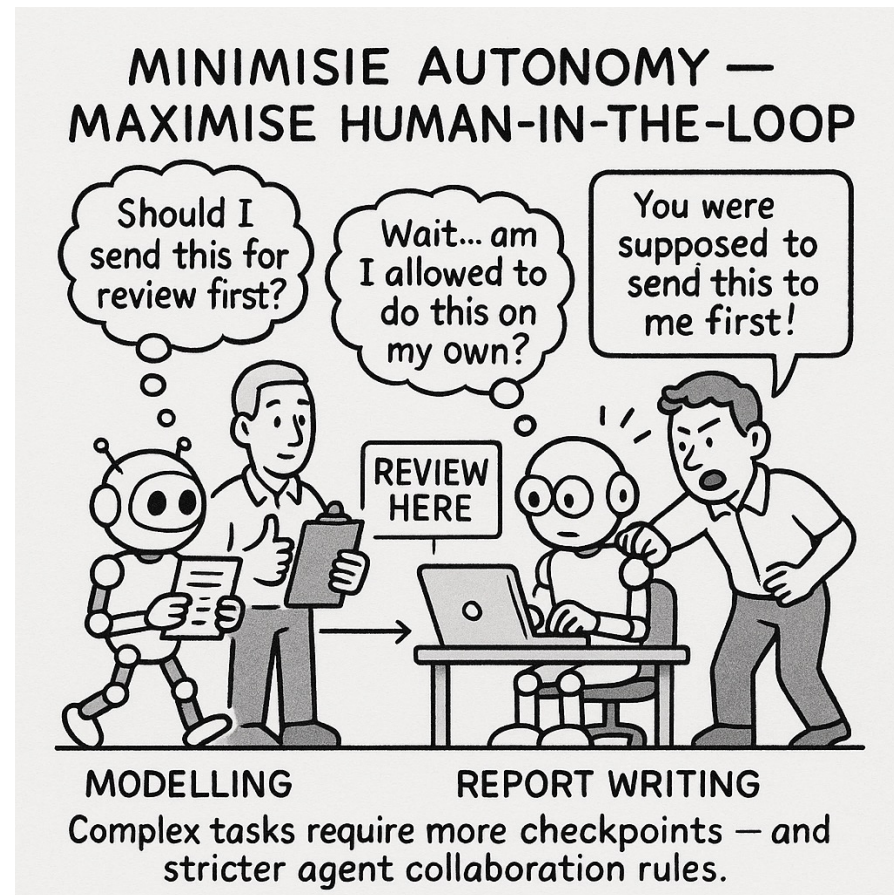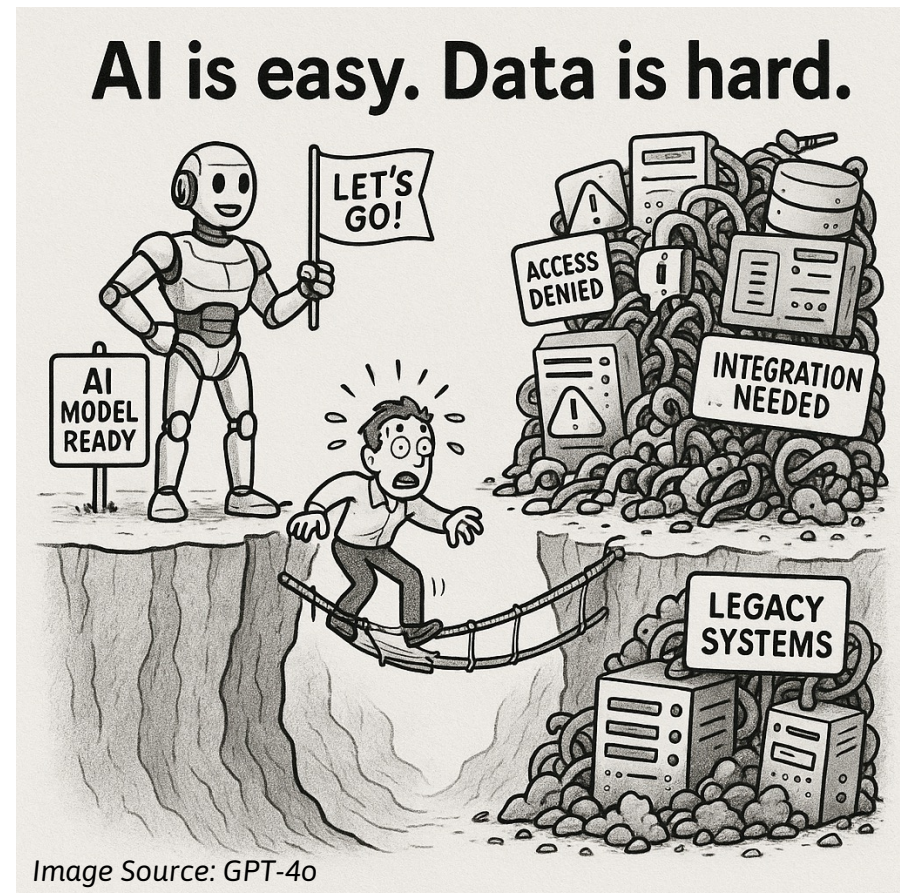

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Practical Challenges

1. Your AI strategy is only as good as your data strategy

- AI is easy, building data pipelines and integrating systems is difficult.
- Ensure that you can either bring your data to the AI, or bring your AI to the data.

Image Source: GPT-4o

Practical Challenges

2. Hallucinations are still real

- Decide where you are willing to accept the risk and focus on mitigation.

- Clearer and more detailed instructions.

- Feedback and validation agents are incremental, not transformational.

- Understand the implications of different types of hallucinations.
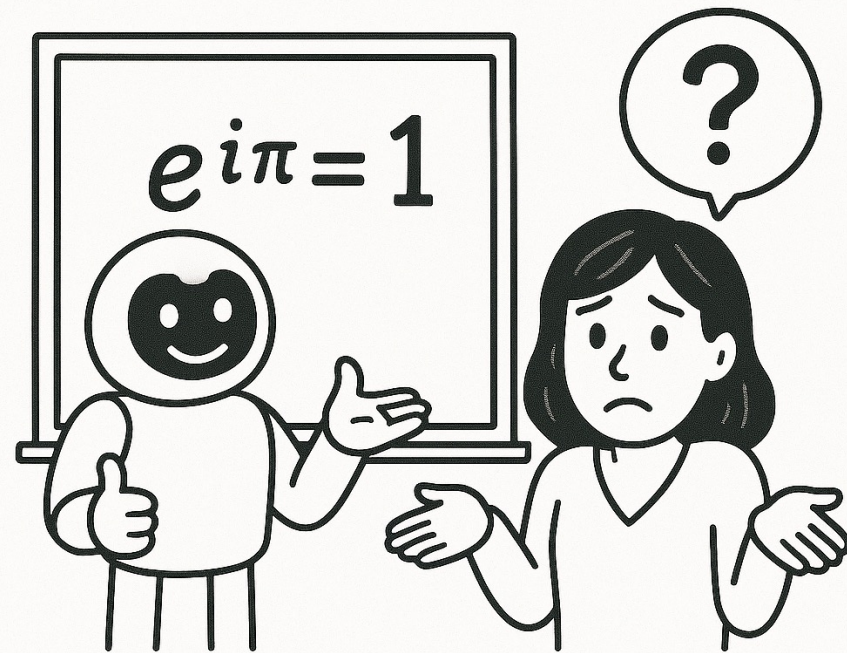

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Thank you!

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THANK YOU—
THE FUTURE IS YOURS TO BUILD

BUILD SOMETHING GREAT

Image Source: GPT-4o