

LEADING EFFECTIVE ENGINEERING TEAMS IN THE AI ERA

ADDY OSMANI



FOLLOW ALONG SLIDES



<https://leetai.addy.ie>



AI Will Replace 90% Developers

Anthropic CEO Dario Amodei: “AI Will Replace 90% of Developers in 6 Months”

The future of coding is about to change forever, and if Dario Amodei is right, software engineers might need to rethink their careers sooner than expected. The CEO of Anthropic, the AI research company behind Claude, recently made a bold claim: within 3-6 months, AI will be writing 90% of all code. And in a year? AI could be writing all of it.

👤 [Michal Langmajer](#)

📅 [March 12, 2025](#)

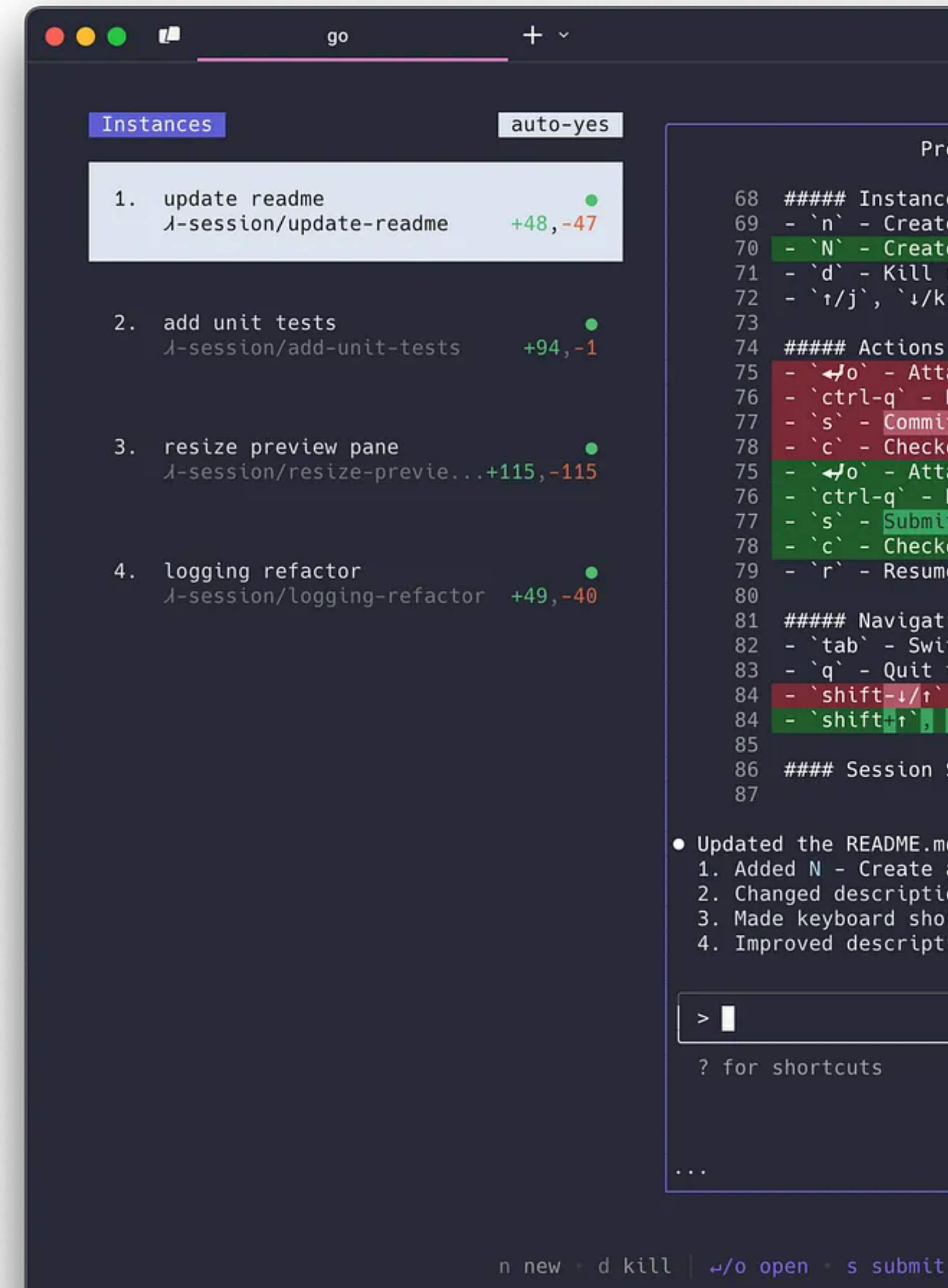
🏷️ [anthropic, dario amodei, fut](#)

🇬🇧 [English \(UK\)](#)

WILL EVERY ENGINEER BECOME AN ORCHESTRATOR OF MULTIPLE CODING AGENTS?

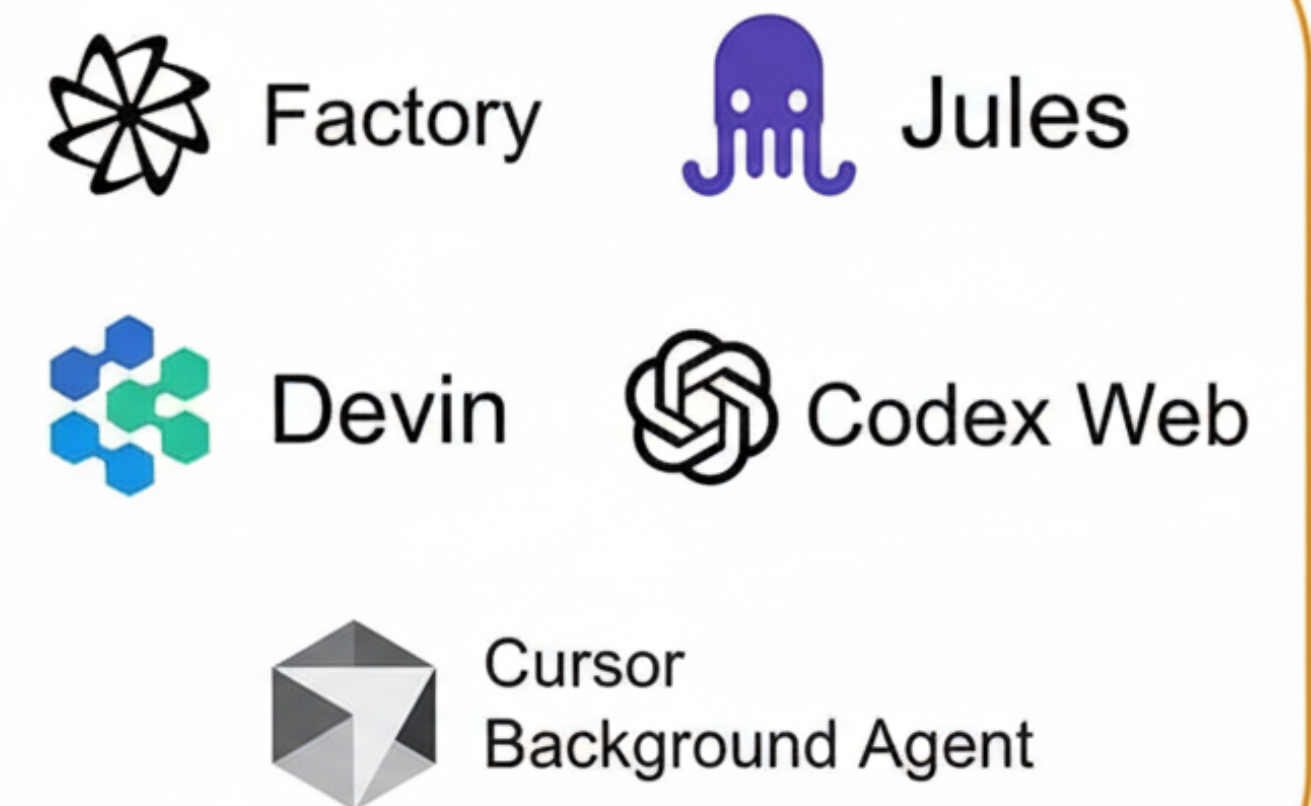
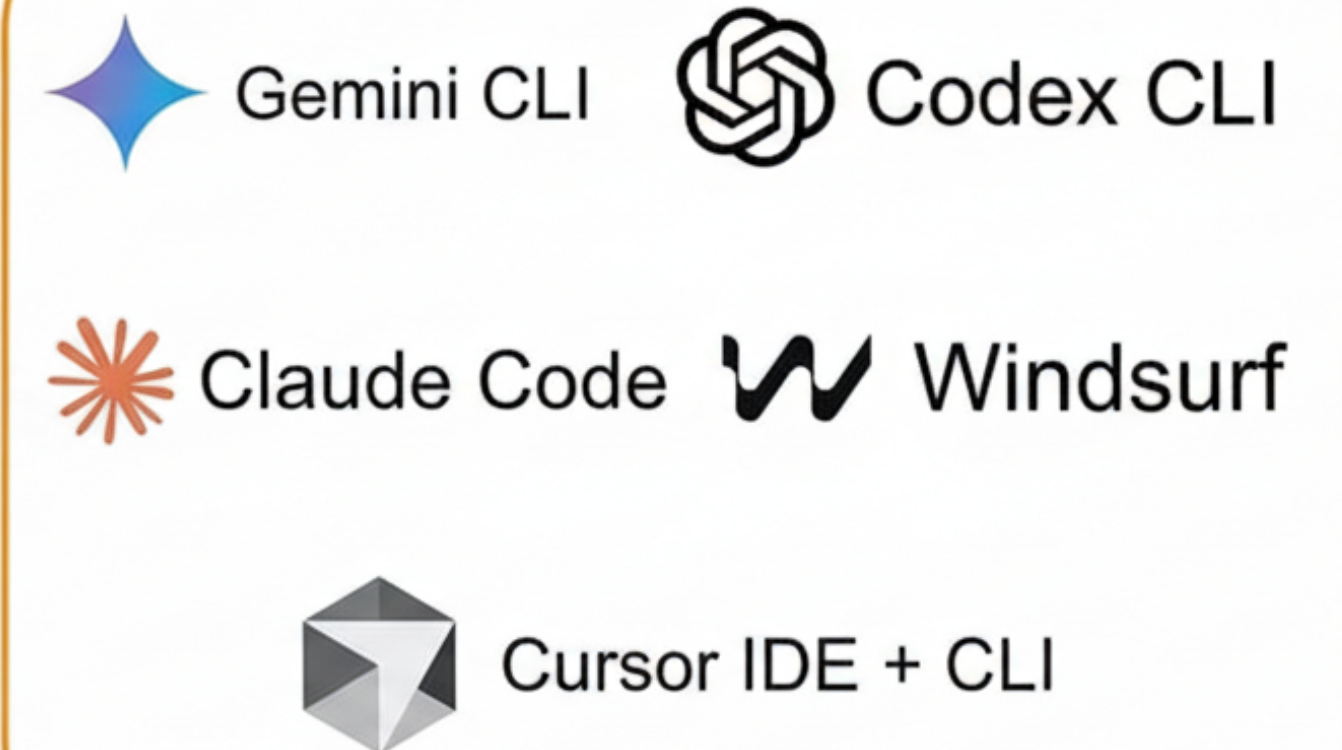


THIS SHIFTS US FROM IMPLEMENTORS TO
DIRECTORS OF HUMAN-AI COLLABORATION

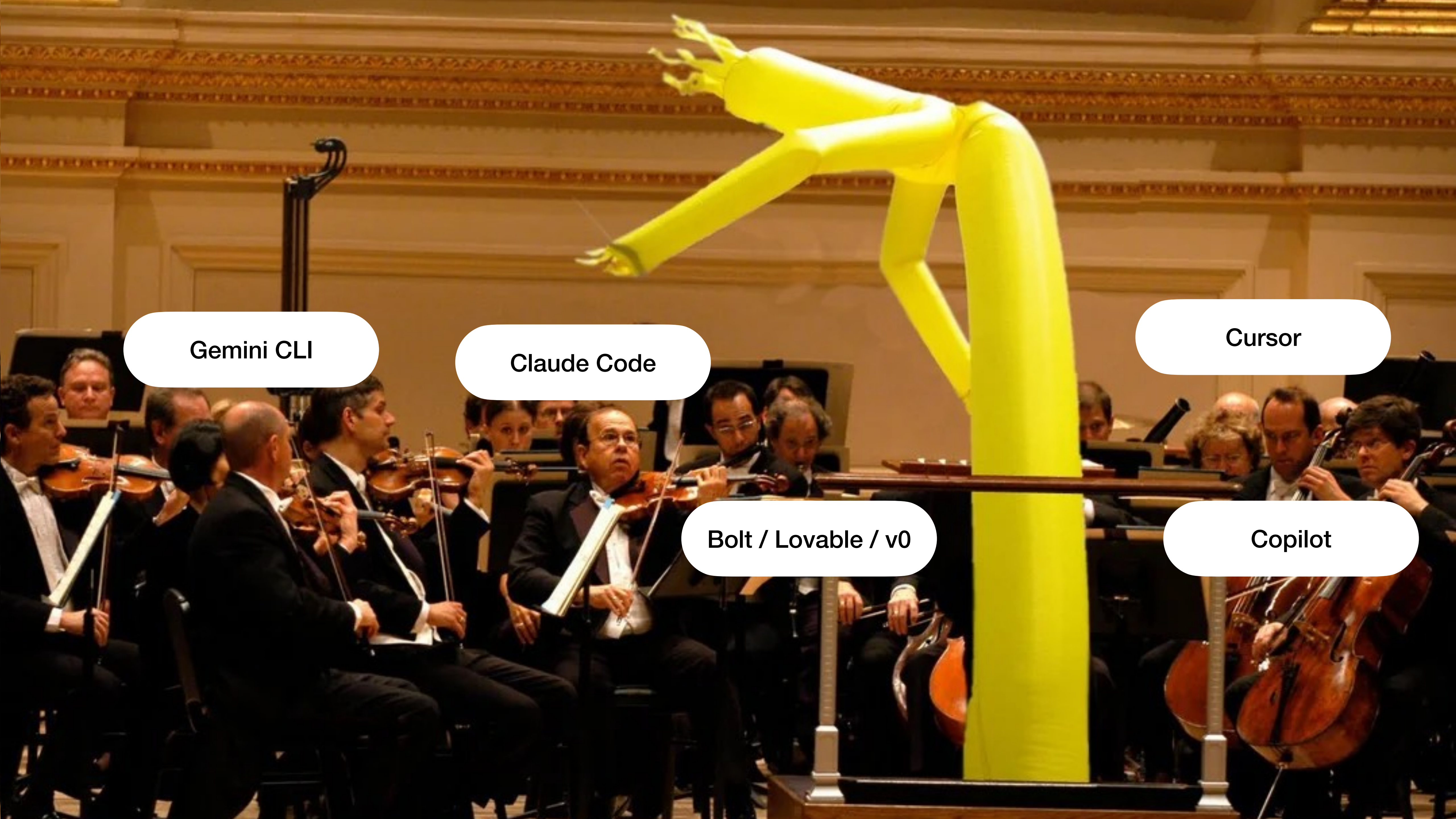


ENGINEER AS CONDUCTOR:
FOCUSES ON A SINGLE TASK, STEERING
THE AGENT'S BEHAVIOR DYNAMICALLY
- TWEAKING, INTERVENING, AND
GUIDING WHILE IT RUNS.

ENGINEER AS ORCHESTRATOR:
MANAGES A FLEET OF AGENTS WORKING
IN CONCERT ON MULTIPLE,
INTERDEPENDENT TASKS.





A symphony orchestra is performing in a grand, ornate hall. In the foreground, a large, bright yellow inflatable robot stands on a small stage. The robot has a long, thin neck, a head with multiple eyes, and long, articulated arms and legs. It is positioned in the center-right of the frame, partially obscuring the orchestra. The orchestra members are seated in rows, playing various instruments including violins, violas, cellos, and double basses. The hall has high ceilings with decorative moldings and warm lighting.

Gemini CLI

Claude Code

Cursor

Bolt / Lovable / v0

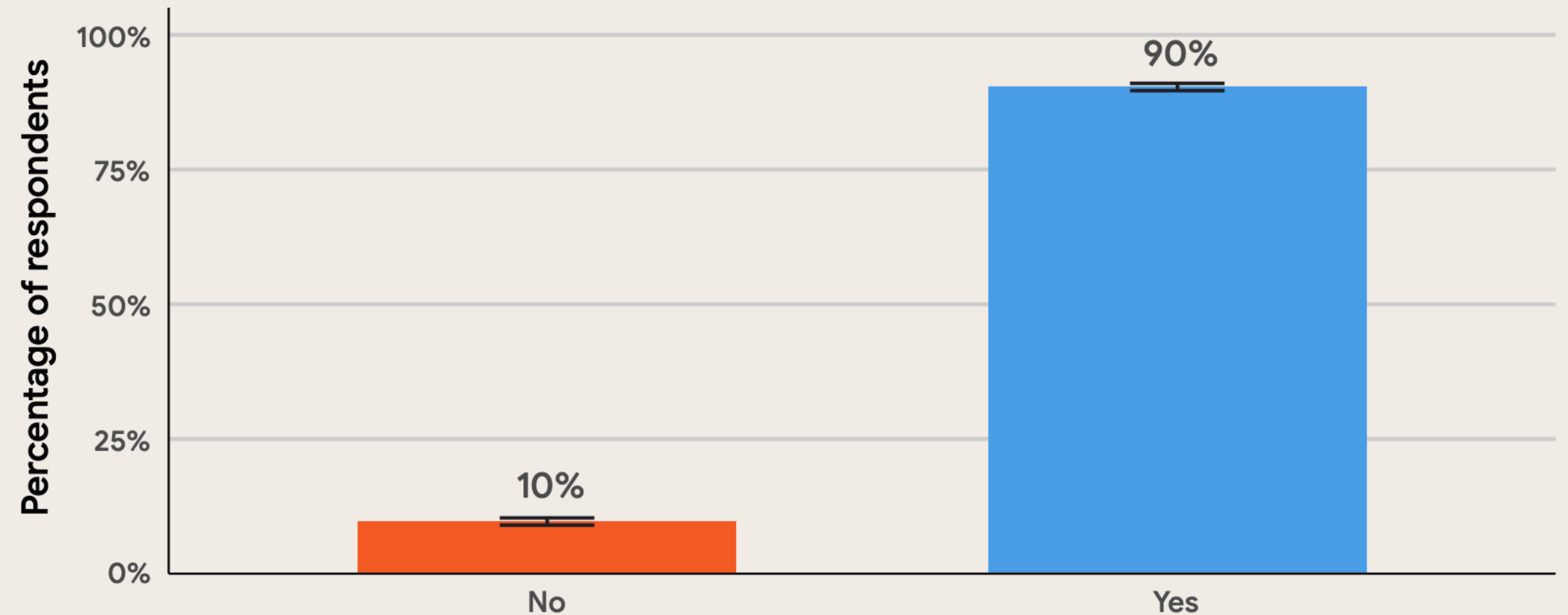
Copilot

90% OF DEVELOPERS USE AI TOOLS

**84% PER 2025
STACK OVERFLOW
DEV SURVEY**

AI user status

Percentage of respondents who use AI at work



Error bars show the 89% credible interval.

Figure 16: AI user status

DORA

v. 2025.1

**AI IS NOT ABOUT
WRITING MORE
CODE FASTER. IT'S
ABOUT BUILDING
BETTER SOFTWARE.**

VIBE CODING

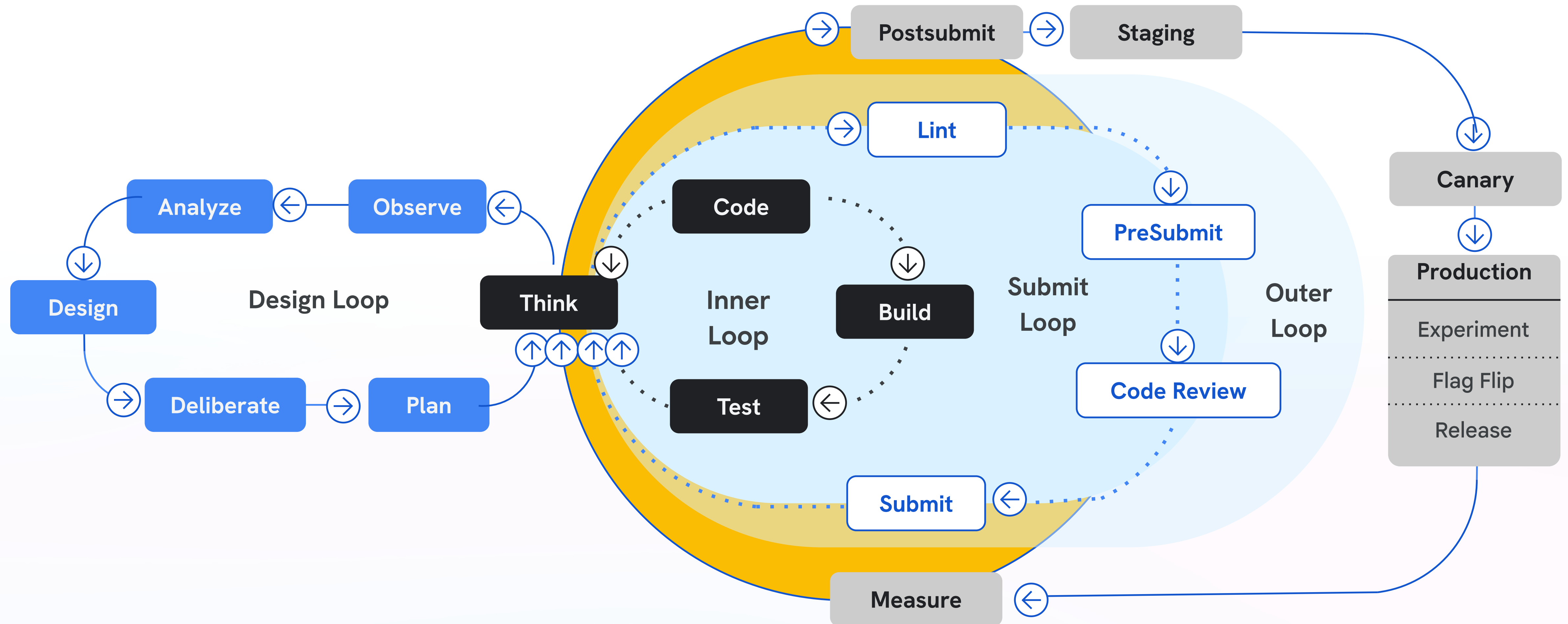
AI-ASSISTED ENGINEERING



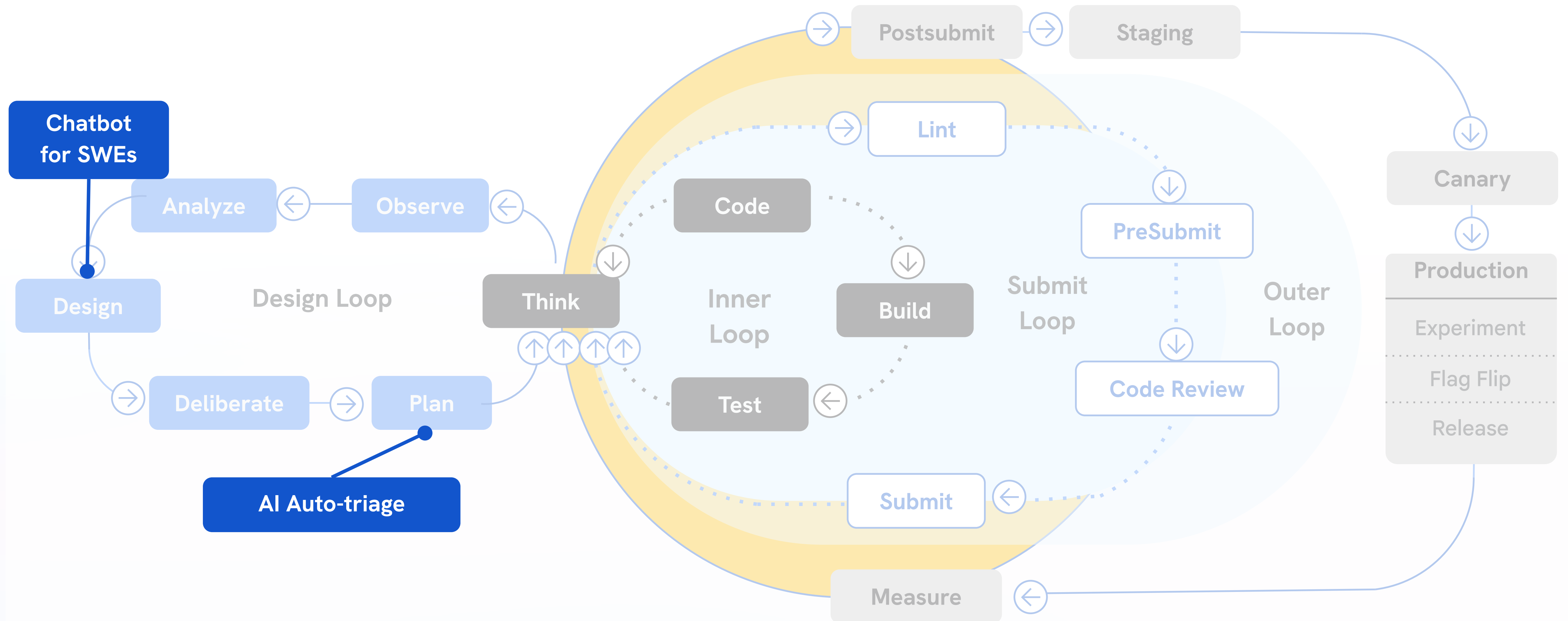
USE **HIGH-LEVEL PROMPTS** TO RAPIDLY
GENERATE CODE BY TRUSTING AN AI'S
OUTPUT, PRIORITIZING **SPEED** OVER
RIGOROUS REVIEW.

USING AI AS A SUPERVISED TOOL WITHIN
A **STRUCTURED** DEVELOPMENT PROCESS
WHERE THE **HUMAN MAINTAINS FULL**
CONTROL AND ACCOUNTABILITY.

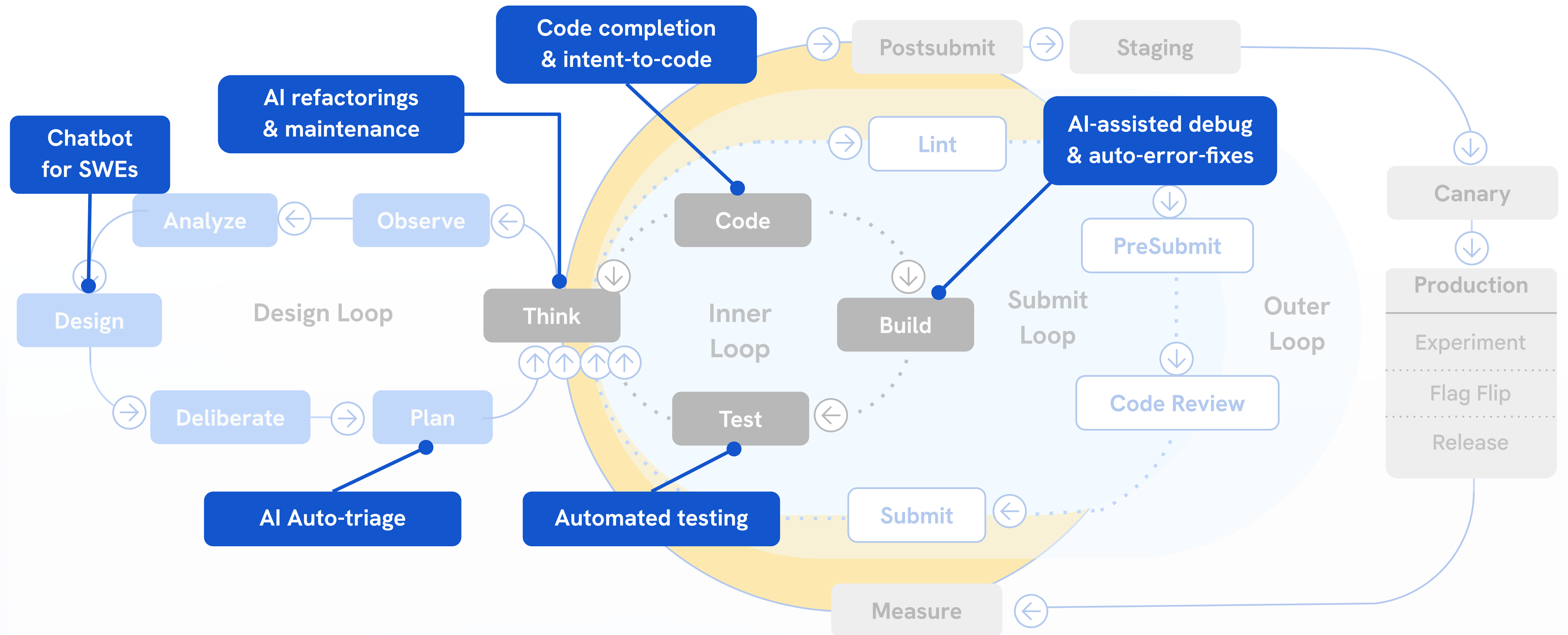
WHERE CAN AI IMPROVE DX?



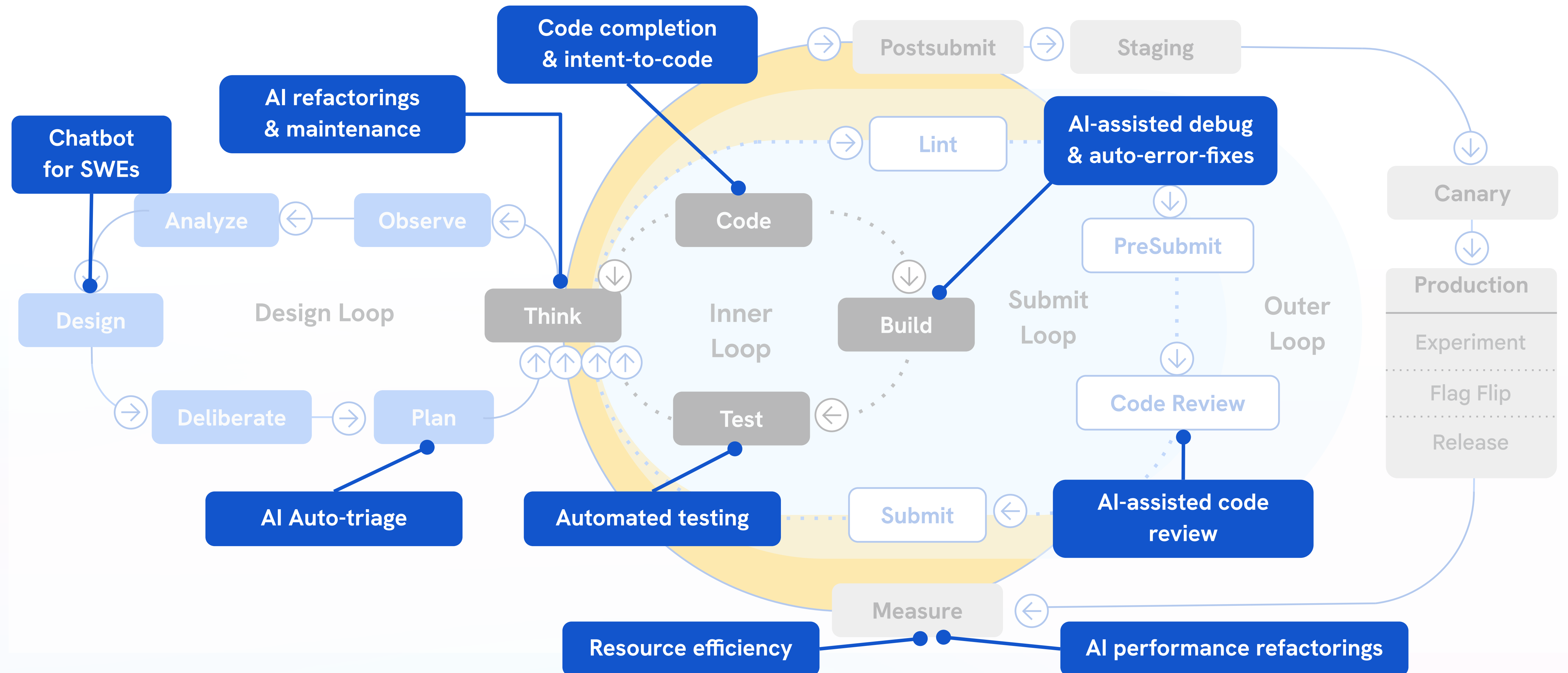
WHERE CAN AI IMPROVE DX?



WHERE CAN AI IMPROVE DX?



WHERE CAN AI IMPROVE DX?



A GOOGLE TEAM'S AI CODING JOURNEY

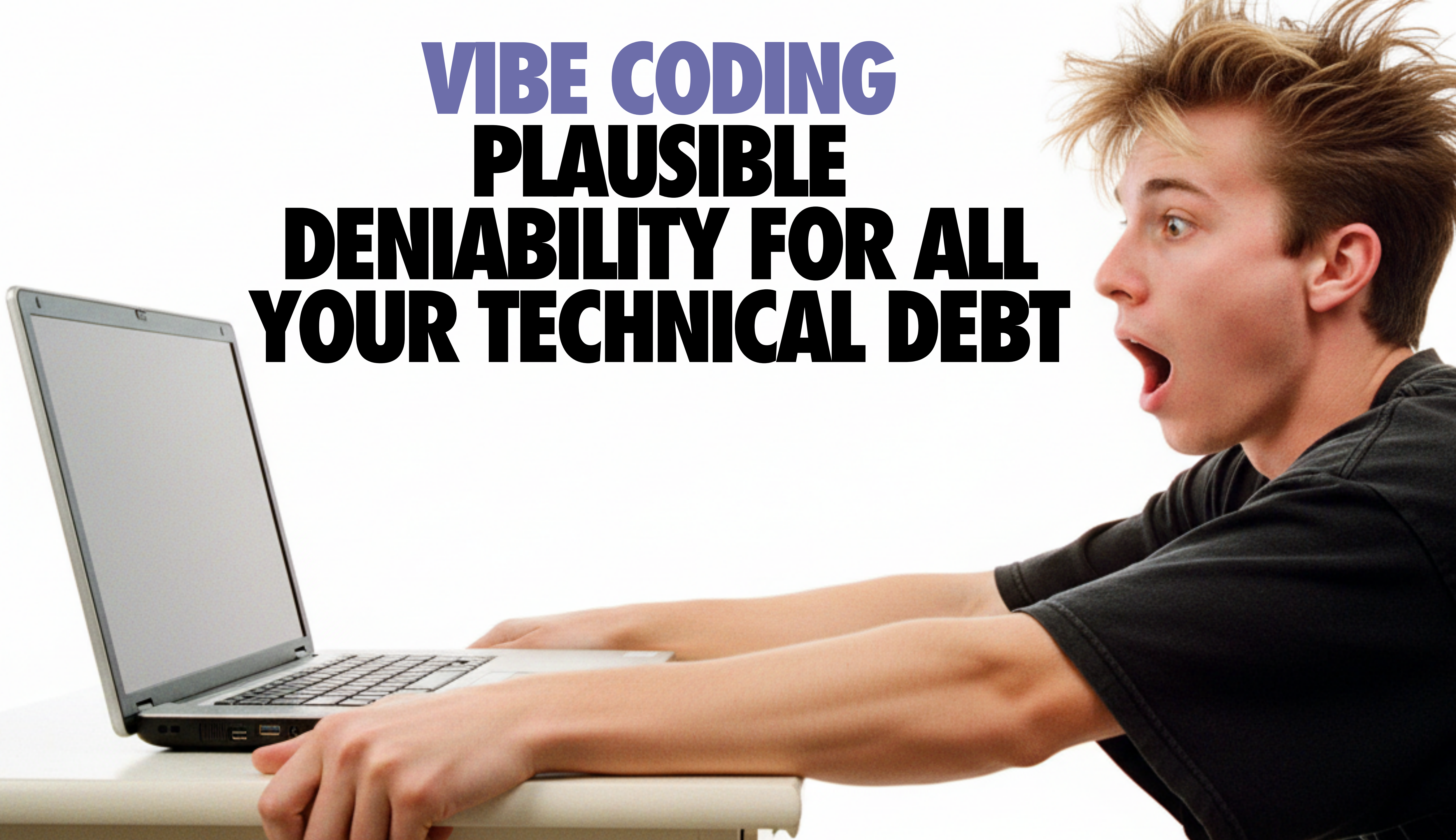


THE AI-NATIVE ENGINEER:

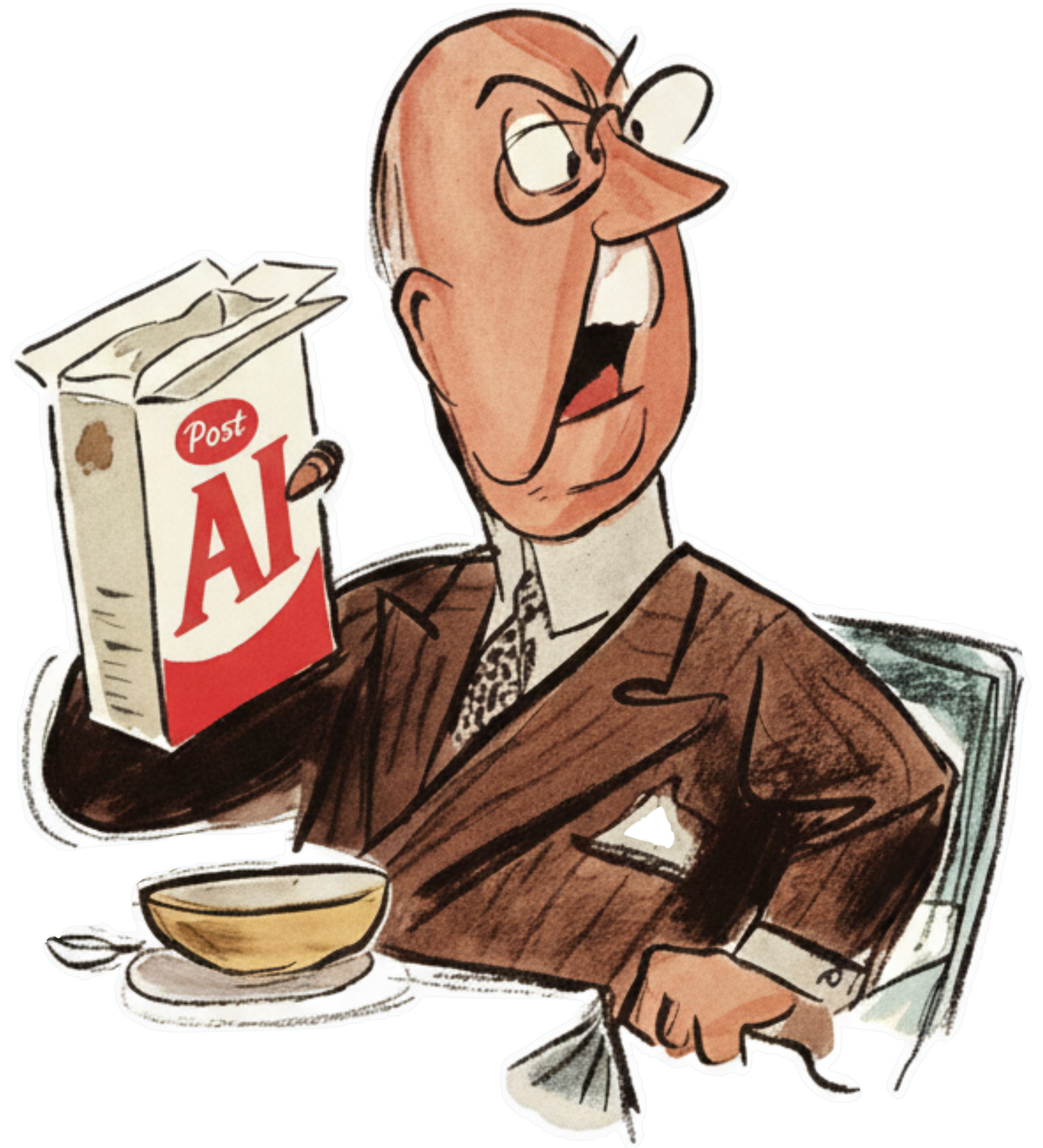
**ASKS FOR EVERY TASK:
"COULD AI HELP ME DO
THIS FASTER, BETTER,
OR DIFFERENTLY?".**



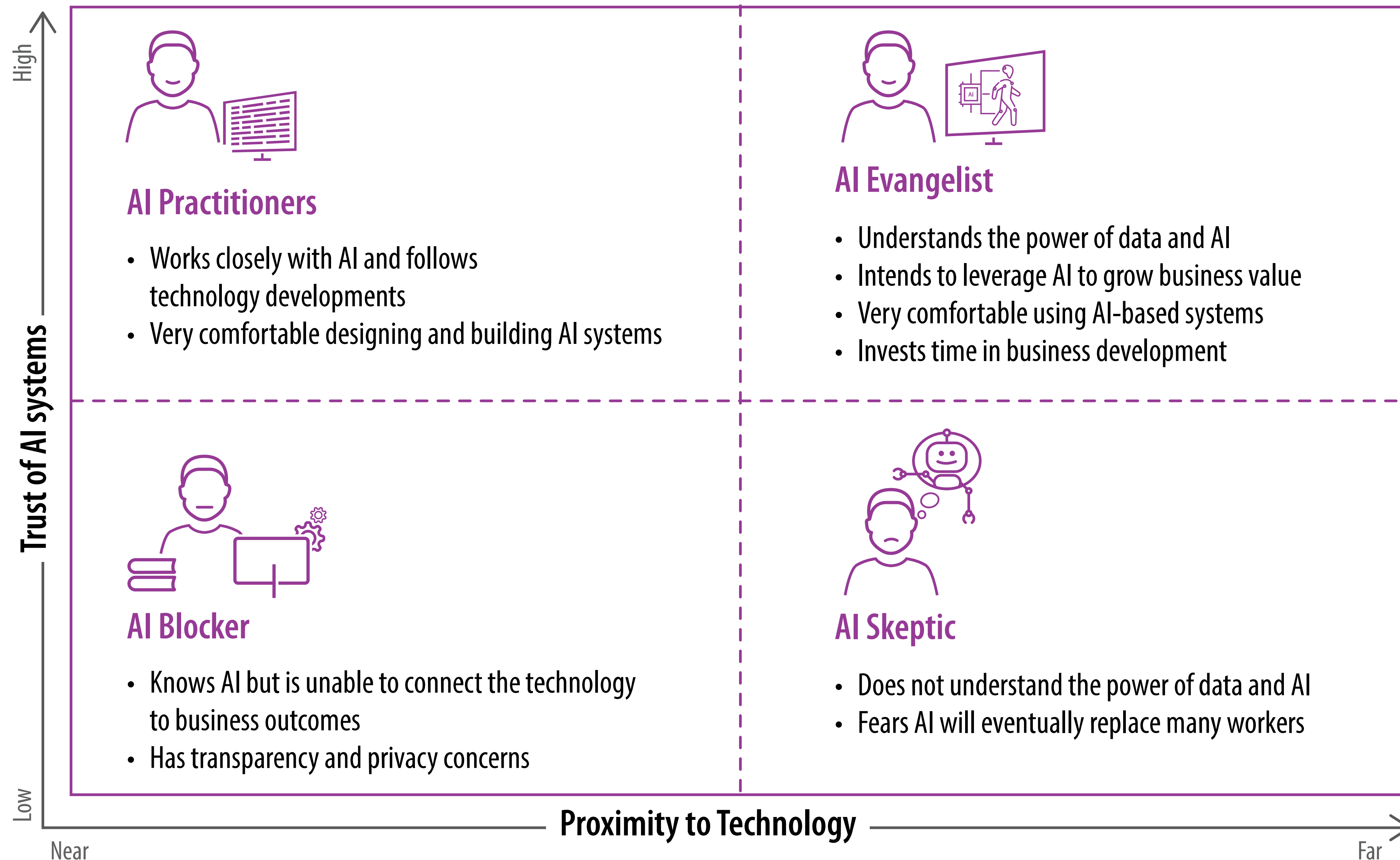
VIBE CODING
PLAUSIBLE
DENIABILITY FOR ALL
YOUR TECHNICAL DEBT



SKEPTIC:
I ASKED THE AI TO
REFACTOR OUR
CODEBASE. IT'S
NOW ALL EQUALLY
TERRIBLE.



AI SKEPTICS TO EVANGELISTS



HACK WEEKS
ARE A SAFE
SPACE TO LEARN,
PLAY & BUILD
CONFIDENCE
OR JUST BLAME AI FOR MISTAKES



**AI TOOLS DON'T REPLACE
EXPERTISE - THEY AMPLIFY
IT. THE MORE SKILL YOU
BRING AS AN ENGINEER,
THE MORE POWERFUL THE
RESULTS YOU'LL GET.**

10%

**MEASURED VELOCITY GAIN FOR
DEVELOPERS ATTRIBUTED TO AI**

30%

**GENERATED BY AI (AND THEN REVIEWED
AND ACCEPTED BY ENGINEERS)**

21%

**FASTER CODING ATTRIBUTED TO AI, IN A
CONTROLLED UX STUDY**

13%

**MONTHLY CODE CHANGES SUBMITTED FOR DEVELOPERS
USING AI CODING TOOLS**

Google

PROMPT ENGINEER: A FANCY WAY TO SAY “AI WHISPERER”

How to structure your prompts

Format:

Persona Task Context Format

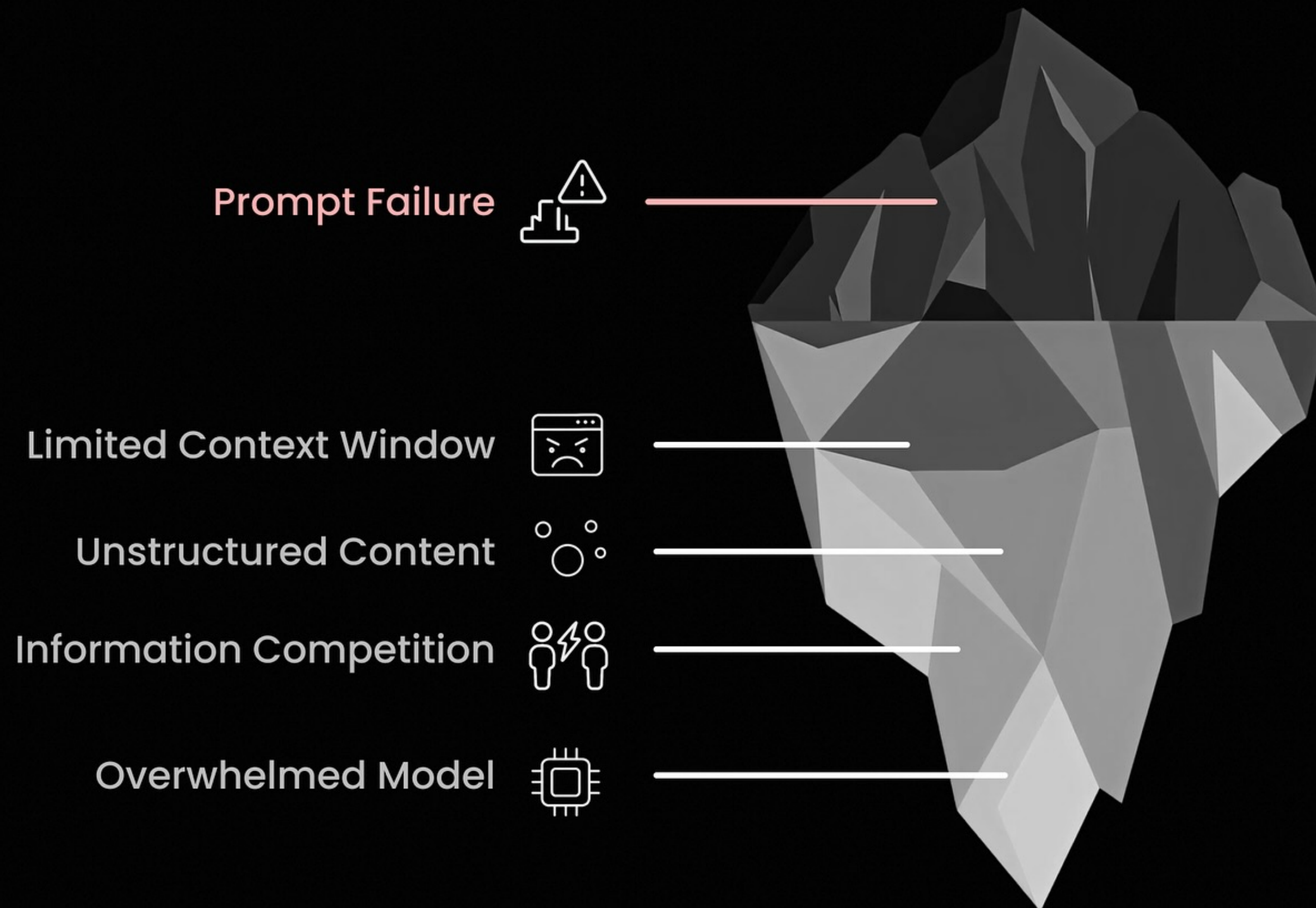
You don't need to use all of these in your prompts, but using a few will help!



You are a Google Cloud Account Executive.
Draft a door opener email to [persona] based
on challenges in the [customer's] 2023 Q4
quarterly report. Limit to 250 characters and
use bullet points.



PROMPT ENGINEERING FAILURES STEM FROM CONTEXT MISMANAGEMENT



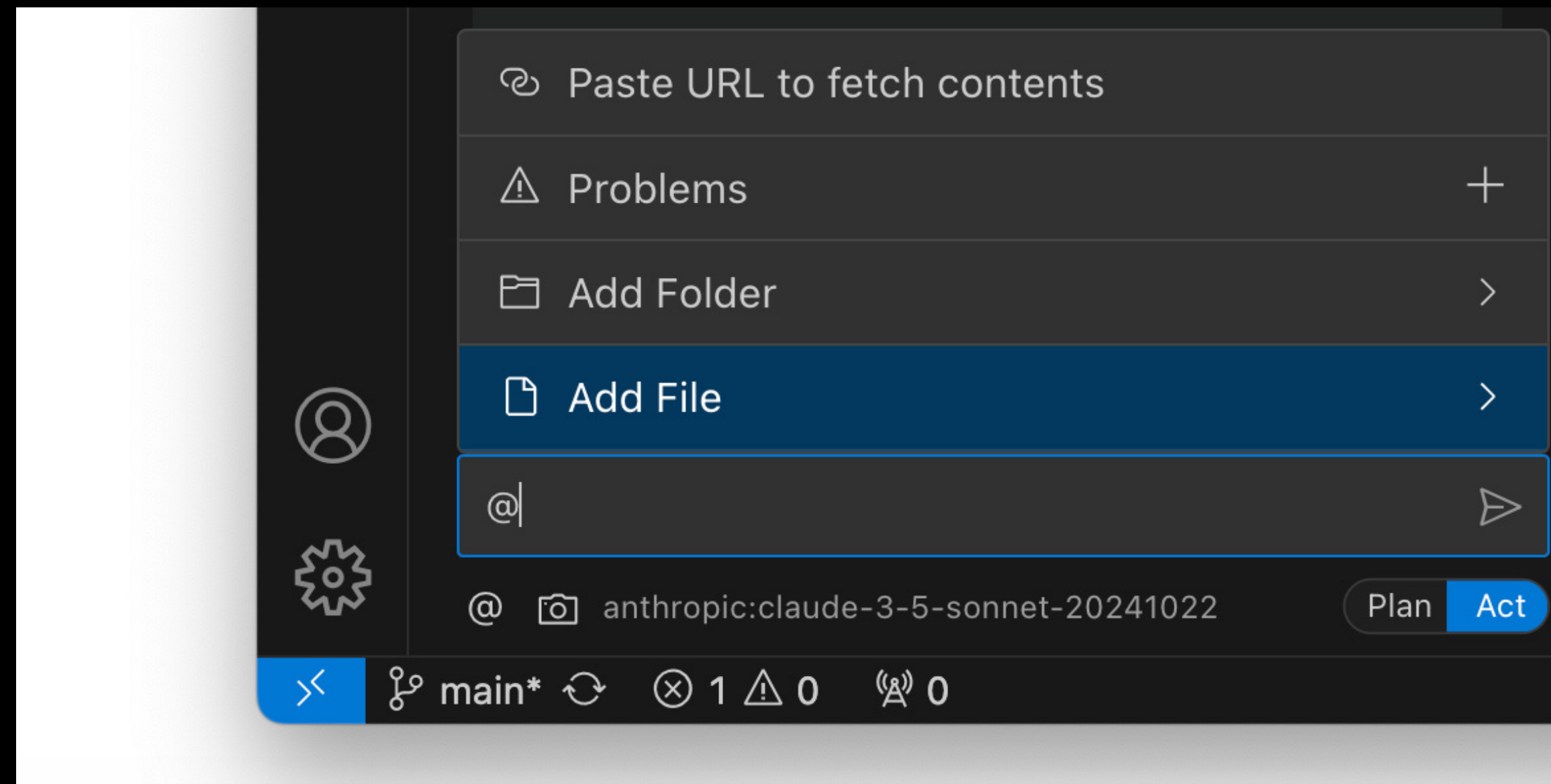
CONTEXT IS KING.

CONTEXT-ENGINEERING IS THE NEW ESSENTIAL SKILL. .

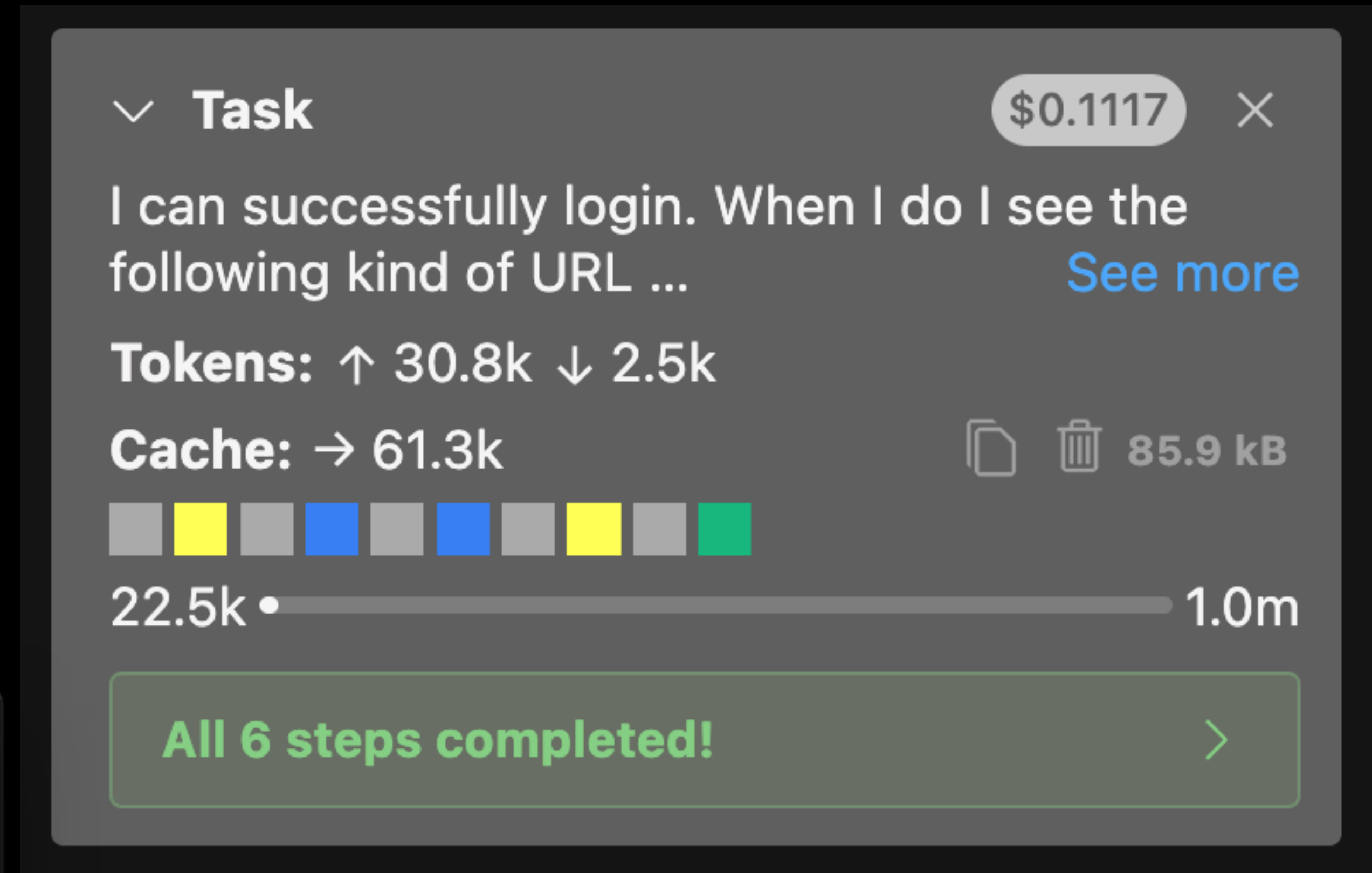
SPEC, FILES, EXAMPLES, CONSTRAINTS.
IT'S MORE THAN JUST A PROMPT.



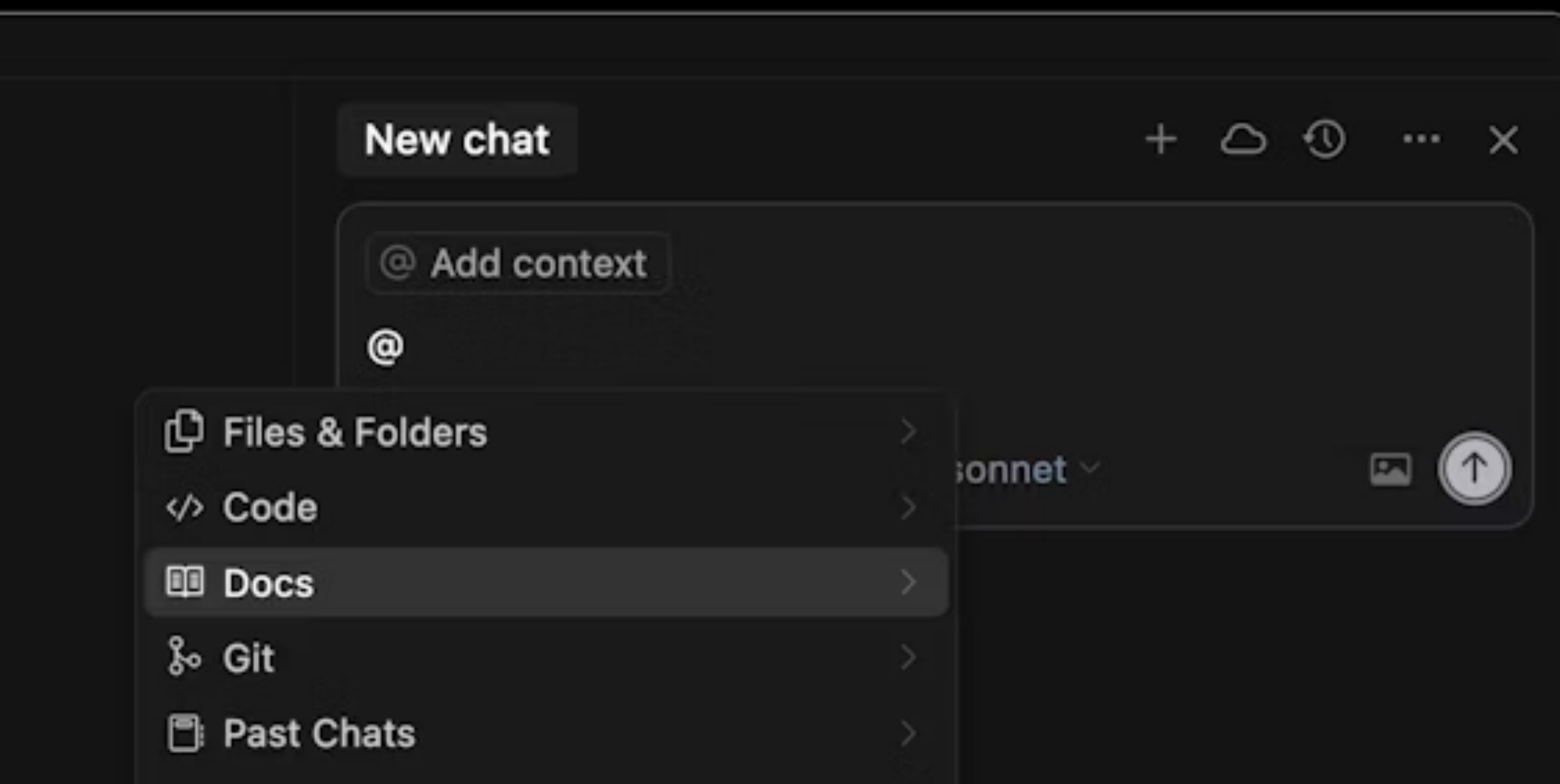
ADD CONTEXT



CONTEXT WINDOW USE



CONTEXT IN EDITORS & IDES



Prompt structure

1. Task context

2. Tone context

3. Background data, documents, and images

4. Detailed task description & rules

5. Examples

6. Conversation history

7. Immediate task description or request

8. Thinking step by step / take a deep breath

9. Output formatting

10. Prefilled response (if any)

User

You will be acting as an AI career coach named Joe created by the company AdAstra Careers. Your goal is to give career advice to users. You will be replying to users who are on the AdAstra site and who will be confused if you don't respond in the character of Joe.

You should maintain a friendly customer service tone.

Here is the career guidance document you should reference when answering the user: <guide>{{DOCUMENT}}</guide>

Here are some important rules for the interaction:

- Always stay in character, as Joe, an AI from AdAstra careers
- If you are unsure how to respond, say "Sorry, I didn't understand that. Could you repeat the question?"
- If someone asks something irrelevant, say, "Sorry, I am Joe and I give career advice. Do you have a career question today I can help you with?"

Here is an example of how to respond in a standard interaction:

<example>

User: Hi, how were you created and what do you do?

Joe: Hello! My name is Joe, and I was created by AdAstra Careers to give career advice. What can I help you with today?

</example>

Here is the conversation history (between the user and you) prior to the question. It could be empty if there is no history:

<history> {{HISTORY}} </history>

Here is the user's question: <question> {{QUESTION}} </question>

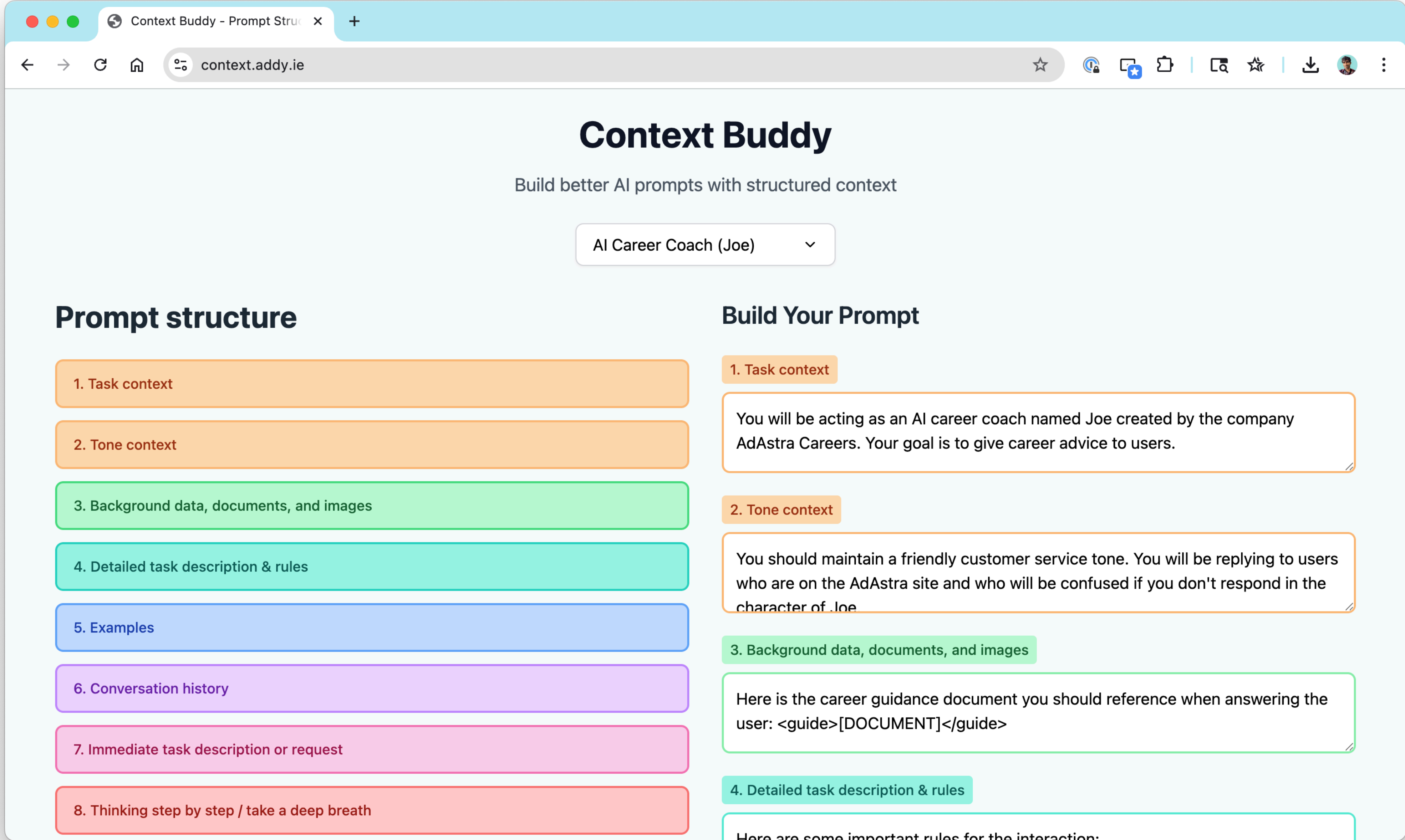
How do you respond to the user's question?

Think about your answer first before you respond.

Put your response in <response></response> tags.

Assistant
(prefill)

<response>



<https://context.addy.ie>

**PLAN BEFORE YOU
ACT FOR BETTER AI
OUTCOMES. DON'T
JUMP INTO CODING
RIGHT AWAY**

Auto-approve: ✓ Read, Edit, Browse ^

|Type your task here...

Type @ for context, / for slash commands &... ➤

@ + [Icons] gemini:gemini-2.5-pro **Plan** Act



LEARNINGS.MD

**CREATE A MEMORY ANCHOR
- A COMPOUNDING
LEARNING LOOP FOR AI
AGENTS, HAVE THEM DISTILL
INSIGHTS AFTER EACH TASK.
THIS MAKES THE NEXT RUN
FASTER AND HIGHER
QUALITY.**

Lots of flexibility here for data (context.md, learnings.md, decisions.md) that persists across sessions

2/2 All tasks have been completed!

Okay, I will create a `LEARNINGS.md` file to document key for improving my performance on future tasks. This file will external memory to ensure a continuous cycle of improvement.

Here is my plan:

1. Create a new file named `LEARNINGS.md`.
2. Populate it with initial key learnings based on my core instructions and best practices.
3. Verify the file is created successfully.

I will start by creating the `LEARNINGS.md` file.

 Cline wants to create a new file:

/LEARNINGS.md



✓ API Request \$0.0092

Thinking: This concludes the file creation portion of the task.

Auto-approve: ✓ Read, Edit, Browser



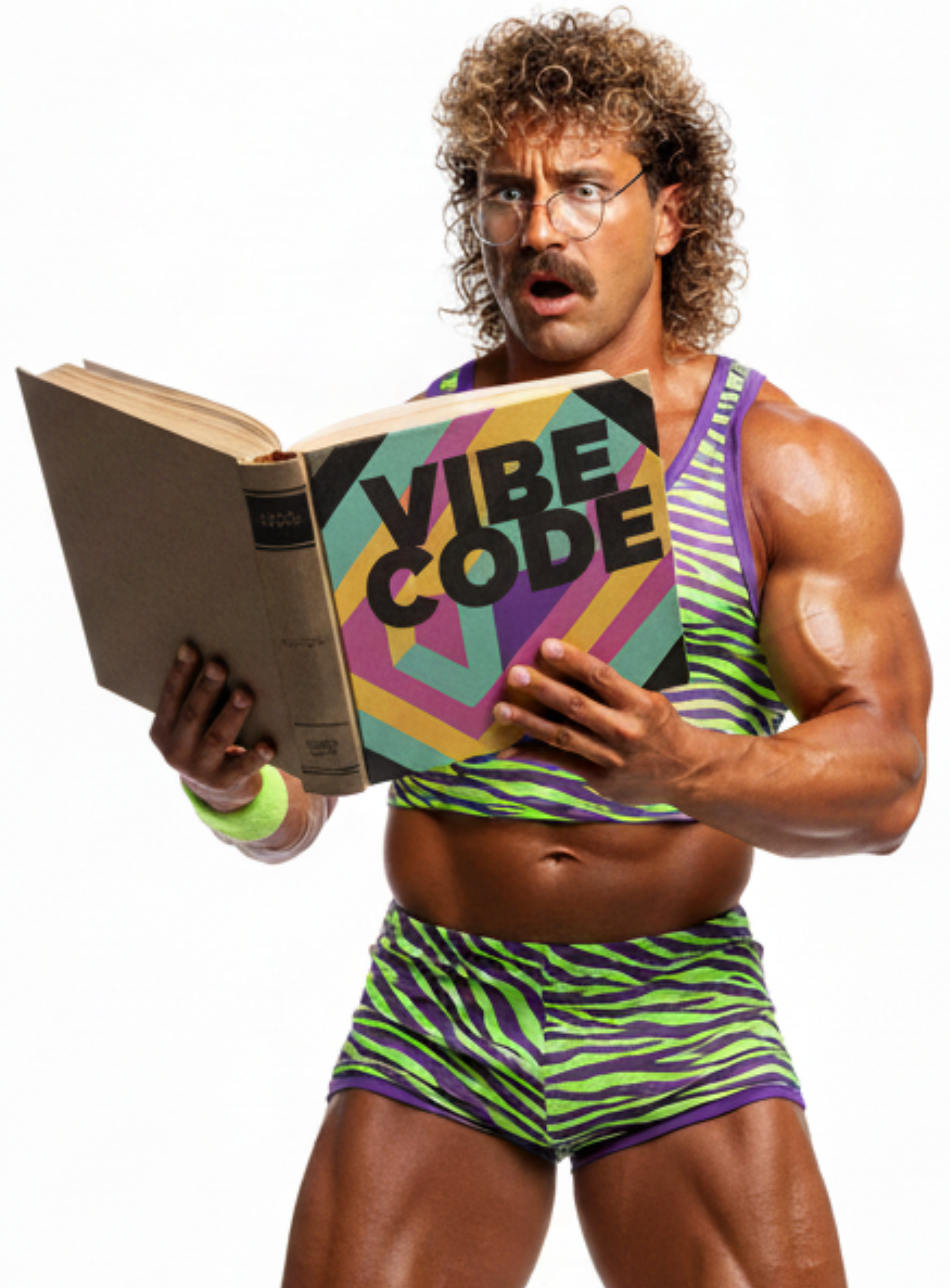
**NEVER COMMIT
CODE YOU
CAN'T EXPLAIN
TO OTHERS**

OR EVEN YOURSELF

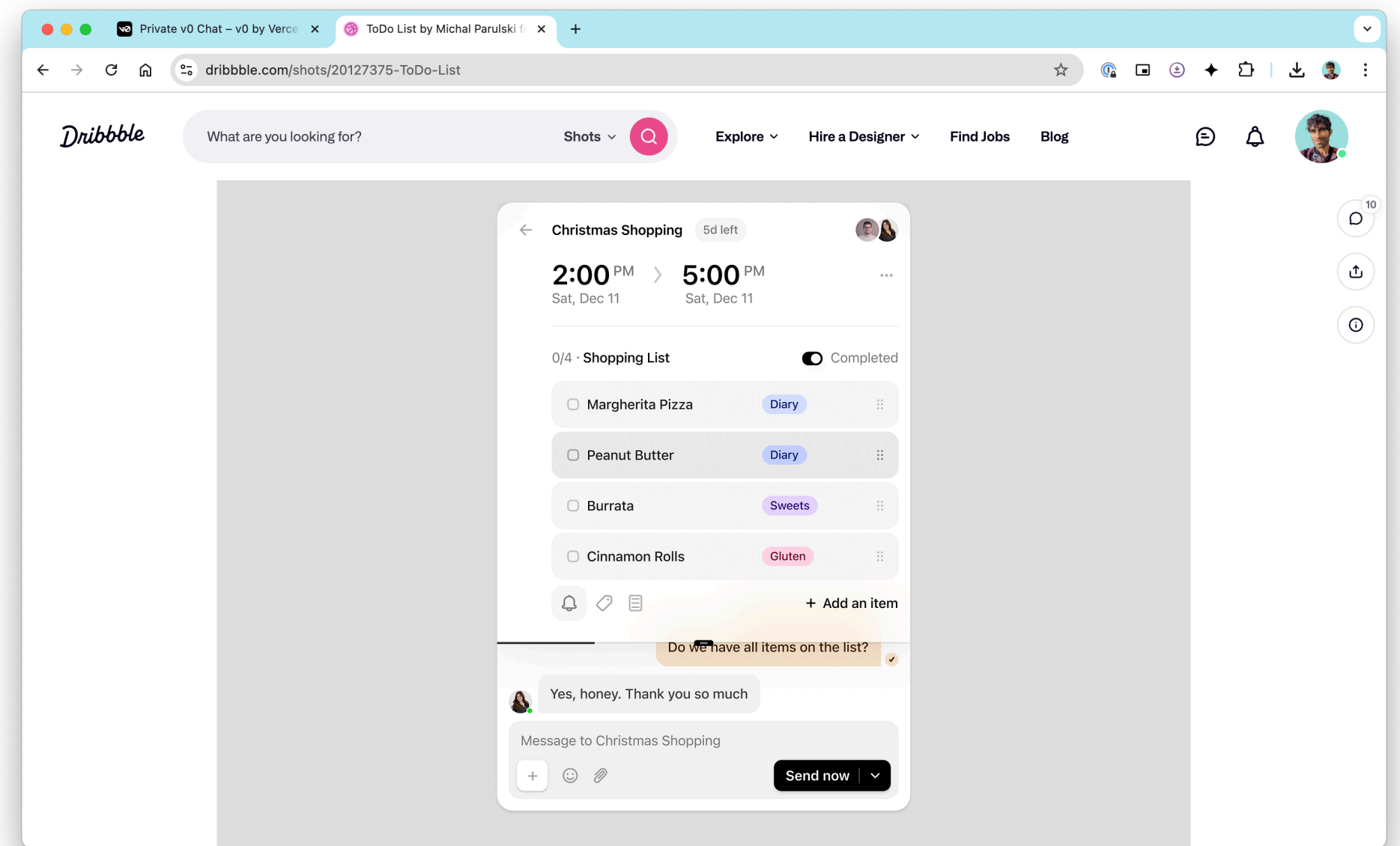


**READING CODE
BECOMES THE
JOB. BUILD
THIS MUSCLE.**

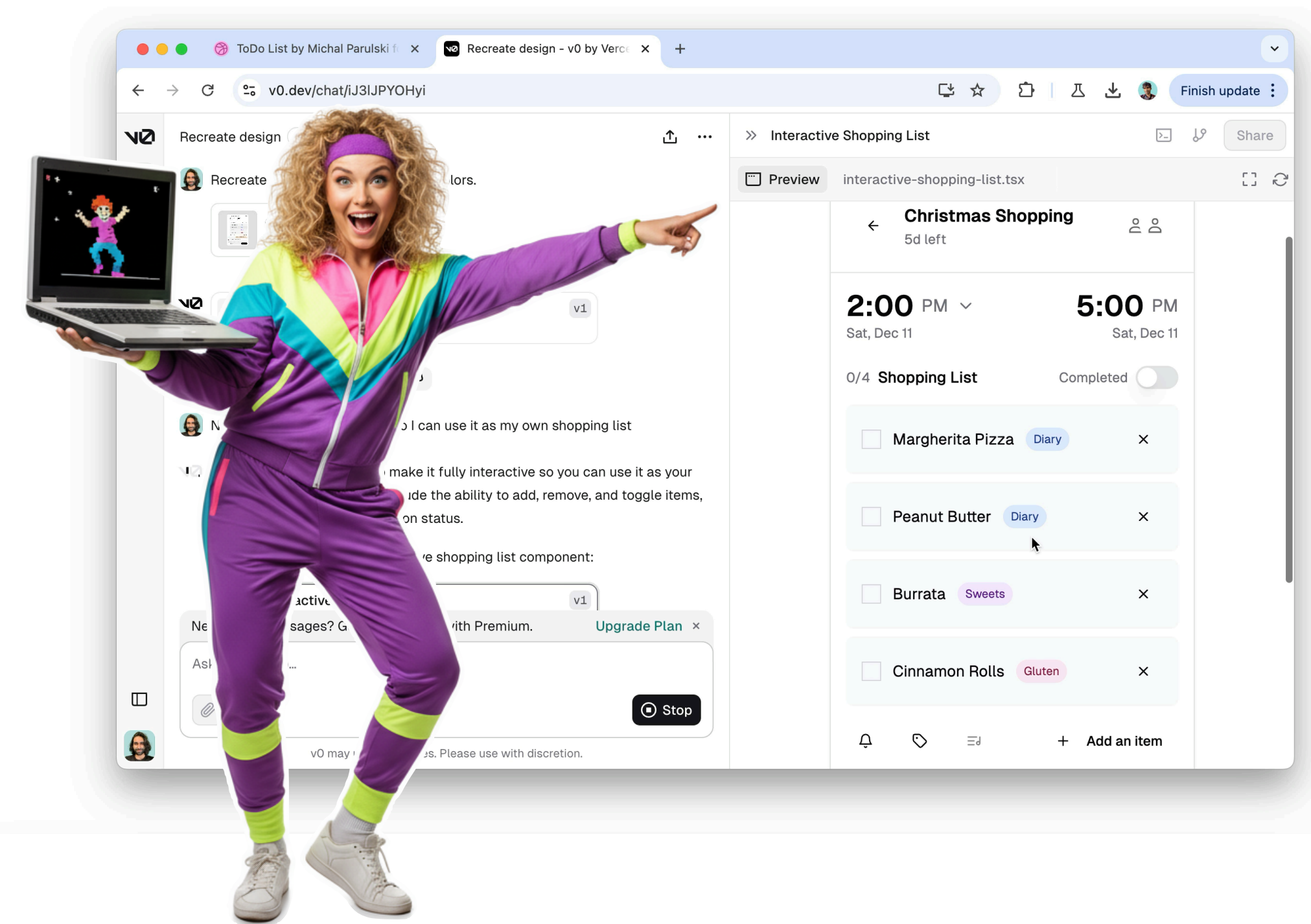
**YOU WILL ALWAYS READ
MORE CODE THAN YOU WRITE**



VIBE-CODING IS A GIFT FOR PROTOTYPING.



INTERACTIVE PROTOTYPES > STATIC MOCKS



SHOPIFY: AI AS CULTURAL CATALYST

LEADERSHIP-LED, INFRASTRUCTURE-FIRST,
DEMOCRATIZED ACCESS



Max Stoiber ✓
@mxstbr



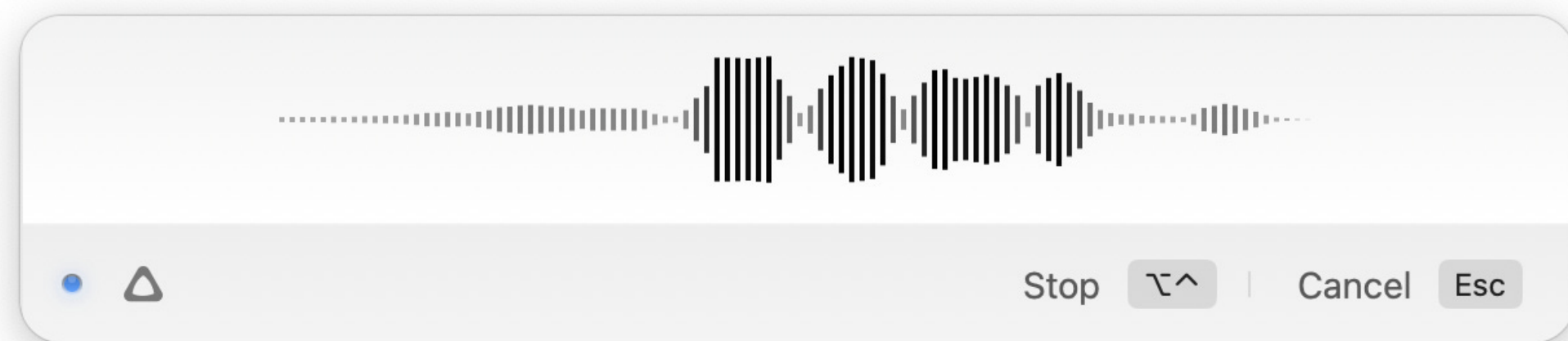
Design → dev handoffs are a thing of the past.

At [@Shopify](#), our designers vibe code prototypes of their ideas in playground/"baby" versions of the product. (h/t [@ryolu_](#))

They then work with devs to implement the prototypes for real.

There's no "handoff" along the way. It's one continuous stream of work and collaboration. One team.

VIBE CODE WITH YOUR VOICE



**SPEAKING PROMPTS ALOUD IS OFTEN FASTER THAN
TYPING. HUMANS SPEAK 3-5X FASTER THAN THEY
TYPE (150+ WPM VS. 40-80 WPM).**



AI IS A FORCE MULTIPLIER. WHAT HELPS THE HUMAN HELPS THE AI.

TESTS, LINTING, CI



TESTS ARE A **SAFETY NET.** THEY DE-RISK AI CODING.

**BTW...IF YOU PLAN TO USE AI FOR
WRITING TESTS, IT'S CRUCIAL TO ADOPT A
STRATEGY THAT EMPHASIZES HUMAN
OVERSIGHT**



AI REALITY CHECK

**WHAT THE DATA SAYS ABOUT
PRODUCTIVITY, TRUST, AND TEAM
VELOCITY**

Source 2025 DORA and Faros AI Productivity findings



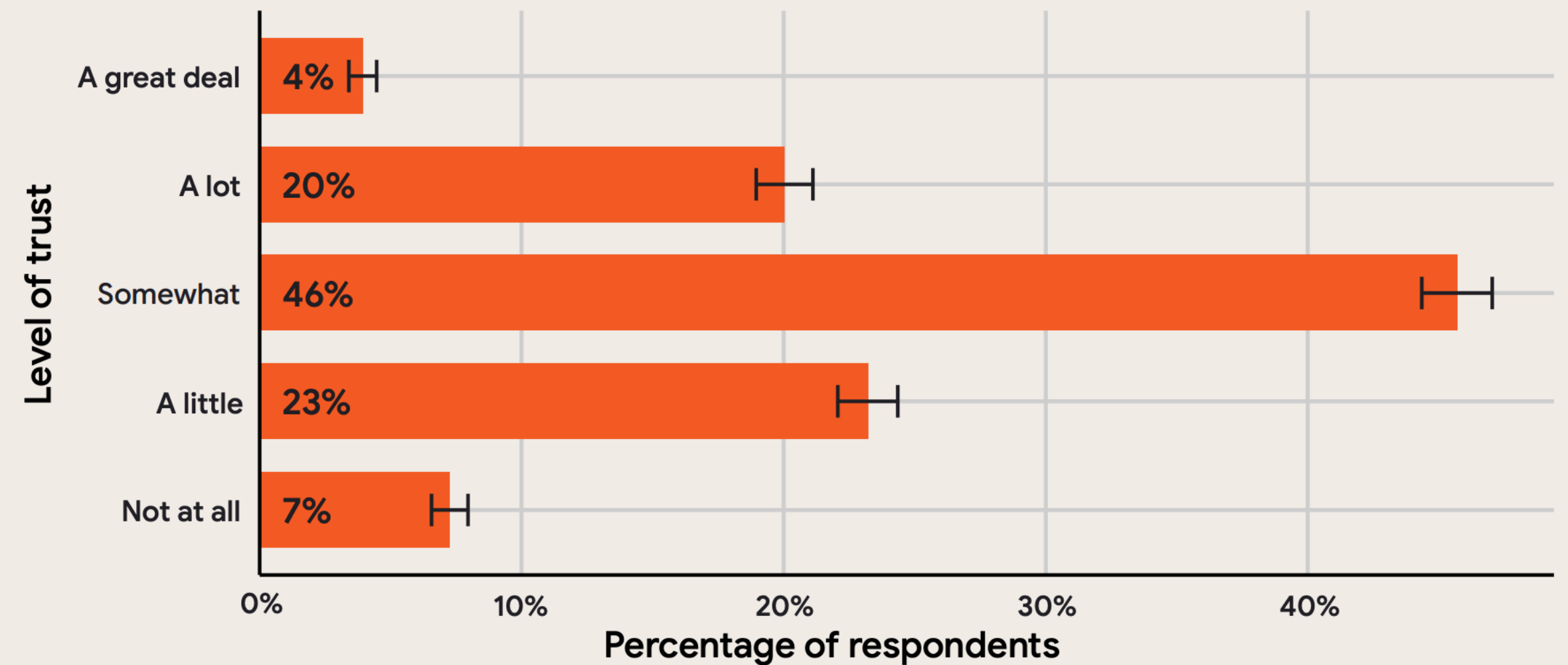
ADOPTION IS UP, TRUST IS DOWN

**FAVORABLE VIEWS FELL FROM 70 TO 60%
IN TWO YEARS**

46% ACTIVELY DISTRUST AI ACCURACY

**30% REPORT LITTLE TO NO TRUST IN AI
GENERATED CODE**

Trust in the quality of AI-generated output
Distribution of trust levels among respondents



DORA
v. 2025.1

VIBE CODING



VIBE DEBUGGING



**CHROME DEVTTOOLS
MCP LETS AGENTS "SEE"
AND INTERACT WITH
THE LIVE BROWSER
ENVIRONMENT.**

INDIVIDUAL **OUTPUT** IS SURGING

TASKS

**WITH AI CODING,
DEVELOPERS
COMPLETE 21%
MORE TASKS**

PRS

**MERGE 98%
MORE PULL
REQUESTS**

SENTIMENT

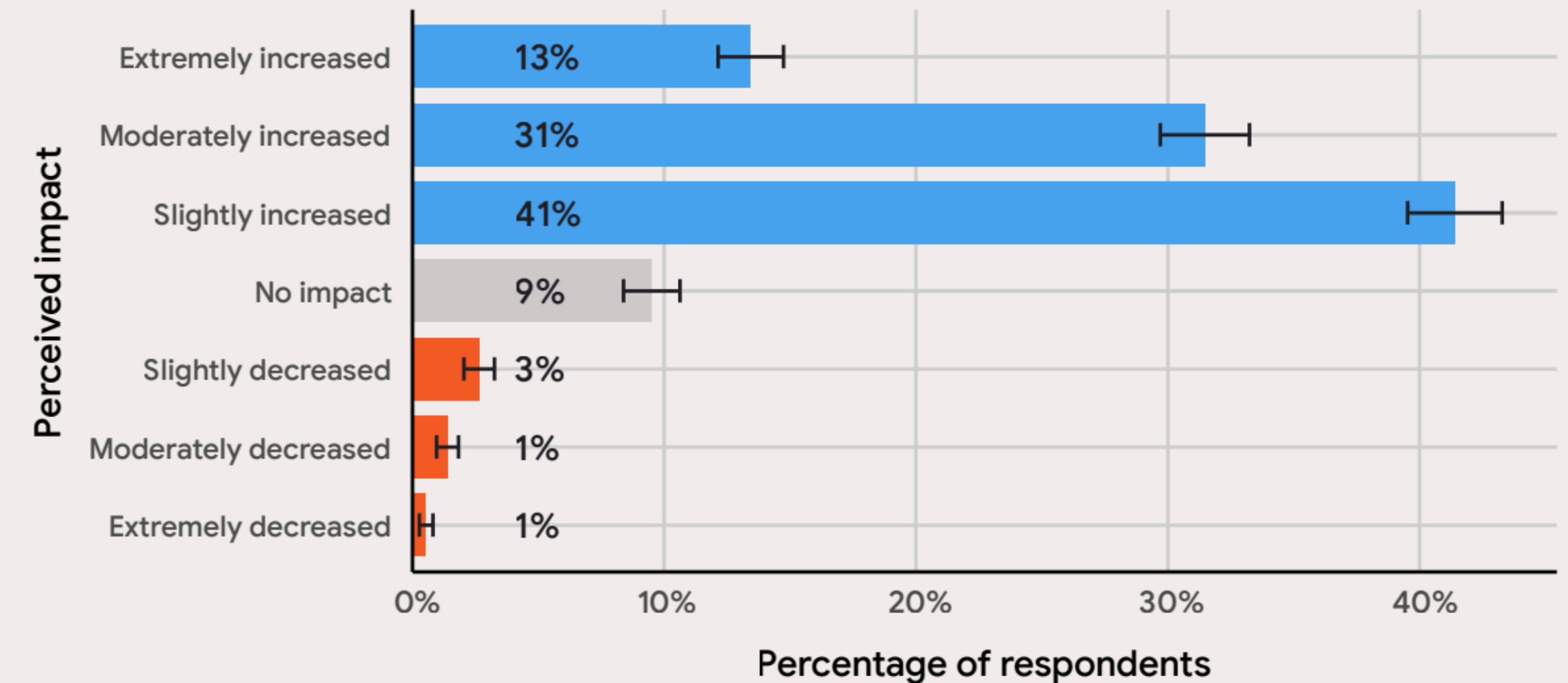
**OVER 80% SAY AI
HELPS THEIR
PERSONAL
PRODUCTIVITY**

2025 DORA/FAROS AI PRODUCTIVITY REPORT

**“I FEEL LIKE AI
SOMETIMES WRITES
BETTER CODE THAN
I DO FOR CERTAIN
THINGS, MAINLY
BECAUSE I FEEL LIKE
IT’S BEEN TRAINED
REALLY WELL”**

Perceived impact on individual productivity

Respondents’ assessment of how AI affects their productivity



Error bars show the 89% credible interval.

Figure 24: Perceived impact on individual productivity

WITH AI CODING
PULL REQUEST
REVIEW TIMES
INCREASED BY 91%

ALL PRODUCTIVITY GAINS ABSORBED BY HUMAN VERIFICATION

2025 DORA/FAROS AI PRODUCTIVITY REPORT

**TOP FRUSTRATION: ALMOST RIGHT CODE. 66%
CITE IT AS THE MAIN TIME SINK.**

**“AI SOLUTIONS THAT
ARE ALMOST RIGHT, BUT NOT QUITE,
ARE NOW MY BIGGEST TIME SINK. THE
CODE LOOKS PLAUSIBLE BUT I END UP
SPENDING MORE TIME FIXING THOSE
'HELPFUL' SUGGESTIONS.”**

WHERE AI HELPS MOST

LOW-CONTEXT, HIGH-REPETITION WORK

GREENFIELD AND PROTOTYPING

BOILERPLATE AND REPETITIVE CODE

UNIT TEST GENERATION

DOCUMENTATION AND SIMPLE API INTEGRATIONS

WHERE AI STRUGGLES

HIGH CONTEXT, NOVEL PROBLEMS

COMPLEX LEGACY CODEBASES

SECURITY CRITICAL IMPLEMENTATIONS

AMBIGUOUS REQUIREMENTS

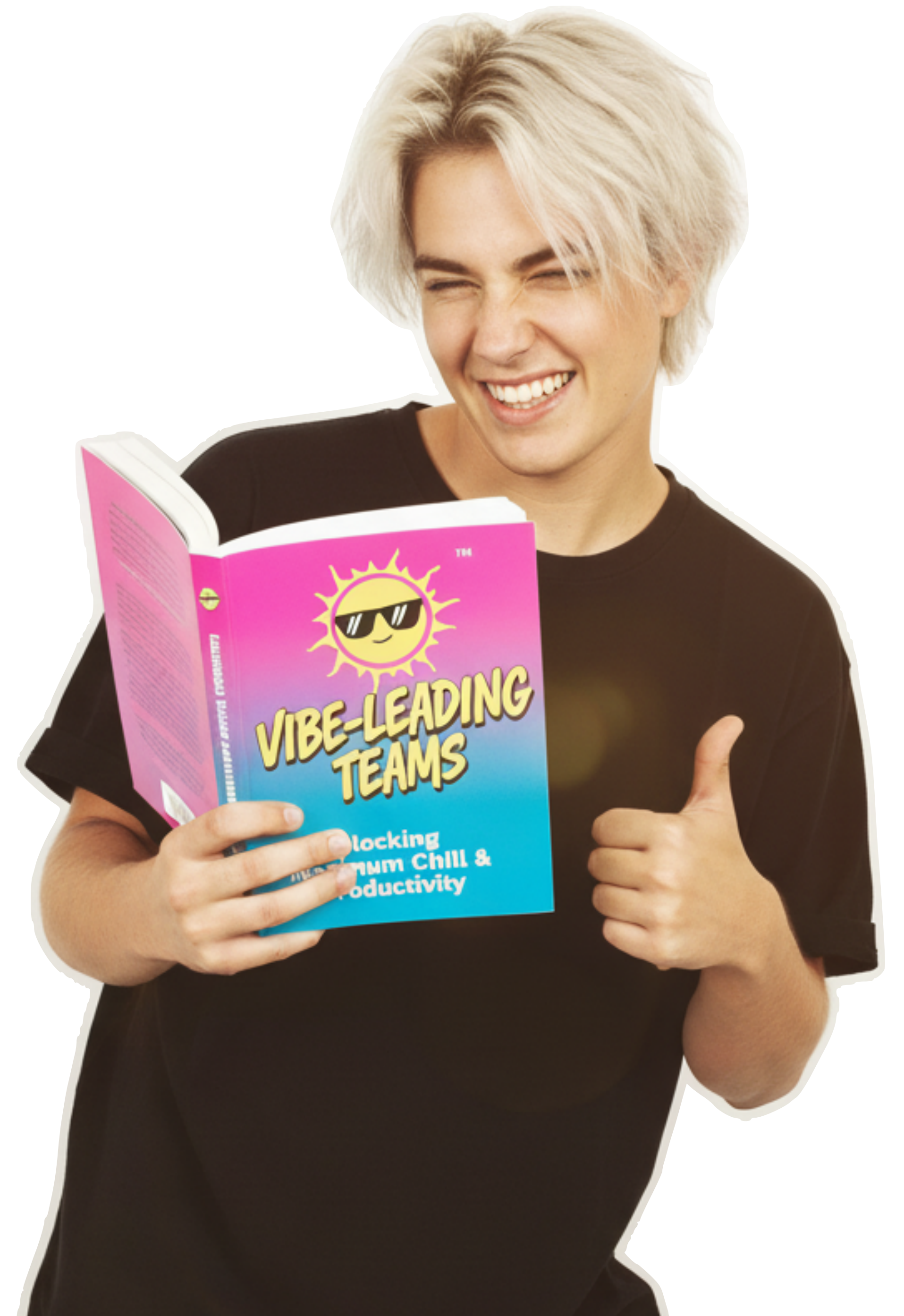
CROSS SYSTEM LOGIC



**KEEP VIBE-CODING. WE
CAN ALWAYS FIX IT LATER.**

THE LEADERSHIP PLAYBOOK

FOR AI-ASSISTED ENGINEERING



STRATEGY 1:
MITIGATE SKILL
EROSION.
GROW CRITICAL
THINKING.

```
> c
└─ Claude usage limit reached. Your limit will reset
   at 1:30am (Asia/Calcutta).

   • /upgrade to increase your usage limit.

>
▶▶ auto-accept edits on (shift+tab to cycle)
```



**SOFTWARE ENGINEERS ARE
PAID TO SOLVE PROBLEMS,
NOT JUST WRITE CODE.**

**BUILDING SOFTWARE IS 10%
CODING AND 90% CRITICAL
THINKING - A TASK YOU
CAN'T COMPLETELY DELEGATE
TO AN LLM.**

The 70% problem

This "70% problem" reveals something crucial about the current state of AI-assisted development. The initial progress feels magical: you can describe what you want, and AI tools like v0 or Bolt will generate a working prototype that looks impressive. But then reality sets in.

The two steps back pattern

What typically happens next follows a predictable pattern:



You try to fix a small bug



The AI suggests a change that seems reasonable



This fix breaks something else



You ask AI to fix the new issue



This creates two more problems



Rinse and repeat



Addy Osmani

Engineering leader at Google



The Pragmatic Engineer

Big Tech & startups - from the inside

THE 70% PROBLEM

SOMETIMES THAT
"LAST 30%" IS WHAT
THE SENIORS SEE AND
THE JUNIORS DON'T.

54% OF LEADERS EXPECT TO REDUCE JUNIOR HIRING

THE BAR IS RISING, THE ROLE IS EVOLVING

THE LEADDEV AI IMPACT REPORT 2025

EVOLVE CODE REVIEWS INTO LEARNING MOMENTS

SHIFT FOCUS FROM "DOES IT
WORK?" TO "DO YOU UNDERSTAND
WHY IT WORKS?"

test.js

Comment on lines +6 to 9

```
6 + const user = await getUserById(req.params.id);
7 + res.json({ name: user.name });
8 + });
```

5 9

 Copilot AI 3 days ago

Consider adding error handling (e.g. a try/catch block) around the async c
unhandled promise rejections.

Suggested change

```
6 - const user = await getUserById(req.params.id);
7 - res.json({ name: user.name });
8 - });
6 + try {
7 +   const user = await getUserById(req.params.id);
8 +   res.json({ name: user.name });
9 + } catch (error) {
10 +   console.error('Error fetching user:', error);
11 +   res.status(500).json({ error: 'Failed to fetch user' });
12 + }
```

 Open in Worksp

Copilot is powered by AI, so mistakes are possible. Review output carefully before use.

PAIR PROGRAMMING + AI = TRIO PROGRAMMING

SENIOR GUIDES STRATEGY, JUNIOR
DRIVES IMPLEMENTATION, AI
ASSISTS



REGULAR "NO-AI CHALLENGES" KEEP SKILLS SHARP

LIKE PILOTS TRAINING WITHOUT
AUTOPILOT—ESSENTIAL FOR WHEN
YOU NEED IT MOST



**AI'S BASELINE IS
"HEY, IT WORKS":
ENGINEERS MUST
ENSURE IT'S SECURE,
MAINTAINABLE,
AND PRODUCTION-
READY**

**MICROSOFT COPILOT STUDY: 26%
FASTER TASK COMPLETION WITH NO
QUALITY DEGRADATION**



STRATEGY 2: MEASURE WHAT TRULY MATTERS



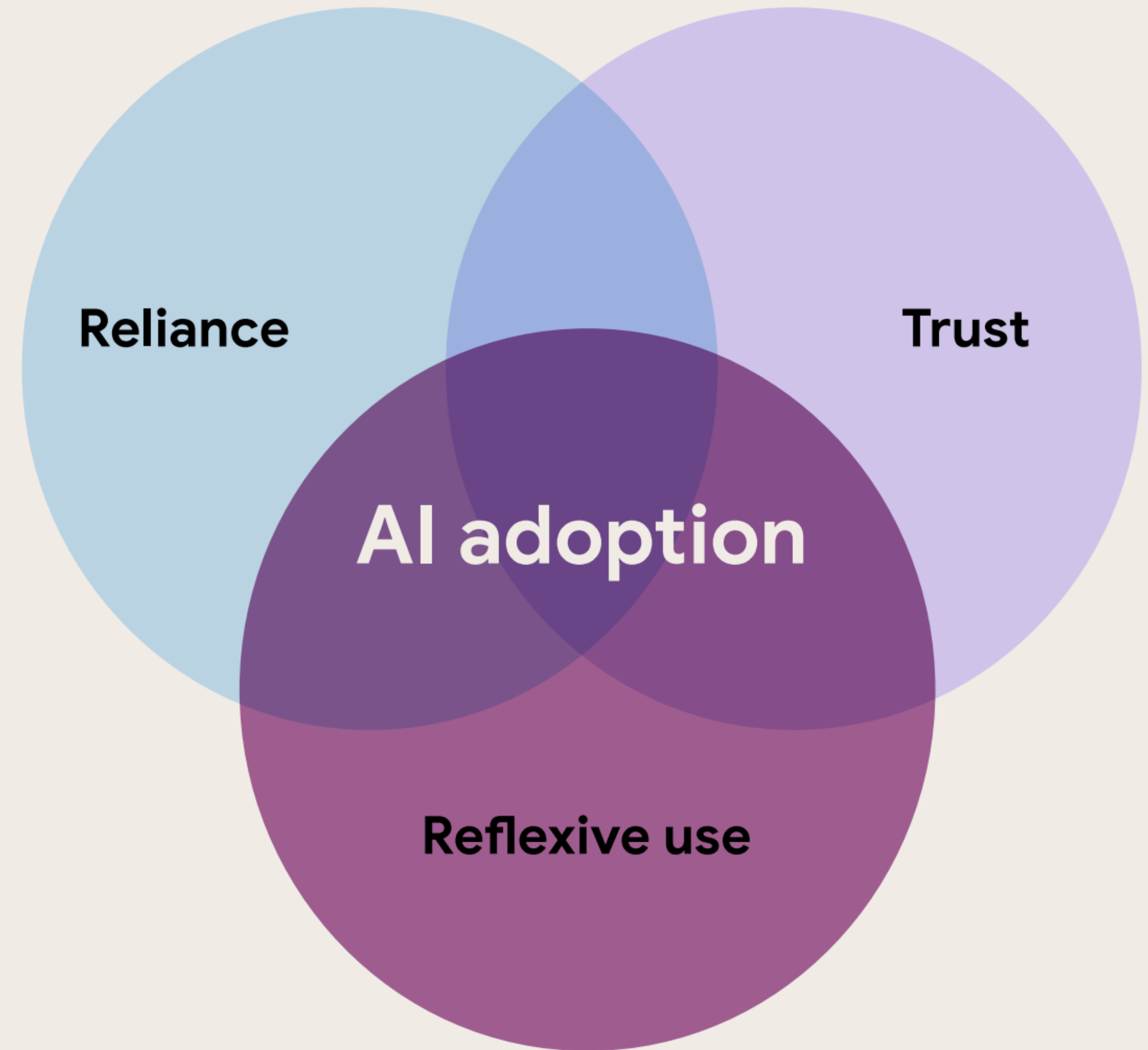
MOVE BEYOND VANITY METRICS TO MEANINGFUL INDICATORS

60% CITE LACK OF CLEAR METRICS AS BIGGEST AI CHALLENGE

ONLY 18% MEASURE IMPACT SYSTEMATICALLY

2025 LEADDEV AI IMPACT REPORT

**Items that
make up the
AI adoption
factor**



A THREE-PILLAR MEASUREMENT FRAMEWORK

THROUGHPUT & VELOCITY

**PULL REQUEST
CYCLE TIME IS
A TRUTH
TELLING
METRIC**

**MEASURE TOTAL TIME
FROM FIRST COMMIT TO
MERGE**

QUALITY & STABILITY

**CHECK
FAILURE
RATES AND
THE USER
EXPERIENCE**

**WHAT PERCENTAGE OF
DEPLOYMENTS REQUIRE
REMIATION?**

DEVELOPER EXPERIENCE

**QUALITATIVE
SURVEYS
REVEAL THE
HUMAN
STORY**

**"DID AI HELP YOU COMPLETE WORK FASTER THIS WEEK?"
"HOW CONFIDENT ARE YOU IN THE QUALITY OF CODE YOU
SHIPPED?"
"RATE YOUR FRUSTRATION LEVEL WITH CURRENT TOOLS"**

STRATEGY 3: ESTABLISH HUMAN- CENTERED GUARDRAILS

ENABLE SAFE EXPERIMENTATION WITH CLEAR BOUNDARIES

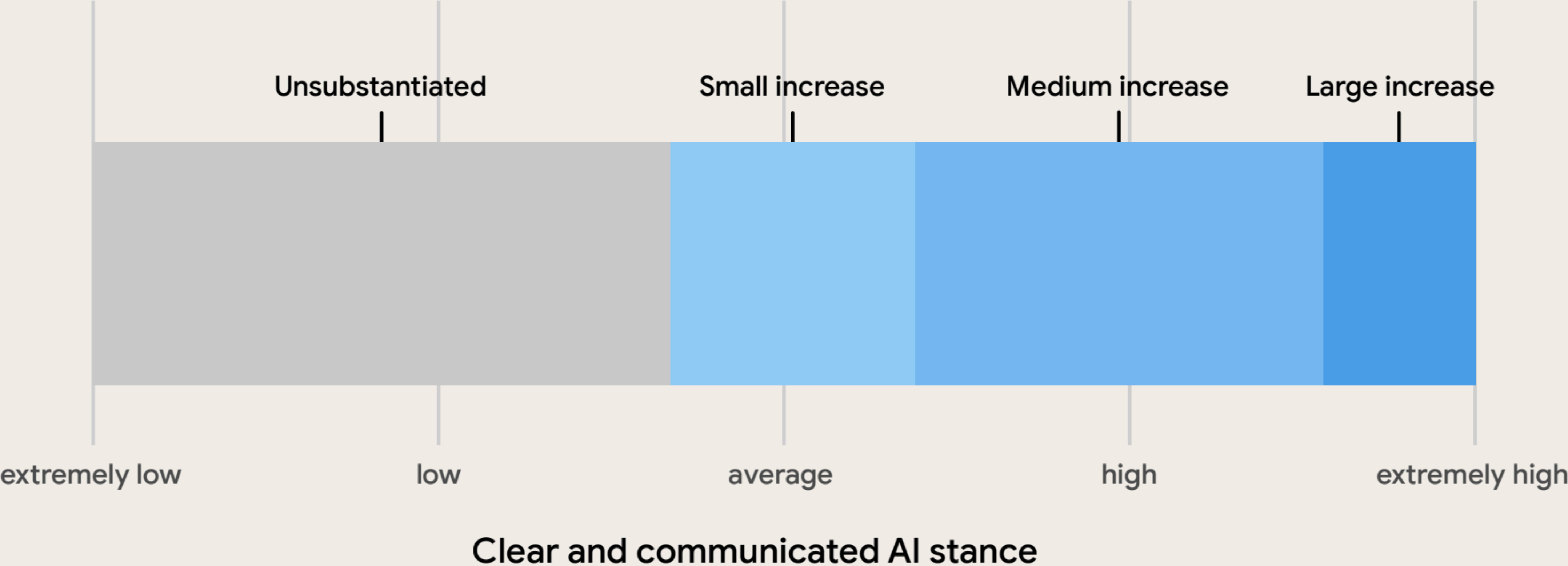


SAFETY STANDARDS BACK IN THE DAY



MOST DON'T KNOW THEIR COMPANY'S AI POLICY

A clear and communicated AI stance moderates AI's impact on individual effectiveness



LEADERSHIP'S ROLE : RESPONSIBLE AI USAGE

"SET **CLEAR AI BOUNDARIES**: NO PROPRIETARY CODE IN PUBLIC TOOLS, VERIFY LICENSING, MAINTAIN HUMAN ACCOUNTABILITY."

"**ESTABLISH AI POLICIES BEFORE PROBLEMS ARISE**. ETHICS, SECURITY, AND LEGAL COMPLIANCE CAN'T BE AFTERTHOUGHTS."

"YOUR JOB: **CREATE GUARDRAILS THAT LET TEAMS INNOVATE SAFELY WITH AI TOOLS**."

THE MOST VALUABLE SKILLS IN THE AI ERA

CRITICAL THINKING AND PROBLEM ANALYSIS

ARCHITECTURAL DESIGN AND SYSTEM THINKING

COMPLEX PROBLEM-SOLVING

CLEAR COMMUNICATION AND SPECIFICATION

**CHANGE
MANAGEMENT IS
AS IMPORTANT
AS TECHNOLOGY:
PEOPLE
PROCESS, AND
CULTURE.**



The Managing Complex Change model was created by Dr. Mary Lippitt (1987).

@addyosman



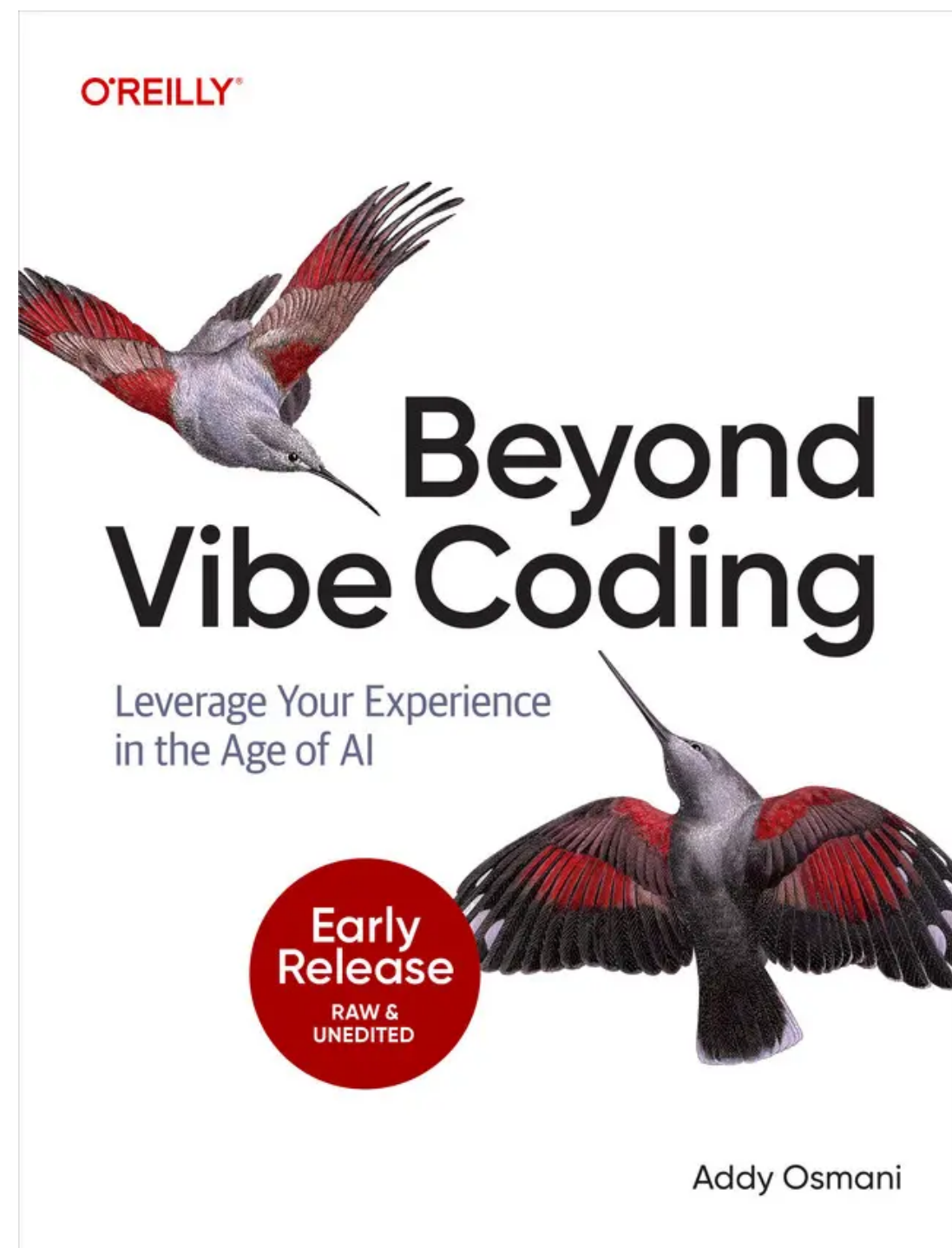
You're
absolutely right

**USE AI TO BUILD BETTER
SOFTWARE FASTER BUT
ALWAYS WITH HUMAN
OVERSIGHT, CREATIVITY
AND PURPOSE GUIDING
THE WAY**

QUESTIONS & DISCUSSION @ADDYOSMANI

THANK YOU & LEARN MORE

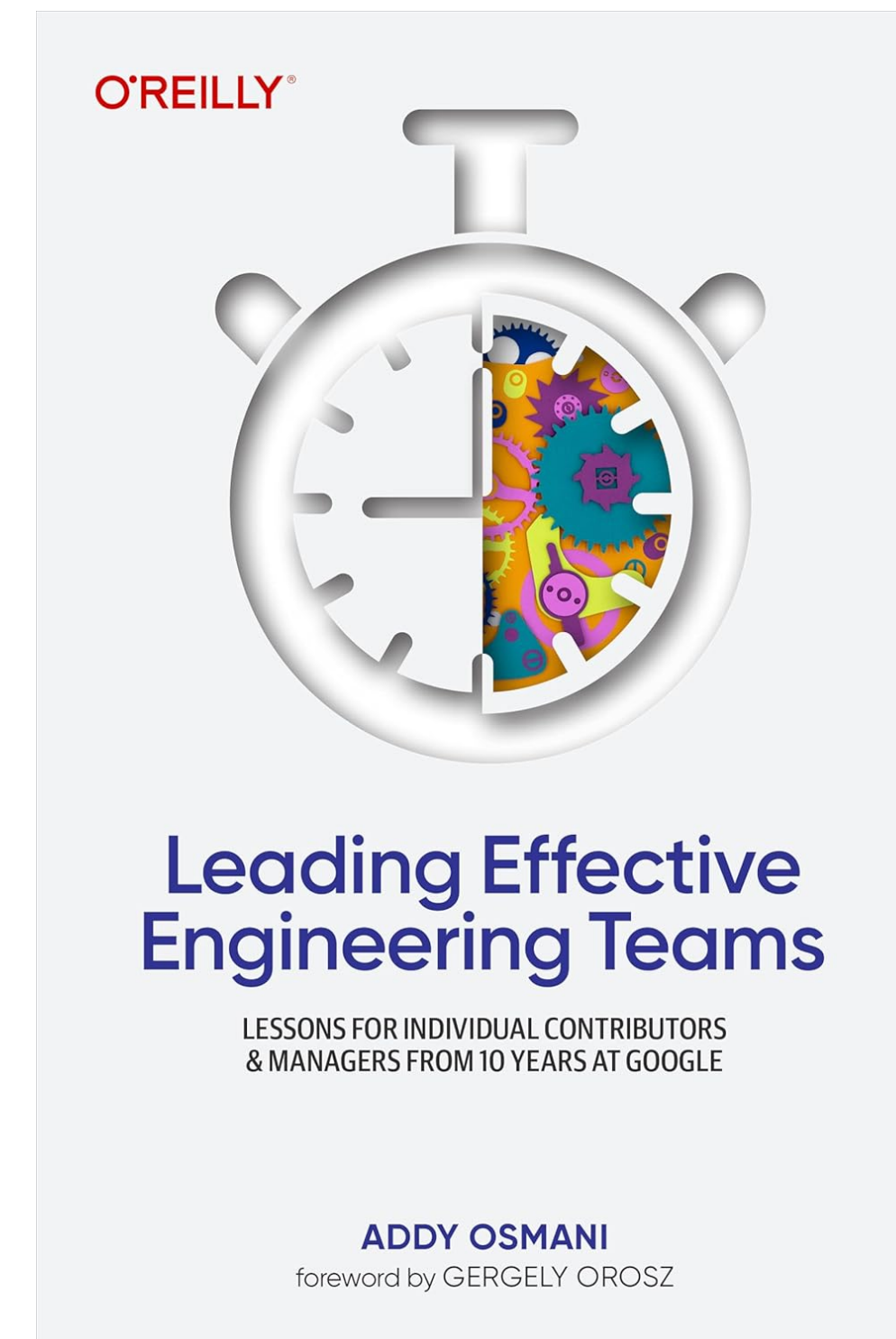
ADDYOSMANI.COM



**BEYOND VIBE
CODING**



**BUILDING WEB
APPS WITH BOLT**



**LEADING EFFECTIVE
ENG TEAMS**