



AI Agents: *End 2025 Update*

December 11th, 2025

What's An Agent?

- 2025's most hyped AI term
- “Agent” means someone or something that does work on your behalf
- AI Agents are AI systems that do work for you – automatically.

Why We Care

- AI Chatbots are like other software – helping get a narrow task done
- AI's promise to really support productivity and expand capability comes from doing work for us – thus Agents

“Agents” Aren’t That New

- For years, IT teams have connected steps in software systems with “Robotic Process Automation” or **RPA**
- This meant connecting very well defined tasks to each other to automate something pretty simple – usually it was just routing data or documents from one approval step to another.

RPA Example: Invoice Processing

Manual Process

AP team:

- Downloads the invoice from email.
- Checks it against the PO or delivery ticket.
- Codes it to the correct job and cost code.
- Enters it into the accounting system (Foundations, QuickBooks Desktop/Online, Sage 100/300, Viewpoint Spectrum).
- Sends it to the project manager or foreman for approval.

RPA

- **Trigger:** Vendor invoice is emailed to AP team
- **Bot Action 1:** The bot reads key fields from the invoice
- **Bot Action 2:** The bot checks the vendor invoice against PO or delivery ticket
- **Bot Action 3:** Enter into Accounting System
- **Bot Action 4:** Route to Approver
- **Bot Action 5:** Auto-Reminders and Filing

Agents vs. RPA Mirrors AI vs. Traditional Software

- **Agents understand messy inputs and context.**
 - They interpret any invoice format, infer missing job/cost codes, read delivery tickets or emails, and handle variation that breaks RPA.
- **Agents reason through exceptions.**
 - They detect mismatches, retrieve supporting documents, ask questions, and decide next actions the way a human would.
- **Agents coordinate across systems without brittle scripts.**
 - They navigate email, accounting, storage, and PO systems dynamically, adapting to layout changes and incomplete data.
- **Agents learn and improve.**
 - They pick up vendor patterns, approval bottlenecks, and cost-coding habits over time to reduce errors and accelerate processing.

Agents Open Up Real Work to AI

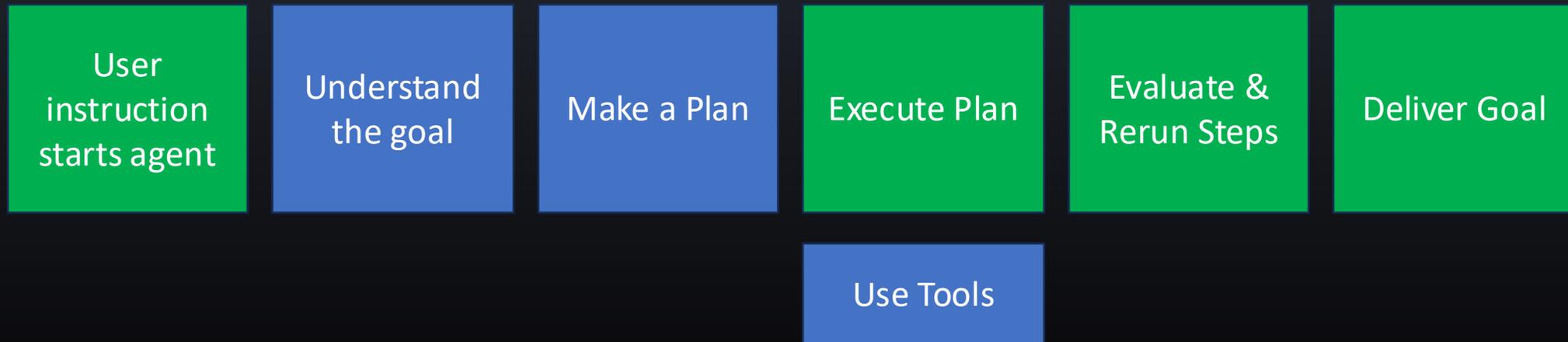
- RPA has limited applications – only very stable, highly repetitive tasks.
- Agents can be applied to a growing number of tasks that are well defined but have widely varying inputs

From AI Assistants to AI Agents

- Assistants – basically chatbots connected to software, are going to be in everything
 - Procore
 - Autodesk
 - Kahua
 - Bluebeam
 - Stratus (not quite an assistant, they have functions distributed throughout the platform)
- Assistants are good at answering lookup questions
- Agents take this a step further and do work

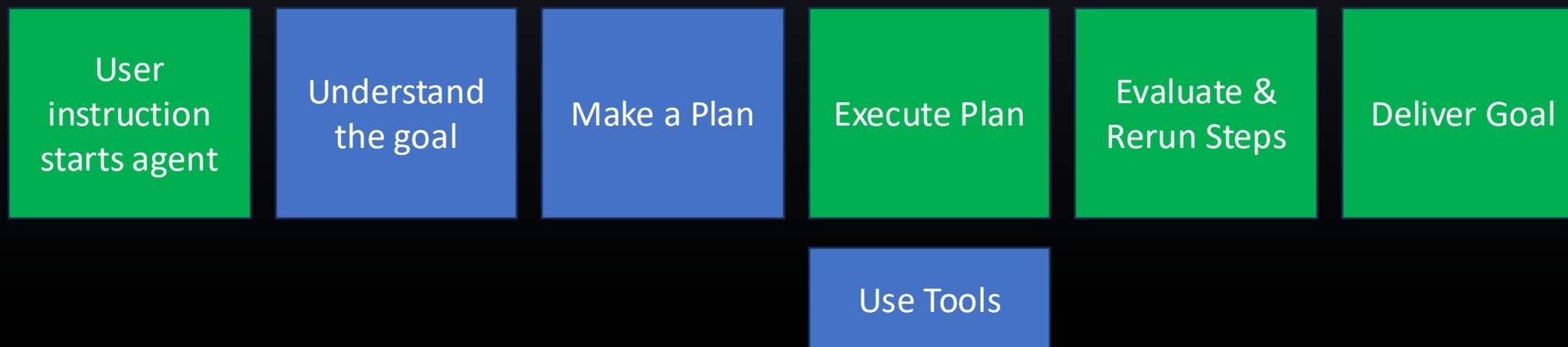
How Agents Work

**Not all agents do all of this*



Current Agents

- Most only do the green steps: natural language instruction + executing & delivering
- What makes them an agent is they do multiple steps, and evaluate & rerun steps.



“Deep Agents”

- Specialized agents that can take a goal, create and execute a plan
- Deep Research is the most common (ChatGPT, Claude, Gemini, Others)

What That Looks Like

The image shows a user interface for an AI research tool. On the left is a chat window with a 'Start research' button and a response from the AI. On the right is a detailed report outline titled 'Deep AI Agents Report Outline' with a 'Show thinking' dropdown and a close button. The report outline is divided into three sections: 'Defining the Research Topic', 'Structuring the Report', and 'Strategy for Initial Search', each with a detailed paragraph of text. At the bottom of the chat window, there is a text input field and a 'Thinking' status indicator.

Start research

◆

OK, starting now. As soon as your report is ready, I'll let you know. In the meantime, feel free to leave this chat.

Deep AI Agents Report Outline
Researching 22 websites...

What do you want to research?

+ × Thinking ▾

Deep AI Agents Report Outline | Show thinking ▾ ×

◆ **Defining the Research Topic**

I am beginning my research on the topic of "Deep AI Agents." My initial thinking suggests this term is likely a descriptive umbrella for advanced autonomous agents that utilize Deep Learning and Large Language Models (LLMs). The term "Deep" may refer to the underlying Deep Learning architecture or their advanced capabilities, such as performing deep, iterative research. I need to first confirm the exact definition and whether it refers to a general concept or a specific product, such as one potentially developed by the company DeepAI, given the prominence of this name in the AI space.

Structuring the Report

To build a comprehensive report, I've outlined key areas that need investigation. This includes establishing the core architecture (e.g., how LLMs, memory, and planning algorithms like ReAct are used), identifying leading frameworks and platforms (like AutoGen or proprietary systems), cataloging their current capabilities and real-world applications (from software engineering to enterprise workflows), and critically examining the major challenges they face, such as reliability, hallucination, and security risks. I will also be looking for insights into the future trends shaping this field.

Strategy for Initial Search

My immediate next step is to execute a broad search to anchor the terminology and gather the latest landscape view. This involves searching for the precise definition of "Deep AI Agents," assessing the overall 'State of AI Agents' as of late 2025 (to ensure relevance to the current time-frame), and checking for any specific agent products released by DeepAI or any related architectural advancements published this year. This approach will provide the foundational knowledge needed to guide subsequent, more focused inquiries.

Researching websites

How Deep Agents Help

- Use normal language to tell the deep agent what you want
- It will have an area of expertise – research reports, databases, specialized software analysis, etc.
- Automates the grunt work of finding, reviewing, gathering and summarizing huge amounts of information

Why Agents Are Hard

- AI is useful because it can handle fuzzy inputs – it does not require instructions or data to be exactly right
- This can lead to fuzzy outputs – which the next step in an agent's process can handle...*but*
- When you have fuzziness in multiple steps, the agent will drift and deliver something other than what you want

The Telephone Game

If each step is too fuzzy, we go from correct to incorrect:

- Alice: "Let's meet at **3:15 p.m.** at **Main Street Café** on **Tuesday.**"
- Bob tells Carol: "We're meeting at **3:30 p.m.** at **Main Street Café** on Tuesday."
- Carol tells Dan: "We're meeting around **3:30** at that **Main café on 3rd Street** on Tuesday."
- Dan tells Emma: "Meet at **3:30** at the **café on 3rd Street** on **Thursday.**"

How Do We Fix This?

- We want flexibility, but not too much
- A three step loop:
 1. Create guardrails
 2. Run step (or full agent)
 3. Evaluate output
Back to step 1

2025 Was The Year of Evaluations

- Startups and cloud providers like AWS all created systems to evaluate AI outputs, in agents or otherwise
- Huge strides in making evaluations scale
- “Agent harnesses” innovated to provide a platform to build agents.

Use Case Examples

- **Daily Submittal Tracker**

- Monitors Procore/Kahua submittals, flags overdue items, drafts reminder emails.

- **Shop Drawing Intake Agent**

- Reads incoming drawings, extracts revision dates, affected systems, and required approvals.

- **Material Takeoff Verifier**

- Checks takeoff spreadsheets for missing line items against spec sections and typical scope lists.

Use Case Examples

- **Coil/Sheet Inventory Monitor**

- Pulls ERP inventory nightly, highlights low stock, and drafts purchase recommendations.

- **RFI Drafting Helper**

- Detects scope gaps or ambiguous details in PDFs and proposes short RFI text for review.

- **Fab Ticket Consistency Checker**

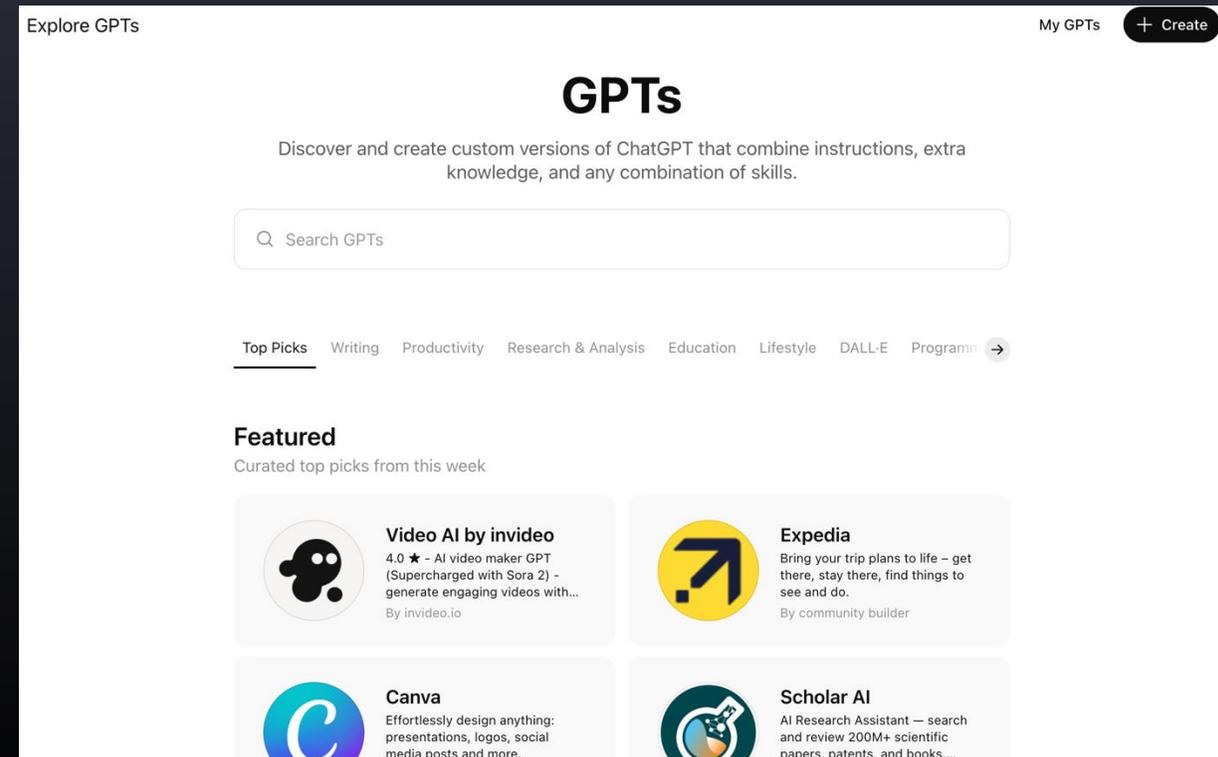
- Compares fab tickets to coordinated drawings; identifies mismatched dimensions or gauges.

Use Case Examples

- **Delivery Schedule Agent**
 - Reads GC's two-week look-ahead, extracts dates relevant to duct or metal panel drops, and updates internal schedule.
- **Safety Documentation Agent**
 - Ensures required JHAs/SWPs for sheet-metal tasks are present, up to date, and attached prior to site arrival.
- **Closeout Binder Compiler**
 - Automatically assembles warranties, O&M sheets, and cut sheets into a structured closeout package.
- **Change-Order Scope Scanner**
 - Reviews bulletins/ASI packages, flags likely sheet-metal impacts, and drafts scopes for pricing.

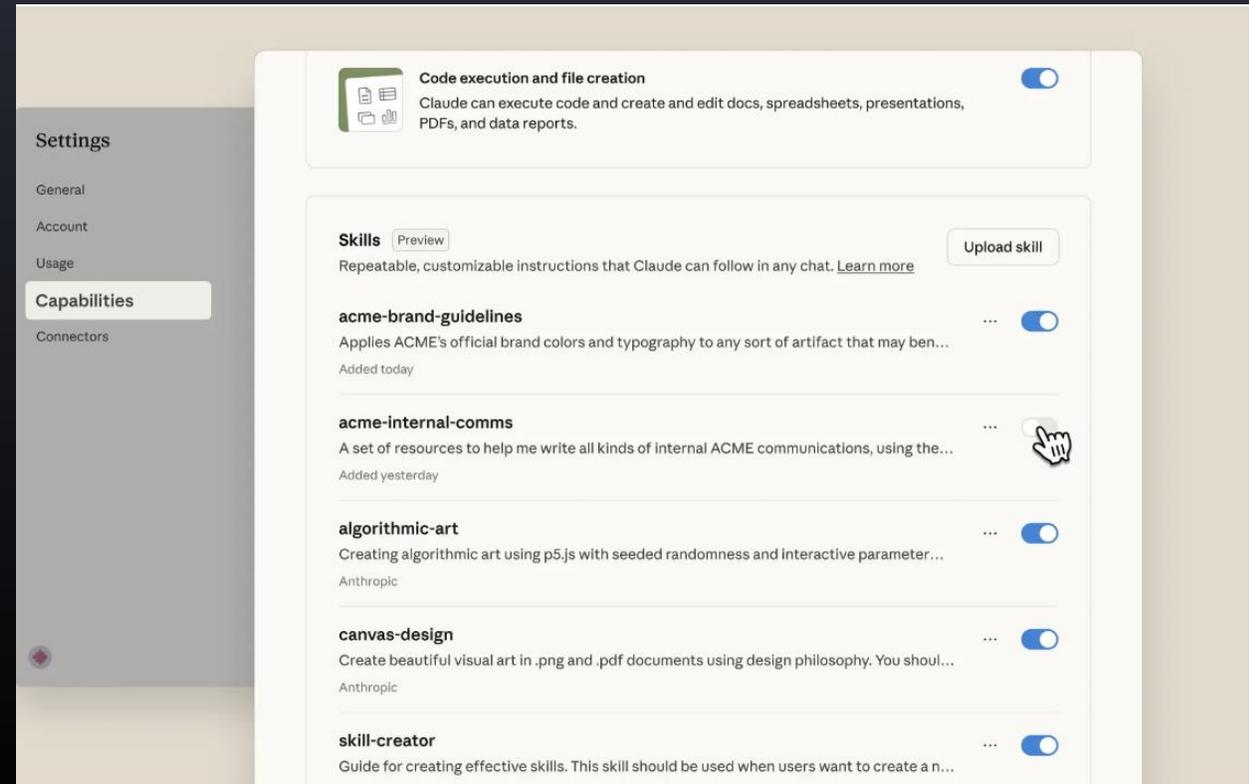
How You Can Make Agents Now

- Custom GPTs
 - You can connect a ChatGPT “Custom GPT” to different systems, and have it perform Deep Agent-like work
 - Have ChatGPT give you step by step instructions
 - Have ChatGPT write a prompt, and re-write the prompt as you go through evaluations & need to correct the system



How You Can Make Agents Now

- Claude “Agent Skills”
 - These are packages of instructions and documents that Claude can use in an agent-like way
 - Skills are technical, not as easy to do for non-developers



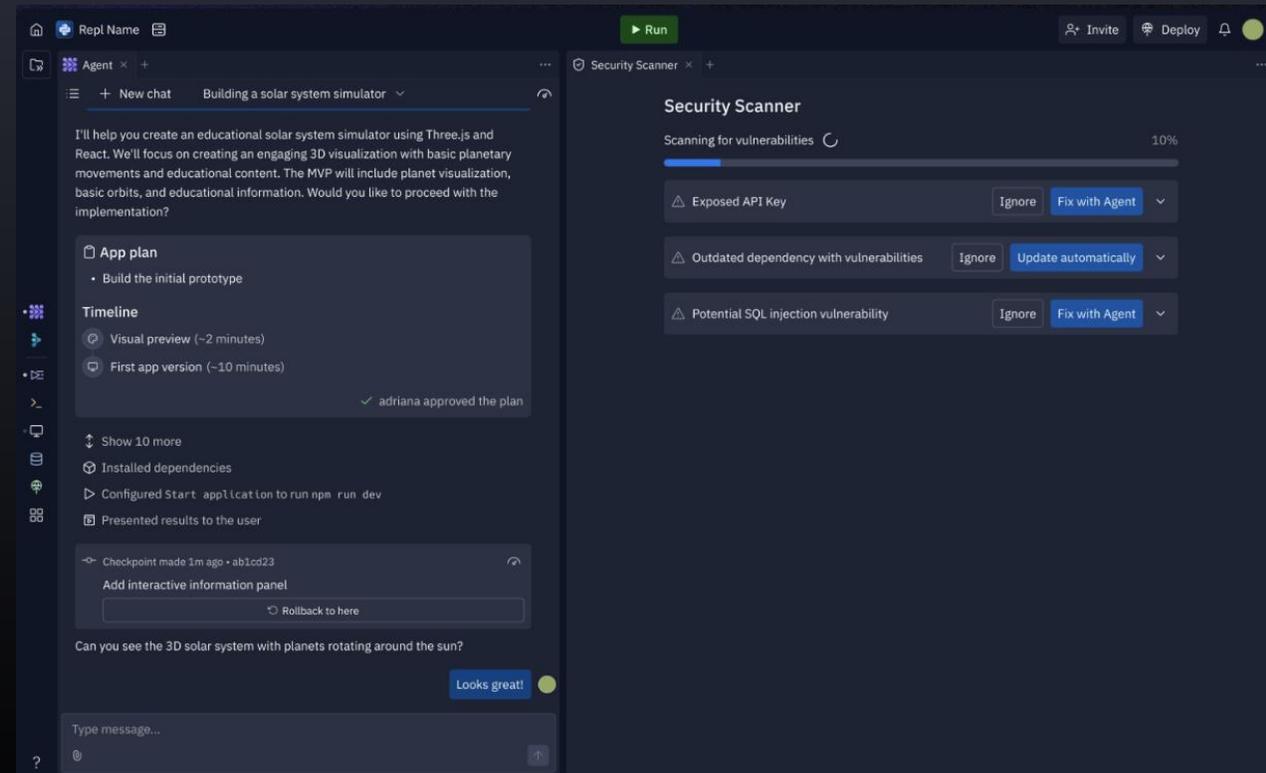
How You Can Make Agents Now

- N8N or Make.com
- Configuration platforms that allow you to connect systems, write simple rules, and have AI either manage or produce content



How You Can Make Agents Now

- Vibe-coding
- Use a natural language coding platform like Replit to create an agent from scratch
- Most technical option, requires *patience*



Don't Agent Alone

- If you or a team member would like to try creating agents, do it with a chatbot as your partner
- Tell the chatbot what you want, have it create a click by click plan
 - Be sure to tell it the current date and remind it to look at the latest documentation
 - Be sure to tell it that if it does not know the answer, to just tell you, not make up an answer

2026 Predictions

- Across the software landscape, agents will become more reliable, more useful, and more common
- Everyone is working out how to make agents – it will become common place
- Expect small and large automations in almost all software you use by end of 2026
- Also expect to be able to tell your software what you want
- Also expect to need to re-tell your software what you want!

Note on Using Agents

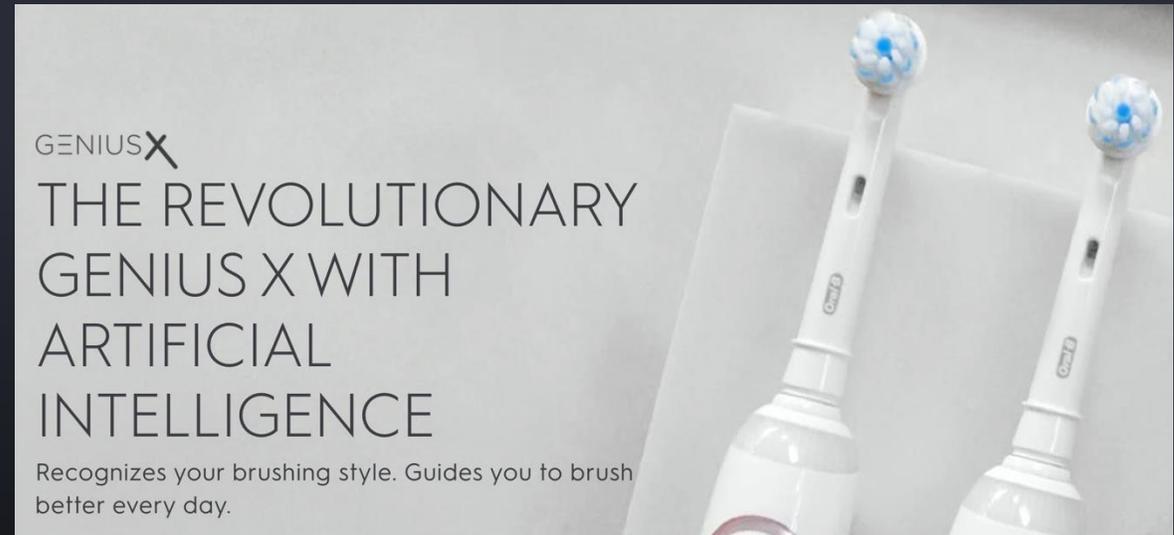
- They do not know what you know, unless you tell them
- They do not know what “good” looks like, unless you tell them
- We’re going to learn what agents need us to tell them that’s different from a human – they have different blindspots
- It is not pure incompetence, it is an AI-specific pattern we’ll all learn

Is AI Good Enough Now?

- There is a balance between the intelligence of the agent, and the software we scaffold it with
- With the right scaffolding, current AI is good enough now
- As AI gets more powerful, the scaffolding will be less necessary

AI Everywhere

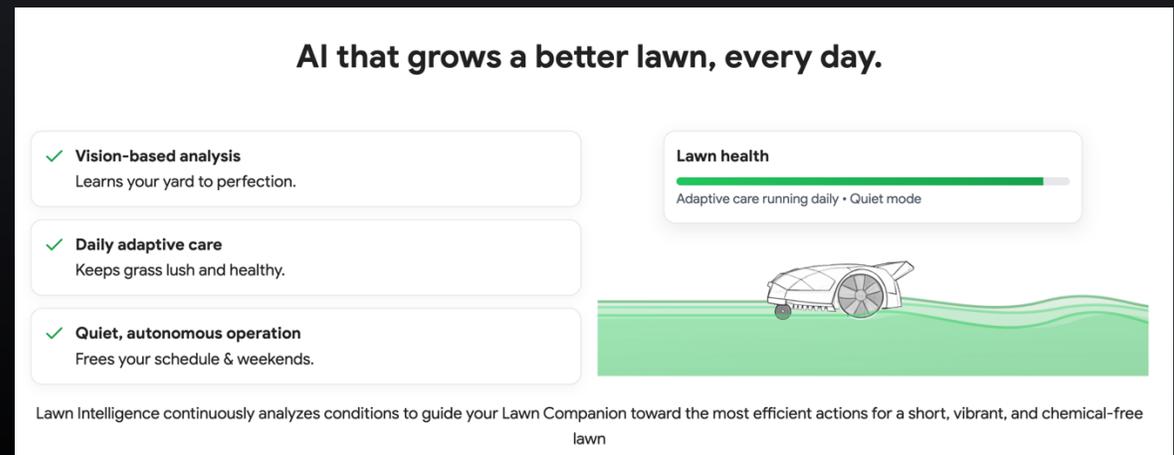
- Expect to see AI, either as an assistant, an agent, or some mix of these, to show up in almost everything
- Learning to work with this new 'species' will be essential



GENIUS X
THE REVOLUTIONARY
GENIUS X WITH
ARTIFICIAL
INTELLIGENCE

Recognizes your brushing style. Guides you to brush better every day.

The advertisement features two Oral-B Genius X electric toothbrushes with blue and white bristles, set against a light grey background. The text is positioned to the left of the toothbrushes.



AI that grows a better lawn, every day.

- ✓ **Vision-based analysis**
Learns your yard to perfection.
- ✓ **Daily adaptive care**
Keeps grass lush and healthy.
- ✓ **Quiet, autonomous operation**
Frees your schedule & weekends.

Lawn health
Adaptive care running daily • Quiet mode

Lawn Intelligence continuously analyzes conditions to guide your Lawn Companion toward the most efficient actions for a short, vibrant, and chemical-free lawn

The advertisement features a white lawn robot on a green lawn. The text is arranged in a clean, modern layout with green checkmarks and a progress bar for lawn health.

Bonus Section: AI 2025 Overview

Started with ChatGPT + Claude

- In January of 2025, ChatGPT was by far the leader
- Some had heard of Claude, most had not

Then Came the Chinese

- DeepSeek "moment" in end of January
- Showed that China was in the game
- Fake numbers led to questions about AI investment

- The big takeaway is that there are more than 2 horses in the race

Images Became Amazing

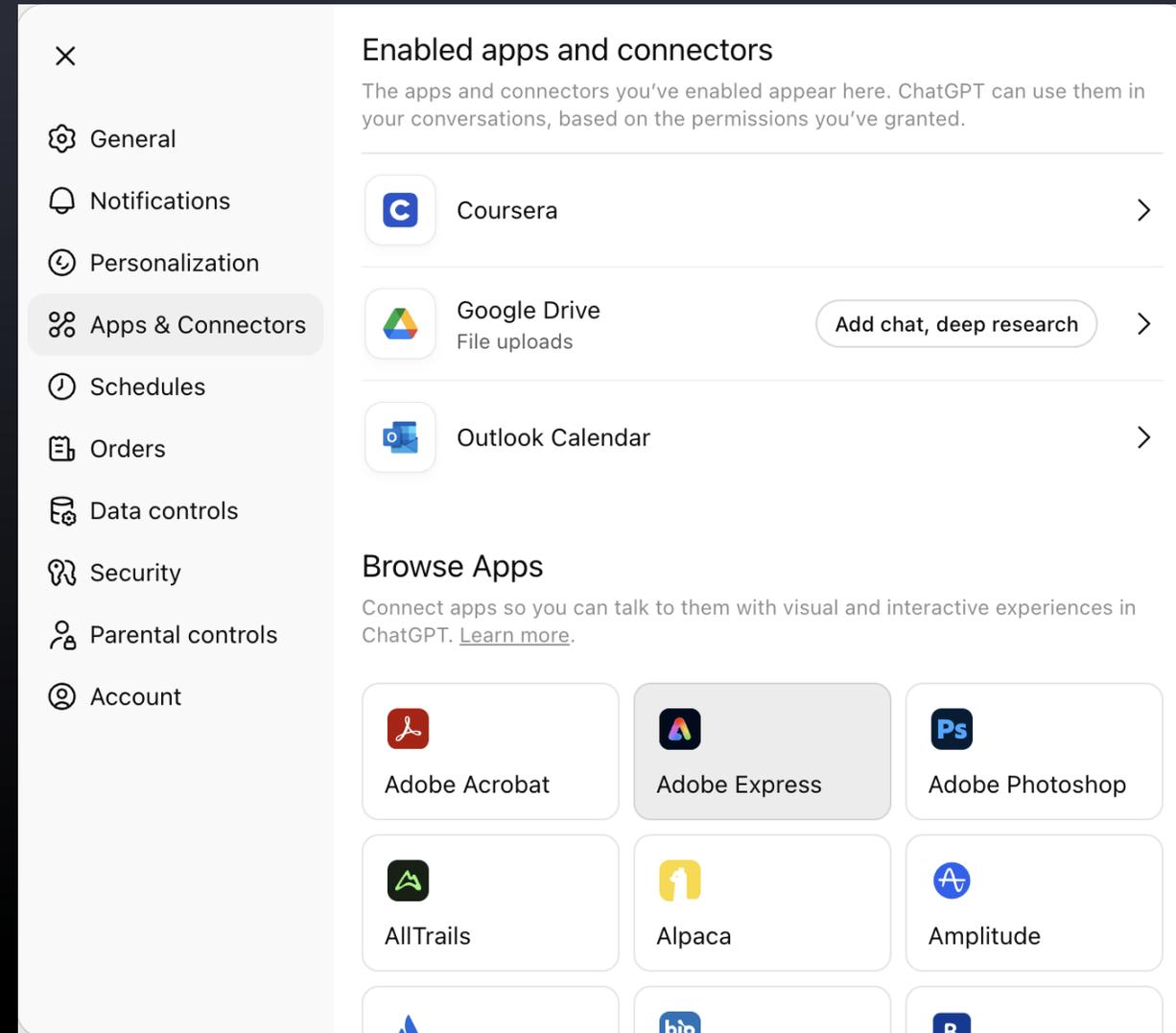
- ChatGPT imagegen in April
- Gemini Nano Banana in October
- You can now create, change, combine images at will

Chatbots Got Connected

- Led by ChatGPT, but based on Claude's MCP standard, Chatbots now connect to apps, databases and other software

Still early, but this will lead to Chatbots as a single interface to manage many other software products

ChatGPT has 61 Apps and Connectors!



Datacenter Investment Left Reality Behind

- \$400Bn in 2025
- \$4-600Bn in 2026 & 2027
- OpenAI alone is booked for \$1.3Trillion in the next 4 years
- Most investment is from balance sheets, except OpenAI

Google Dethroned OpenAI

- Launch of Gemini 3.0 re-established Google as a player
 - Added 200 million active users in a month
 - Integrated their AI into a bunch of products:
 - NotebookLM – manage writing, notes, audio recaps
 - AI Studio – create software, other things
 - Gemini App – main chatbot
 - Google docs
 - Others...
- If you haven't tried Google's image tool, you should (it's now in photoshop)

What to Look For in 2026

- Everything will get more useful
- 2025 was the start of real product development
- 2026 will see a flood of better AI experiences
 - We will also see AI start to disappear into products, you won't care if it's AI, it'll just be easier

“it's called AI until it works”



Have Questions About AI? SMACNA AI Office Hours Now Available!

Book an appointment with Hugh Seaton, SMACNA's AI Consultant, to answer your questions about this emerging tool.

Do you have questions about AI? Whether you are just starting, need help with troubleshooting, or want to talk strategy, SMACNA members can now connect with our AI specialist for support. No question is too simple or too advanced. Hugh Seaton is available for appointments to help you explore how AI can benefit your company and shape the industry.



Latest Articles

[Experience the Power of the SMACNA & SMART Partnership at AHR Expo 2026](#)

Dec 10, 2025 - Register for the AHR Expo in Las Vegas and visit SMACNA and SMART's joint booth (C3118) to learn how the organizations are advancing a stronger, more innovative unionized HVAC and sheet metal industry....



Questions?

Hugh Seaton, AI Consultant

hugh.seaton@quantumrise.com