

Deep Research: Agentic AI Focused on In-Depth Research Paper Development

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As Generative Artificial Intelligence (GenAI) has matured since it exploded on the scene with the release of ChatGPT on November 30, 2022, the number of models and options from the primary solution providers has expanded. Where once you may have said, “I used ChatGPT to look up information,” you now have to qualify which model – or at least which specialization – you are using. This article focuses on a specialization known as “Deep Research,” an “agentic” AI function that can create research papers that look like academic research papers: in depth, with citations and spanning various research tasks.

The Evolution of GenAI

When ChatGPT was first released, we were looking at the basic functionality of “Large Language Models” (LLMs). LLMs have been likened to very sophisticated next word predictors, taking the input from the user and large amounts of training materials to create probabilistically likely and coherent sounding responses. They were not research tools, they did not search the web, they did not do database retrieval of facts; they simply looked at historical patterns and created responses based on the likelihood of one term (or, more specifically, “tokens” – which are words or word fragments) appearing after another.

“Agentic” AI is AI given access to tools and some autonomy to perform tasks. It will consider the prompt and evaluate the steps necessary to fulfill what it is asked to do.

Over time, the primary solution providers in GenAI – in particular, OpenAI (ChatGPT), Microsoft (Copilot), Google (Gemini), Anthropic (Claude) and search specialist Perplexity – began to add functionality beyond the probabilistic completion of coherent sentences. “Search” – supplementing training, with its inherent cut-off dates – set Perplexity apart from the competition, while Microsoft and Google supplemented the LLM results with information from searching Bing or Google. At the time of this writing, Anthropic is rolling out search in some versions of Claude.

“Reasoning” emulates more closely to human thought the process of evaluating responses, and not just putting out a probabilistic result. Where prompting an LLM to “draft a sales letter to Sam Johnson” would result in a response with no further questions, a reasoning GenAI might ask questions, such as “Who is Sam Johnson? What are you trying to sell Sam? What else do I need to know?”.

“Agentic” AI is AI given access to tools and some autonomy to perform tasks. It will consider the prompt and evaluate the steps necessary to fulfill what it is asked to do. The tools may be the ability to interact with a web site, to write and execute its own code or enlist other AIs to achieve the goal it is given.

Another challenge of Deep Research is that it can only analyze what it can find and does not begin with a skeptical mind.

This leads us to “Deep Research.” Although it may go by different names for each GenAI solution provider, the concept is the same: the user provides information about research the user wishes to perform. The GenAI Deep Research tool evaluates the request, determines course of action and – sometimes after discussion with the user – then accesses research sources, finds what it determines to be potentially relevant citations, evaluates the content, and builds a research paper. The process will normally take at least a few minutes, compared with the almost instantaneous results of typical interactions.

The Area of “Deep Research”

Some of the major solution providers offering “Deep Research” can be found in Table 1. The space changes quickly, and there is no authority that has defined “Deep Research.”

Deep Research is not limited to academic subjects, although its use for academic papers has been controversial and disruptive. It has uses for market analysis, technical investigations; auditors needing to research companies and the industry they are in would do well to run a Deep Research report.

Table 1: Some Deep Research alternatives

Solution Provider	Deep Research Tool	Comments
Google Gemini	Gemini Deep Research	Available to all at no cost
Microsoft	Deep Research (not to be confused with “Think Deeper”)	Features just starting to roll out
OpenAI	Deep Research	Number of Deep Research queries limited by type of subscription
Perplexity	Deep Research	Freemium options

There are limitations to Deep Research. The nature of the in-depth results and ongoing issues with distinguishing reliable from unreliable sources, propagating misinformation (or at least opinionated but arguable) information and issues of cross-verification are just a few of the

challenges and limitations found.

For example, as the old saying goes, “History is written by the victors.” (Perplexity¹ notes that the saying traces back at least to 1842, noting, “‘*L’histoire est juste peut-être, mais qu’on ne l’oublie pas, elle a été écrite par les vainqueurs*’” (“History is right, perhaps, but let us not forget it was written by the victors”))

In doing Deep Research on the history of XBRL, I found a number of statements taken from *Wikipedia*, statements with which I disagree. Therein lies another challenge of Deep Research; it can only analyze what it can find and does not begin with a skeptical mind.

Some are concerned that there will be a proliferation of academic papers written in response to brief prompts from those seeking to be published.

Using Deep Research

Using Deep Research is not difficult to start, although – as with any prompt to GenAI – the more specific you can be, the more likely the results will be meaningful and useful to the user. With ChatGPT, you go to the primary interface and select “Deep research.” The same is true for Perplexity. To perform Deep Research from the Gemini main page, you select the Deep Research model from the model chooser at the top left of the page.

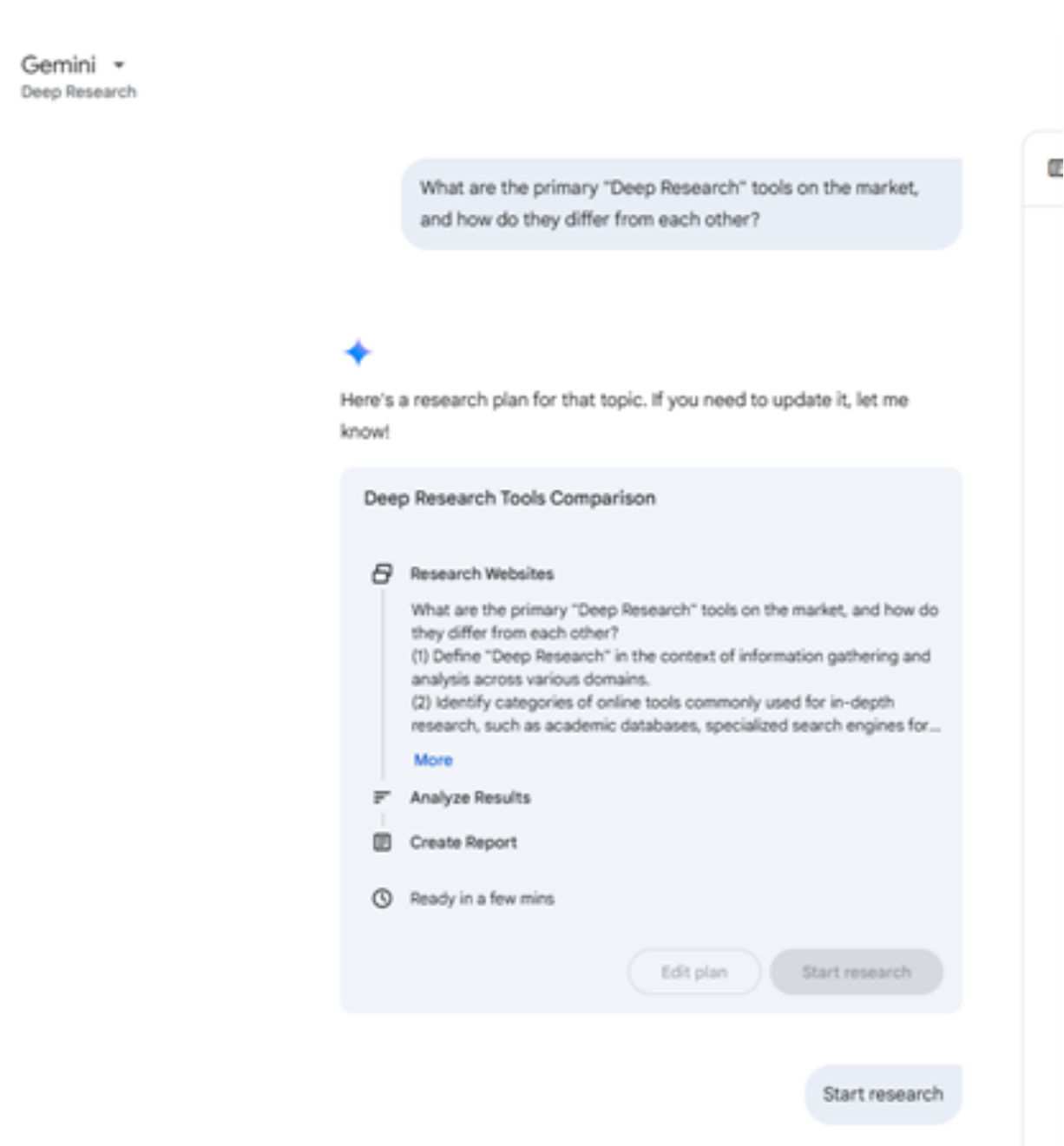
Once you have made that selection and entered your prompt, you will see the tool in some fashion share its “thinking” process.

For example, if you ask, “What are the primary “Deep Research” tools on the market, and how do they differ from each other?”, the tool may begin by evaluating the prompt, looking to define important terms and then searching for relevant articles.

The differences between using a more sophisticated reasoning model and a Deep Research model may be difficult to see. Using Gemini as the example, however, using 2.5 Pro, the high-end reasoning tool, and using Deep Research differ in the agentic aspects: developing a plan and seeking approval and then carrying out the work with Deep Research, but responding more quickly and with less interaction with 2.5. You can see the beginning of a Deep Research interaction in Table 2



Table 2: Gemini Deep Research *at Work (Part 1)*



Agentic AI powering Deep Research tools offer financial professionals a way to dramatically augment their capabilities – to research, to analyze, to keep up with information faster and process it more deeply.

Table 3: Gemini Deep Research at Work (Part 2)

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Deep Research Tools Comparison
Show thinking ▾
✕

Understanding Deep Research

I'm starting by trying to understand what exactly constitutes 'Deep Research' in the context of online tools. It seems to refer to a more thorough and in-depth investigation of a topic, going beyond surface-level information.

Initial Tool Categories

My initial thoughts are that tools for this kind of research might include specialized search engines that go beyond general web searches, academic databases containing scholarly articles, patent databases for technical information, and tools designed for analyzing large datasets.

Next Steps

I will now begin exploring these categories to identify specific tools within each and understand their unique features and how they can be used for deep research.

Researching websites

bytebridge.medium.com b...

pageon.ai How to Conduct...

atlasli.com Essential Tool...

bytebridge.medium.com D...

intrac.org BASIC TOOLS F...

datacamp.com OpenAI's ...

researcher.life Top 16 Digi...

instituteofaistudies.com W...

evalcommunity.com Rese...

contentgrip.com AI-powe...

fcit.usf.edu The Internet: ...

godofprompt.ai OpenAI R...

otio.ai 30 Essential Online ...

openai.com Introducing d...

seerinteractive.com Goog...

limotions.com The 5 Most ...

amplifysis.com What is D...

emmaclark.org Simple Lis...

continents.us Top Online ...

collegeraptor.com 22 FRE...

Defining Deep Research

I've found that 'Deep Research' involves a detailed and systematic investigation to gain comprehensive insights into complex problems. It's more than just a quick search; it requires analyzing data from various sources and identifying patterns to build a complete understanding. Artificial intelligence is playing an increasing role in this process by helping to process large amounts of information efficiently.

Categories of Research Tools

Based on my initial exploration, I've identified several categories of online tools that are relevant for in-depth research. These include academic databases like JSTOR and PubMed, specialized search engines such as Google Scholar, tools for analyzing large datasets, AI-powered research assistants like OpenAI's Deep Research, and tools for managing references and organizing research.

Further Exploration

To get a clearer picture of the market, I will now focus on academic databases and specialized search engines. I plan to search for more examples within these categories and gather more specific information about their features and functionalities.

Researching websites

luigisbox.com Top Special...

womentech.net Exploring ...

medium.com List of Top 1...

myjotbot.com The 10 Best...

semanticscholar.org Sem...

blalry.com Best Academic...

pmc.ncbi.nlm.nih.gov Whi...

coursera.org 10 Data Ana...

paperpile.com The best a...

libguides.princeton.edu P...

en.wikipedia.org List of a...

guides.lib.uchicago.edu D...

thoughtspot.com 6 Best B...

otio.ai 24 Best Research D...

thetoclub.com 35 Best BL...

paperpile.com The best a...

Deep Research vs Deep Research

Musical satirist Tom Lehrer, in his song about Russian mathematician Nikolaï Ivanovich Lobachevskiï, says that if you pirate the work of one author, it is plagiarism, but if you pirate the work of multiple authors, it is research – the secret of success in mathematics.² The use of Deep Research capabilities has become controversial in academic circles.³ Some are concerned that there will be a proliferation of academic papers written in response to brief prompts from those seeking to be published, and that reviewers will likewise using GenAI tools to review the

increasing number of papers, leading to lower-quality papers in general and more difficulty in running good papers through the editorial selection and review process.

What If You Put One Deep Research Tool Against Another?

In preparation for a recent session I provided for the technology committee of a United States' based state society of CPAs, I wanted to research the use of agentic AI (and, as a subset, Deep Research tools).

I decided to:

1. Post a research topic to OpenAI's Deep Research and Gemini Deep Research, to assess the initial results.
2. Provide the results from each Deep Research tool, and feed it to the other tool, asking if it supplemented the research provided.
3. Assess the results I preferred.

Step 1: Post a research topic.

Here is my initial prompt:

It is March 20, 2025. Over the last three months, agentic AI has become somewhat commonplace. ChatGPT offers Operator, although that is limited to the upper classers who pay \$200/month; it may be available to other users soon. Google has chosen to make Deep Research, an agentic application, available to all Gemini users. Gemini makes agentic AI available in AI Studio with its Gemma models, and will soon roll agents out in Gemini. Claude has Claude for Computer Use and Claude Coding. Microsoft 365 Copilot Chat is built on a model where they will be charging users for agents. Data Science Agents for Colab are another Google agentic offering, freely available for doing agentic projects around data analytics. Please do a deep research publication about Agentic AI: what it is, how it relates to Generative AI and Large Language Models, the current offerings, and the relevance to accountants, auditors, tax preparers and other financial professionals. For accountants there are some very important things, including confidentiality/privacy, reliability and repeatability (a challenge when most LLMs are probabilistic rather than deterministic), heavy numeric activity (again, not a strong position for LLMs), and explainability - an important thing for auditors is audit documentation, where someone else has to be able to understand and potentially reproduce the work of an auditor, and activity in an agentic black box will be a problem.

ChatGPT asked for clarification:

- *Depth and Format: Would you like a high-level summary, an in-depth technical analysis, or a structured report with sections and references?*
- *Target Audience: Should this be written for AI/tech professionals, financial professionals, or a general business audience?*
- *Specific Case Studies or Tools: Do you want real-world examples of agentic AI use in accounting and auditing, or a broader discussion of its impact?*
- *Preferred Length: Should this be a concise briefing (1-2 pages), a detailed report (5-10*

pages), or an extensive whitepaper?

- *Regulatory/Compliance Focus: Should I cover specific regulations (e.g., SOX, GAAP, IFRS, data privacy laws) in relation to AI adoption?*

Gemini simply presented its plan to research websites, analyze the results, and create a report. I nonetheless provided the clarification I gave to ChatGPT as additional input.

Step 2: Feed the resulting Deep Research deliverable to the other solution.

The initial results of both tools were impressive, although I found the ChatGPT response closer to my information needs. From a practical perspective, Gemini's ability to interact with Google Docs and Google Sheets (for the text and tabular information) was an important benefit.

I have shared links to the conversation with OpenAI,⁴ below.

Step 3: Assess my preferred solution.

Both results were once again impressive. I preferred OpenAI's results, but note that I pay for the Plus plan for a limited number of Deep Research projects monthly, whereas there is no cost for Gemini's Deep Research. Gemini also has the connection to the Google Suite, and Gemini can now create an audio overview, a "podcast" summarizing the results, as part of its basic functionality.

Relevance to the Financial Professional

Agentic AI powering Deep Research tools offer financial professionals a way to dramatically augment their capabilities – to research, to analyze, to keep up with information faster and process it more deeply. Deep Research solutions can synthesize more content, more effectively and discover hidden connections, keeping the financial professional more informed and equipped with more data-driven decisions in a complex and everchanging environment. Deep Research is just one part of the agentic environment; with the advanced analytical capabilities of these solutions, this represents a fundamental shift in how financial research and analysis can be conducted.

End Notes

¹ https://www.perplexity.ai/search/what-is-the-history-of-the-phr-hfwqS.PpTxCPCT_U7VI5Ug.

² [https://en.wikipedia.org/wiki/Lobachevsky_\(song\)](https://en.wikipedia.org/wiki/Lobachevsky_(song)).

³ <https://aaahq.org/Research/Journals/Issues-in-Accounting-Education/Guide-for-Authors#:~:text=This%20section%20is%20titled%20%E2%80%9CDeclaration,the%20scope%20of%20their%20output..>

⁴ <https://chatgpt.com/share/67ddb762-4950-800d-abdc-9f5ced7f17d7>.