Generative AI for Tax: Looking Back, Looking Ahead

by Benjamin Alarie

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In this article, Alarie highlights updates in generative artificial intelligence technology over the past year, particularly for tax analysis, and he predicts further developments in AI technology for 2024.

Benjamin Alarie

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As a tax law professor and artificial intelligence specialist at the University of Toronto, and as CEO of Blue J, I recognize that my professional commitments may suggest a conflict of interest in discussing generative AI for tax. Blue J's prominence in the field compounds that perception. I wish to assure readers that I've taken care to remain objective in my analysis. My goal is to contribute thoughtfully and critically to the important ongoing conversation about AI's role in tax law, while being open and transparent about my intersecting interests.

I. Introduction

In 2023 it suddenly seemed that everyone began talking about generative artificial intelligence.[1] For those who have been too occupied with the actual practice of tax to be closely following the developments in generative AI over the last year, this installment of Blue J Predicts is for you. It will go through the key points involving generative AI from 2023 that may be relevant to your life and tax practice — there are, indeed, a few. From there, the focus will be on what to expect in the year ahead.

As we enter 2024, the intensity of the chatter about generative AI is, if anything, increasing.[2] Law firms[3] and accounting firms[4] have been assessing generative AI and what it means for the future of professional services.[5] Some law firms have launched their own internal generative AI solutions.[6] Accounting firms have made bold announcements about generative AI, with at least one announcing a billion-dollar investment in generative AI over the next three years.[7] Publishers have been making announcements, too.[8] Universities have been concerned about the capabilities of current AI technologies and what the expected radical improvements in AI mean for

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[1] For a nice review, *see* Sam Sim, "Artificial Intelligence and Taxation at the Dawn of Generative AI," *Tax Notes Int'l*, Dec. 18, 2023, p. 1647.

[2] A search for mentions of "artificial intelligence" on taxnotes.com shows that 2023 was the year with the most mentions. As of the second week of January, 2024's rate of mentions is running ahead of 2023.

[3] Erin Mulvaney and Lauren Weber, "End of the Billable Hour? Law Firms Get On Board With Artificial Intelligence," *The Wall Street Journal*, May 11, 2023.

[4] Ray Meiring, "Generative AI: Optimizing Pursuits to Fuel Growth," *Accounting Today*, Aug. 31, 2023.

[5] Steve Lohr, "A.I. Is Coming for Lawyers, Again," *The New York Times*, Apr. 10, 2023.

[6] Gunderson Dettmer, "Gunderson Dettmer Launches ChatGD, a Homegrown Generative AI Chat App, to its Lawyers," News, Aug. 9, 2023.

[7] Nolan Ogden and Dom Megna, "Generative AI Presents Big Innovation Opportunities for Tax Departments," PwC Tax Research and Insights, June 5, 2023.

[8] Thomson Reuters, "A Year in Review: How AI Transformed the Legal Profession in 2023," Jan. 8, 2024.

the future of higher education.[9] The IRS has been touting its AI vision[10] and outlined its efforts in leveraging machine learning.[11] State departments of revenue have been exploring the use of generative AI.[12] Articles have been published about the use of generative AI in tax administration globally.[13] Countless recent academic and professional conferences and events have included discussions about tax and AI.[14] More broadly, much popular media has been preoccupied with quick takes concerning the possibilities of AI "automating away all the jobs" and further advances in AI risking "the loss of control of our civilization."[15]

AI is, then, the topic of the day. But one could be forgiven for ignoring what might be characterized as — from the perspective of a skeptical, busy, and quite possibly overworked tax professional — the hype, empty chatter, and hyperbole about AI. Indeed, many of us will have been far too busy with other things throughout 2023 — like doing heads-down tax work — to be following the speculative hand-wringing about runaway AI capabilities leading to the precipice of societal collapse or, more granularly, the seemingly never-ending technical generative AI developments. Many will not have been following these developments at all, as difficult as the distant din of excitement and concern around AI may have been to avoid entirely.

This article canvases the highlights of what has been going on with generative AI over this past year. It outlines the main developments ushered in by the large technology players for the development and commercialization of AI in 2023 and then, more importantly for the purposes of

tax professionals, offers a quick rundown of some of the principal developments in the world of tax law specifically for generative AI in 2023, particularly regarding tax analysis. It then forecasts what lies ahead for generative AI in tax in 2024.[16] This exercise is inevitably somewhat fraught since AI technology is moving quickly, but my view is that it is better to hazard a fuzzy speculative view of what lies ahead than to be too timid to posit any view at all. To this end, the discussion outlines what we can expect in terms of developments from the tech giants and from the providers of tools that are most relevant to tax professionals.

Without further ado, let's begin with recapping 2023.

II. Looking Back on 2023

A year ago, at the beginning of 2023, ChatGPT was just beginning to emerge into the public consciousness. There were high-profile cautioning comments by thoughtful people triggered by what they perceived as excessive giddiness and enthusiasm about generative pretrained transformers (GPTs).[17] Academic and professional commentators seeking to raise awareness of the limitations of GPTs resorted to polite name-calling, with some labeling large language models (LLMs) as "stochastic parrots."[18]

According to Emily M. Bender, one of the academic coauthors of the paper that coined the term, a stochastic parrot is an algorithmic process that "haphazardly stitches together sequences of linguistic forms . . . according to probabilistic

[9]ACUE, "Preparing for the Future: The Impact of AI on Higher Education," Featured News, Apr. 26, 2023.

[10]Nathan J. Richman, "Artificial Intelligence to Help With IRS Audit Selection," *Tax Notes Federal*, Nov. 13, 2023, p. 1301.

[11]Lauren Loricchio, "IRS Working to Deploy AI Algorithms and Models," *Tax Notes Federal*, July 24, 2023, p. 613.

[12]Emily Hollingsworth, "AI in the DOR: State Tax Departments Ponder Use of Artificial Intelligence," *Tax Notes State*, Aug. 14, 2023, p. 549.

[13]Jeffrey Owens et al., "Generative AI: The Power Behind Large Language Models and Their Use in Tax Administration," *Tax Notes Int'l*, Nov. 27, 2023, p. 1255.

[14]Virtually every professional tax conference in 2023 directly or indirectly addressed AI and the future of tax.

[15]"How to Worry Wisely About Artificial Intelligence," *The Economist*, Apr. 20, 2023.

[16]I have previously written about where I believe this all goes in the longer term — toward legal singularity. *See, e.g.*, Abdi Aidid and Benjamin Alarie, *The Legal Singularity: How Artificial Intelligence Can Make Law Radically Better* (2023); and Alarie, Rory McCreight, and Cristina Tucciarone, "The Path of Tax Law: Toward Legal Singularity," *Tax Notes Federal*, Aug. 28, 2023, p. 1455.

[17]Ezra Klein, "A Skeptical Take on the A.I. Revolution. The A.I. Expert Gary Marcus Asks: What if ChatGPT Isn't as Intelligent as It Seems?" The Ezra Klein Show Podcast (Jan. 6, 2023).

[18]Emily M. Bender et al., "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?" Proceedings of the 2021 Association for Computing Machinery Conference on Fairness, Accountability, and Transparency (Mar. 2021).

information about how they combine, but without any reference to meaning."[19] Part of the objection raised by commentators using the term is that reducing language to a quasi-random statistical process, as LLMs arguably do, means that they could perhaps, at best, be regarded as mostly harmless curiosities, algorithms that produce strings of words (or more formally, "tokens") that can pass themselves off as carrying out the real work of reasoning, without actually "reasoning" in the same way that humans do. This view has been echoed by high-profile academics, including linguist Noam Chomsky, who claim that while these systems can produce "seemingly humanlike language and thought . . . we know from the science of linguistics and the philosophy of knowledge that they differ profoundly from how humans reason and use language."[20]

Indeed, at their worst, according to the sharpest critics of recent advances in AI, LLMs are prone to many deficiencies that could be quite dangerous in practice, such as bias, opacity, and hallucinations. The worry is that if these models are used uncritically, they could cause real societal harm. From this perspective, LLMs are (or at least could be) so seriously inadequate that they should not, and perhaps cannot, be trusted to assist with real professional work. Related views have been shared by tax lawyers.[21] Within tax law, the stochastic parrot critique of LLMs highlights a potentially critical concern: AI could generate convincing-looking tax advice that will not stand up to legal scrutiny or reflect recent legislative changes. Naturally, until these systems are radically improved, tax professionals are essential in evaluating LLM outputs for legal validity to

mitigate against the possibility of the adoption of erroneous advice.

At about the same time in the first half of 2023, some of the most prominent scientific developers of AI began to publicly sound warnings about the challenges of ensuring AI safety, against the backdrop of prospects of runaway progress with AI.[22] For example, Geoffrey Hinton, often described as the "godfather of AI," made appearances in popular media expressing serious reservations about what he now regards as the emergence of true reasoning from the newest AI systems. Indeed, early in 2023 Hinton resigned from Google at least in part to avoid feeling that he should be self-censoring his views about AI.[23] In media appearances, Hinton warned that the speed and capabilities of powerful new AI on the horizon may portend existential risk for the future of humanity, including his concern that "AI may figure out how to kill people."[24]

It is difficult, of course, to give credence simultaneously to both points of view — that AI is both a stochastic parrot that is capable of mimicking reasoning but incapable of it and yet, at the same time, express sincere concern that AI poses an existential threat to humanity and may become much more intelligent than us and thus poses serious existential risks to humanity. Of course, the difference could simply be put down to a difference in time horizon, with the stochastic parrot types downplaying the effectiveness of the current state of generative AI technology, highlighting its significant limitations, with the AI doomsayers focusing instead on the medium to longer term of the technology in the years and decades ahead. After all, if exponential improvements to AI systems are sustained, it will not be long before these systems resoundingly overcome their current limitations. Then, of course, there are the AI boosters, who are

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[19] Elizabeth Weil, "You Are Not a Parrot," *New York Magazine*, Mar. 1, 2023. The use of the term "stochastic parrot" was intended to be pejorative. Sam Altman, CEO of OpenAI, flipped the script on this use of the term on X (formerly known as Twitter) posting, "I am a stochastic parrot and so r u." *See* Sam Altman, X post, Dec. 4, 2022. The suggestion, of course, was that the human use of language is deeply like the generation of language by LLMs; humans are not special.

[20] *See* Noam Chomsky, Ian Roberts, and Jeffrey Watumull, "Noam Chomsky: The False Promise of ChatGPT," *The New York Times*, Mar. 8, 2023.

[21] *See, e.g.*, Loricchio, "AI Programs Not Reliable Enough Yet for Tax Work, Attorney Says," *Tax Notes Federal*, June 26, 2023, p. 2241; *see also* Libin Zhang, "Four Tax Questions for ChatGPT and Other Language Models," *Tax Notes Federal*, May 8, 2023, p. 969.

[22] For example, the Future of Life Institute called for a pause on research on GPT models more powerful than GPT-4, attracting more than 30,000 signatures to an open letter to that effect. *See* "Pause Giant AI Experiments: An Open Letter," *Future of Life*, Mar. 22, 2023.

[23] Josh Taylor and Alex Hearn, "'Godfather of AI' Geoffrey Hinton Quits Google and Warns Over Dangers of Misinformation," *The Guardian*, May 2, 2023.

[24] *See, e.g.*, "'Godfather of AI' Discusses Dangers the Developing Technologies Pose to Society," PBS Newshour YouTube, May 5, 2023; and "'Godfather of AI' Warns That AI May Figure Out How to Kill People," *CNN*, May 2, 2023.

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cautiously (and some enthusiastically)[25] optimistic about the future of AI in the years and decades ahead.[26]

My view, based on my academic research on the legal singularity,[27] as well as the applied research and development on AI and tax happening at the start-up I lead, Blue J,[28] is that there are genuine reasons to be optimistic about the value of generative AI for tax professionals. Of course, nevertheless, we should all be concerned about attending to the ethics of generative AI in tax practice.[29] On this front, I derive comfort from the efforts that are underway to ensure AI safety and ethics in tax law. Tax administrations globally are adopting AI to provide better taxpayer services and compliance. For instance, the OECD's 2023 tax administration report highlights the widespread use of AI virtual assistants by tax authorities to enhance service quality.[30] More broadly, the United States[31] and the United Kingdom[32] are undertaking initiatives to ensure the safety of AI; these are commendable and prudent.

Let's now turn to our rundown of the big generative AI developments in 2023 generally and then drill down into what generative AI began to make possible for tax professionals this past year.

A. 2023 Commercial Developments

Framed by the explosion onto the scene of OpenAI's ChatGPT at the end of 2022, throughout 2023 we observed robust competition and collaboration among AI start-ups and tech giants, each striving to advance the state-of-the-art in widely available capabilities. Important parts of these efforts were those explicitly targeted at making more efficacious chatbots available and, in the case of the tech giants, efforts geared to integrating generative AI into their broader ecosystems of offerings. Here are some of the highlights from 2023 developments among the top start-ups and tech firms in the generative AI space.

1. OpenAI.

After launching ChatGPT in late 2022, OpenAI followed up with its launch of GPT-4 in March 2023. Throughout 2023, OpenAI continued to be closely allied with Microsoft; early in the year, Microsoft pledged to invest an additional $10 billion in OpenAI, on top of earlier investments of $3 billion. At OpenAI's DevDay event in November 2023, GPT-4 Turbo was introduced. GPT-4 Turbo is a more advanced AI model with expanded capabilities, including a token context window that supports up to 128,000 tokens (each token represents about three-fourths of a word), allowing it to handle over 300 pages of text in a single prompt. This is a 32-fold improvement over the capabilities that ChatGPT had at its launch in late 2022 when the available context window was just 4,000 tokens. OpenAI also announced custom GPTs at its November DevDay event, enabling users to create their own AI models through simple instructions without the need for coding, and the "GPT Store," an online marketplace in which creators can market their AI applications.[33] The GPT Store launched on January 10 and already boasts more than 3 million custom GPT applications.[34] Hundreds of these new GPT applications already address tax and legal use cases.[35]

2. Anthropic.

In 2023 AI start-up Anthropic introduced new flagship models, with Claude in March 2023 and

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[25] *E.g.,* venture capitalist Marc Andreessen has argued that "AI will save the world." *See* Marc Andreessen, "Why AI Will Save the World," June 6, 2023.

[26] *See, e.g.,* Ralph Losey, "Ray Kurzweil: Google's Prophet of Superintelligent AI Who Will Not Slow Down," *JD Supra*, Dec. 11, 2023. There are other technologists who play up the positive aspects of AI for solving important challenges. *See, e.g.,* Art Raymond, "Bill Gates 'Optimistic' About Role AI Could Play in Solving Global Challenges in Education, Health and More," *Desert News*, Dec. 19, 2022.

[27] The term "legal singularity" refers to a hypothetical future in which AI systems are expected to process legal knowledge more effectively than humans, potentially automating swathes of the legal decision-making process and leading to universal legal literacy in real-time and on-demand. *See* Aidid and Alarie, *The Legal Singularity*, *supra* note 16.

[28] Especially with *Ask Blue J*, see discussion below.

[29] *See* Alarie and McCreight, "The Ethics of Generative AI in Tax Practice," *Tax Notes Federal*, July 31, 2023, p. 785.

[30] *See* OECD, "Tax Administration 2023" (Sept. 27, 2023).

[31] White House Fact Sheet, "President Biden Issues Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence" (Oct. 30, 2023).

[32] Marinao-Florentino (Tino) Cuellar, "The UK AI Safety Summit Opened a New Chapter in AI Diplomacy," Carnegie Endowment for International Peace, Nov. 9, 2023.

[33] *See* "New Models and Developer Products Announced at DevDay," OpenAI Blog, Nov. 6, 2023.

[34] Stephen Shankland, "OpenAI's GPT Store Now Offers a Selection of 3 Million Custom AI Bots," *CNET*, Jan. 10, 2024.

[35] "Introducing the GPT Store," OpenAI Blog, Jan. 10, 2024.

Claude 2 in July 2023.[36] Claude 2 boasts a 100,000 token length, which was the greatest generally available before the 132,000 token length offered by GPT-4 Turbo. As a company, Anthropic is allied with Google and Amazon. Google announced investments of $2 billion in Anthropic in 2023, and Anthropic is planning to use some of Google's technology to power its models.[37] Amazon was not to be outdone by Google in collaborating with Anthropic. In September 2023 Anthropic announced that it had attracted a $4 billion investment from Amazon, coupled with a strategic partnership to use Amazon Web Services (AWS) infrastructure to scale and deploy AI models.[38]

3. Microsoft.

In 2023 Microsoft leveraged its close relationship with OpenAI to advance its ambition to lead in AI among the tech giants. To this end, Microsoft focused on integrating AI into various services and tools, including tying GPT-3.5 and GPT-4 into its Bing search engine, seeking to make generative AI technologies more accessible and efficient for everyday tasks. In September 2023 Microsoft Copilot was announced as an AI companion that understands context and assists in document creation, data analysis, and programming tasks and can work throughout the Windows operating system, Bing search, and Microsoft Office applications, building on the foundations laid by OpenAI's GPT-3.5 and GPT-4.[39]

4. Meta.

In July 2023 Meta announced that it would be open sourcing its Llama 2 model.[40] Meta has made Llama 2 free for research and commercial use.[41] Microsoft teamed up with Meta as its preferred partner for Llama 2. While it was trained on an extensive dataset of approximately 2 trillion

tokens,[42] Llama 2 is not as powerful as the leading commercially available LLMs, such as GPT-4 Turbo; Llama 2 has a context length of 4,000, compared with 128,000 for GPT-4 Turbo. Llama 2, nevertheless, does perform well on many evaluation benchmarks.[43] Moreover, there is a growing open-source community working diligently to improve the function and performance of Llama 2 and other open-source models.[44]

5. Google.

Google announced a "code red" at the end of 2022 over the runaway success of OpenAI's ChatGPT.[45] Google then raced to launch Bard, its answer to ChatGPT.[46] Google's Bard was introduced in March 2023 and, striving to blend AI with search, sought to provide a more intuitive and conversational interface. In December 2023 Google unveiled Gemini, which is its latest and most advanced AI model. Gemini is multimodal, capable of processing and understanding various types of information including text, code, audio, image, and video. In 2024 Google is reportedly planning to integrate Gemini into several of its products, enhancing services like Bard, and it will also be available for developers through an application profiling interface.[47]

6. Amazon.

In 2023 Amazon made several strategic moves to advance its position in the generative AI space. It introduced Amazon Q, a new generative AI assistant specifically designed for work environments. Amazon also announced a strategic collaboration with Anthropic to advance the development of generative AI. The partnership seeks to leverage AWS's infrastructure, for building and deploying future foundation models, and be made accessible to

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[36] "Claude 2," Anthropic, July 11, 2023.

[37] Julia Love and Matt Day, "AI Startup Anthropic to Use Google Chips in Expanded Partnership," *BNN Bloomberg*, Nov. 8, 2023.

[38] "Amazon and Anthropic Announce Strategic Collaboration to Advance Generative AI," Amazon, Sept. 25, 2023.

[39] Yusuf Mehdi, "Announcing Microsoft Copilot," Microsoft Blog, Sept. 21, 2023.

[40] "Meta and Microsoft Introduce the Next Generation of Llama," Meta News, July 18, 2023.

[41] *Id.*

[42] "Introducing Llama 2," Meta, Jan. 13, 2024.

[43] Diana Cheung, "Meta Llama 2 vs. OpenAI GPT-4," Medium, Dec. 5, 2023.

[44] *See, e.g.*, Steve Lohr, "An Industry Insider Drives an Open Alternative to Big Tech's A.I.," *The New York Times*, Oct. 19, 2023.

[45] Aaron Mok, "Google's Management Has Reportedly Issued a 'Code Red' Amid the Rising Popularity of the ChatGPT AI," *Business Insider*, Dec. 21, 2022.

[46] Nico Grant and Cade Metz, "Google Releases Bard, Its Competitor in the Race to Create A.I. Chatbots," *The New York Times*, Mar. 21, 2023.

[47] Jennifer Elias, "Google Launches Its Largest and 'Most Capable' AI Model, Gemini," *CNBC*, Dec. 6, 2023.

AWS customers through Amazon Bedrock. As noted, the Amazon-Anthropic collaboration includes a significant investment from Amazon into Anthropic, suggesting a long-term commitment to integrating these AI advancements across Amazon's services.

Let's turn now to an overview of how AI has been applied to tax law and analysis by start-ups and tax and legal publishers in 2023.

B. Tax Law and Generative AI in 2023

In 2023 publishers and start-ups began focusing on incorporating generative AI to enhance their tax and legal research capabilities. Various companies began to produce tools to allow tax professionals to leverage generative AI to analyze primary and secondary tax content. As new capabilities came online throughout 2023, it became increasingly clear that the new application of generative AI in the tax research process will be making tax research faster and more effective for tax experts.

At the start of 2023,[48] I reflected on the advancements in AI and tax in 2022, particularly the improvements that had recently been made to OpenAI's GPT-3.[49] I also discussed the emergence of ChatGPT at the end of 2022 and the likely prospects for the impact of GPTs and LLMs on tax law and research. Among other things, I discussed the predictive capabilities of AI in relation to tax case outcomes and noted that the predictions concerning pending cases in this Blue J Predicts column throughout 2022 had at that point a perfect record.

Perhaps emboldened by the success of Blue J's predictive performance in 2022, I made the following predictions for the upcoming year of 2023:

> The use of NLP [natural language processing] and large language models will increasingly enable research platforms to quickly scan and extract key concepts from various sources, helping practitioners better understand their implications — both their potential pitfalls

as well as opportunities for improved planning outcomes. . . . The near term of tax research and analysis will continue to witness the use of AI-driven technologies to enable significant improvements.[50]

While not inaccurate, in retrospect, I significantly underestimated the implications of the dramatic improvement in LLMs in 2023. Most importantly, I did not foresee how capable GPT-4 was going to be. I was not alone. When GPT-4 was announced in March 2023 by OpenAI, it was significantly more capable than most commentators expected it to be (despite arguably getting some of its tax analysis wrong[51] in Greg Brockman's "GPT-4 Developer Livestream" demo on March 14, 2023).[52] To foreshadow where this discussion is leading, learning from my underestimation of AI's advancement last year, I predict that AI progress is going to be surprisingly strong in 2024, putting the lie to suggestions by some, including Bill Gates, that LLM progress may be plateauing.[53]

In any event, the unveiling of GPT-4 in March 2023 was a watershed moment. Several weeks later, I explored with my Blue J coauthors the potential and limitations of using LLM-based AIs, specifically ChatGPT, in answering complex tax law questions.[54] In this article, we conducted an experiment comparing the responses of ChatGPT versions (GPT-3.5 and GPT-4) and Blue J's newly developed *Ask Blue J* platform to a series of tax law research questions. Our findings at the time highlighted the importance of using these LLM-based AI tools with caution in tax research, noting their promising potential to provide accurate, contextually relevant responses, while also emphasizing their limitations, including the risk of presenting inaccurate or fabricated information through "hallucinations."[55] We highlighted the need for continuous development and refinement

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[48] Alarie, "The Rise of the Robotic Tax Analyst," *Tax Notes Federal*, Jan. 2, 2023, p. 57.

[49] *Id*. at 58.

[50] *Id*. at 61.

[51] *See* Blue J, "GPT-4 Needs Tax Help: Better Call the Experts" (2023).

[52] Greg Brockman, "GPT-4 Developer Livestream," OpenAI YouTube, Mar. 14, 2023, beginning at 19:35.

[53] Bijin Jose, "Bill Gates Feels Generative AI Has Plateaued, Says GPT-5 Will Not Be Any Better," *The Indian Express*, Dec. 3, 2023.

[54] Alarie et al., "The Rise of Generative AI in Tax Research," *Tax Notes Federal*, May 29, 2023, p. 1509.

[55] *Id*. at 1511.

of these AI tools to enhance their reliability and utility in tax research.[56] This is precisely what we focused on at Blue J through the balance of 2023, leading to exciting improvements in accuracy and reliability in Ask Blue J's performance.

But Blue J was not alone. The leading tax publishers also were busy in 2023 working to explore how generative AI could contribute to tax research. Here is a rundown of announcements by AI tax start-ups and tax publishers concerning generative AI in 2023.

1. Blue J.

In August 2023 Blue J formally announced Ask Blue J, a generative AI tax research platform that draws on a large database of U.S. federal income tax materials to allow users to generate novel tax analyses of tax research questions.[57] The U.S. federal income tax data used by Ask Blue J is licensed from Tax Analysts.[58] Like ChatGPT, users can carry on a conversation with Ask Blue J to ask follow-up questions to narrow the analysis, explore different dimensions of the issues at play, or convert an answer into a deliverable work product, such as a memo or client email. In addition to the version of Ask Blue J that answers U.S. federal income tax questions, in December 2023 a new version was released for Canada, and one is in the works for the United Kingdom in 2024.[59] Ask Blue J is an enterprise-grade tax research solution that is offered commercially at price points that make it attractive to professional services firms and corporate tax groups of all sizes.[60]

2. Tax Analysts.

On January 18 Blue J and Tax Analysts announced a new strategic agreement under which Ask Blue J will incorporate materials from *Tax Notes Federal*, *Tax Notes State,* and *Tax Notes International* into Ask Blue J's products in the United States, Canada, the United Kingdom, and

— eventually — globally.[61] Tax Analysts' strategic agreement with Blue J will bring generative AI to the analysis of hundreds of thousands of pages of Tax Analysts' leading tax news and commentary through the Ask Blue J platform. Now in development, it is expected that the Ask Blue J platform will be widely available with *Tax Notes* news and commentary as source materials for answers generated by Ask Blue J beginning in February.[62]

3. LexisNexis.

In October 2023 LexisNexis announced Lexis+ AI.[63] While not directly focused on tax — its scope is much larger and applies to many areas of law — Lexis+ AI is a generative AI solution that delivers legal citations linked in its responses to user queries. It is designed to minimize the risk of hallucinations and ensures citation validation with Shepard's Citations functionality.[64] According to LexisNexis, the solution features conversational search, intelligent legal drafting, summarization, and document upload capabilities, seeking to significantly increase productivity in legal research and drafting.[65] Initially launched with scope limited to the United States, Lexis+ AI is now available in Canada and the United Kingdom.[66]

4. Thomson Reuters.

In May 2023 Thomson Reuters announced new AI and automation capabilities for Checkpoint Edge.[67] Now available in beta to some customers, according to Thomson Reuters, Checkpoint Edge AI Assistant uses generative AI to produce responses based on Checkpoint content, with credible citations supporting each answer. The system is designed to help users save

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[56]*Id.* at 1522.

[57]Blue J Legal release announcing Ask Blue J (Aug. 23, 2023).

[58]The materials include all aspects of primary federal income tax law, including the IRC, the regulations, and case law, as well as administrative materials of various kinds.

[59]The new Ask Blue J product for Canada was showcased by Blue J at the Canadian Tax Foundation's Annual Conference in Montreal in November 2023.

[60]Ask Blue J, "Generative AI for Tax Research" (2023).

[61]Blue J release announcing Blue J and Tax Analysts strategic agreement (Jan. 18, 2024) ("With the integration of Tax Analysts' independent tax news and commentary into Ask Blue J's platform, tax experts can expect unrivaled access to primary sources and related materials for tax-related content.").

[62]*Id.*

[63]LexisNexis release announcing the launch of Lexis+ AI (Oct. 25, 2023).

[64]*Id.*

[65]*Id.*

[66]LexisNexis release announcing the launch of Lexis+ AI in Canada and the United Kingdom (Jan. 11, 2024).

[67]Thomson Reuters release announcing content-driven AI technology (May 23, 2023).

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time in tax research and have confidence in the content provided by the AI assistant. In November 2023 Thomson Reuters announced that Checkpoint Edge AI Assistant would be available in beta in the United States that month, with general availability in 2024.[68]

5. Bloomberg.

In October 2023 Bloomberg Tax & Accounting launched its AI Lab to enhance what it refers to as "the Bloomberg Tax Research experience."[69] This initiative has started with what Bloomberg describes as an enhanced search feature that employs AI to produce a summary response to a user question, which then links directly to the most relevant Bloomberg Tax Research content. The stated goal of the Bloomberg Tax Research AI Lab is to streamline the research process for tax professionals.[70] The AI Lab expects to add new features and capabilities in the coming months.[71]

6. Wolters Kluwer.

Although at the time of writing the 12-page PDF promotional brochure for CCH Axcess on the Wolters Kluwer website does not explicitly mention "AI" or "artificial intelligence,"[72] Wolters Kluwer Tax & Accounting held an AI technology showcase at their annual CCH Connections: User Conference in October 2023.[73] The conference session demonstrated to attendees how AI-powered tools are enabling tax, accounting, and audit professionals to enhance their services.[74] Wolters Kluwer reportedly discussed the current state of AI within the profession, highlighting solutions such as CCH Axcess, and provided hands-on breakout groups for users to explore the possibilities of using generative AI.[75]

The advancements in generative AI that defined 2023, particularly with tools like GPT-4,

set the stage for 2024's innovations in tax law research. The coming year is expected to bring new models and further enhancements in AI tax tools, promising even more precise and efficient tax analysis. The integration of expansive legal databases with powerful LLMs will give tax professionals unprecedented research capabilities, while continuous improvements in the foundational AI algorithms and further developments in data curation and data quality will refine these tools further. Thus, as we transition into 2024, the tax profession stands on the brink of a new horizon in AI-assisted research and analysis.

III. Looking Ahead to 2024

There is no question that 2023 was a watershed year for generative AI. OpenAI led the way with ChatGPT and GPT-4 with its close ally, Microsoft. Strong competitors are working furiously to catch up. Anthropic is chasing, with support from Amazon and Google. Google is pushing hard to overtake OpenAI with its efforts in developing and launching Gemini. Other tech giants, such as Meta and Apple, are not as centrally in the race in a way that is directly relevant to tax professionals, but each is pursuing AI initiatives. Meta, for example, has been a leader in supporting open-source efforts in generative AI, most prominently with the release of Llama 2[76] and its recent announcement of Llama 3.[77] For its part, Apple is working to improve Siri by using generative AI technology[78] and to bring the Apple Vision Pro to market, which leverages AI in support of its augmented and virtual reality capabilities.[79]

Given how I underestimated AI progress a year ago, I will be bolder with my predictions regarding LLM capabilities in 2024. The trajectory of generative AI in tax law is poised for notable advancements in 2024. Building on the exciting

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[68]Thomson Reuters release announcing new AI and automation tax product capabilities (Nov. 9, 2023).

[69]Bloomberg Tax release announcing AI Lab (Oct 16, 2023).

[70]*Id.*

[71]*Id.*

[72]Wolters Kluwer, "Go Beyond Compliance With CCH Axcess," Tax & Accounting Brochure (Mar. 2023).

[73]Wolters Kluwer release announcing AI technology showcase (Oct. 20, 2023).

[74]*Id.*

[75]*Id.*

[76]*See* the discussion in Section II.

[77]Alex Heath, "Mark Zuckerberg's New Goal Is Creating Artificial General Intelligence," The Verge, Jan. 18, 2024. Mark Zuckerberg is quoted as saying, "With Llama 3 and beyond, our ambition is to build things that are at the state of the art and eventually the leading models in the industry."

[78]*See* Mark Gurman, "Inside Apple's Big Plan to Bring Generative AI to All Its Devices," Bloomberg, Oct. 22, 2023.

[79]*Id.*

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progress canvased above in 2023, we can anticipate significant improvement in the foundational models from OpenAI, Anthropic, and others in 2024. Despite this tail wind, AI's integration into the practice of tax law in 2024 will confront several challenges. Key issues include ensuring data privacy, the necessity of training tax professionals in AI applications, and aligning AI technology with existing approaches to tax practice. Also, the rapid pace of AI development might quickly surpass our predictions, demanding ongoing adaptation. Another significant concern is the potential for governments to fall behind in this technological evolution, which could lead to a disparity between private innovation and public sector capacity in tax law.

With these caveats registered, here are my three most important predictions about what we will see in 2024 in generative AI that will have the most impact on tax professionals.

Prediction 1: Foundational models will radically improve.

The year 2024 is set to witness significant strides in the capabilities of foundational models, with substantial improvements expected in several key areas of generative AI. OpenAI will likely release GPT-5 in 2024, Google will release enhanced versions of Gemini, Anthropic will release improved versions of Claude, and that open-source model will continue rapid development.

- *Reasoning capabilities.* Substantial improvements will be seen in reasoning ability, context windows, and multimodality capabilities. The most critical advancement will be the substantial improvement in the reasoning abilities of foundational models — the stochastic parrot critique of LLMs will be increasingly out of touch with the capabilities of the models. Much as it is now widely accepted that AI systems can outperform human chess and Go players, we will see new capabilities from OpenAI's GPT-5 as well as in models from others that exhibit unambiguously "better than human" performance in many areas of reasoning.
- *Context window expansion.* Context windows in 2024 will also be significantly expanded, allowing foundational models to exhibit much richer knowledge and awareness of interaction history. Context windows could reach a million tokens (or more) in 2024. That enhancement would enable AI models to process and retain information over longer conversations or documents, effectively allowing for more complex and nuanced interactions. This context window expansion will strongly complement the increases in reasoning capabilities and will set the stage for powerful new tax analysis capabilities (more on this below).
- *Multimodal capabilities.* In addition to the expanded context window, multimodal capabilities of AI are expected to undergo transformative developments. In 2023 we saw generative AI making huge strides in understanding and generating text and basic image content. The horizon for 2024 suggests that these models will begin to integrate and interpret video content, enabling users to interact with the AI in a truly multimodal fashion, including the possibility of real-time video analysis and generation. GPT-5 is likely to be multimodal with speech, text, image, and video capabilities. Google's Gemini model, which has been rigorously trained on an immense corpus of YouTube video content is set to redefine the benchmarks for multimodal AI performance in 2024. The implications for industries relying on visual data — such as media, education, and surveillance — in 2025 and beyond will be profound.

Prediction 2: Assistants like Microsoft's Copilot will go mainstream.

The ascent of Microsoft's Copilot and other generative AI tools into mainstream office productivity products such as email, word processing, spreadsheets, videoconferencing, and beyond is poised to alter much of the day-to-day work of tax professionals in 2024. As tools like Copilot integrate deeper into suites of productivity tools, their effect will be broad and multifaceted. For tax practitioners, the implications will be substantial. Copilot's integration into spreadsheets could automate the arduous task of data reconciliation and financial modeling, while its application in word

processors will streamline the drafting of tax opinions and memos by suggesting language, formats, and even content. As Copilot and similar tools move into the professional services mainstream, they will enhance efficiency and enable tax professionals to deliver more value to their clients through insights driven by AI-augmented analysis.

Prediction 3: Tax research will rapidly be dominated by generative AI.

In 2024 the reasoning advancements in models like GPT-5, combined with broader context windows, multimodality, greater tax content curation, and tax data availability, are set to significantly affect tax law and practice. Tax professionals can expect AI to enhance the accuracy of tax predictions and compliance checks, while also providing a deeper analysis of tax implications across various scenarios. Expansions in content availability through platforms like Ask Blue J, with access to millions of pages of expert tax analysis and commentary from the archives of *Tax Notes* will serve as a landmark enhancement. Combined with the latest foundational models such as GPT-5, this content will unlock unprecedented capabilities that will revolutionize tax research, offering a depth and breadth of tax analysis that was previously available only with the expenditure of extraordinary resources. We will also begin to witness advanced algorithmic reviews of tax advice, facilitating nuanced and sophisticated analysis of complex tax scenarios by tax administrations and clients alike. Indeed, clients will become substantially more sophisticated. They will increasingly be able to help themselves by accessing game-changing tax analysis capabilities through generative AI tax research platforms. Thus, these new generative AI tax analysis tools will lead to external tax experts increasingly playing explicitly strategic roles, leveraging generative AI systems in support of proactive sophisticated transactional tax planning and risk management.

It perhaps bears mentioning that all of this has implications for the training and education of new tax professionals. In my own experience as a tax law educator, I have begun integrating generative AI technologies into the classroom, including ChatGPT and Ask Blue J, providing a practical framework for students to engage with these tools. This approach is crucial in preparing them for a tech-centric legal environment. Increasingly tax education is not just about understanding tax; it is about equipping future tax professionals with the skills to leverage AI in tax analysis and decision-making.[80]

IV. Conclusion

The year 2023 was a landmark for generative AI in tax. As we move into 2024, change will continue at a rapid pace. The advancements we witnessed in 2023, particularly with technologies like GPT-4, have set the stage for what we can expect to be a transformative year ahead, with the emergence of GPT-5 and other sophisticated models, such as Gemini and Claude, in the offing. The conversation about AI in tax is evolving from a futuristic concept to an everyday reality. In 2024 we anticipate seeing these technologies become more refined and integrated into our daily tasks. This doesn't mean that our jobs are at risk; rather, it suggests that our roles will evolve to harness the power of AI for the more routine aspects of tax work, freeing us up for the complex, strategic thinking that adds the most value for our clients.

Generative AI is now establishing itself as a necessary tool in the tax professional's kit, with clear potential to make tax research more efficient and effective. However, it will not become a replacement for the nuanced understanding and judgment that experienced professionals bring to their work. As we embrace these new tools, we must remain focused on the value they add, while also being mindful of the importance of keeping our work human-centered and ethically grounded.

As we look ahead, the conversation about the integration of generative AI in tax law is not just about technology; it is about how we choose to adapt to changing possibilities and improving capabilities as professionals. Our challenge will be to use these tools responsibly and to continue to provide the insight and expertise that our clients rely on. The future of tax work is here, and it is up to us to shape and mold it. ∎

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[80] If you are a tax academic and have an interest in leveraging Ask Blue J for your own tax teaching, please contact me and we can arrange for you to have access.