

AI and the Future of the Profession: The Emergence of ChatGPT and Seeing the Potential

By *Eric E. Cohen, CPA*



Eric E. Cohen, CPA, is a technologist with a passion for collaboration toward the goal that “a piece of business information, once entered into any system, anywhere, never needs to be retyped as it moved through the business reporting supply chain.” He’s also a prolific author, engaged in virtually every effort to standardize accounting and audit data, a national expert to a wide variety of standards efforts, and co-founder of XBRL.

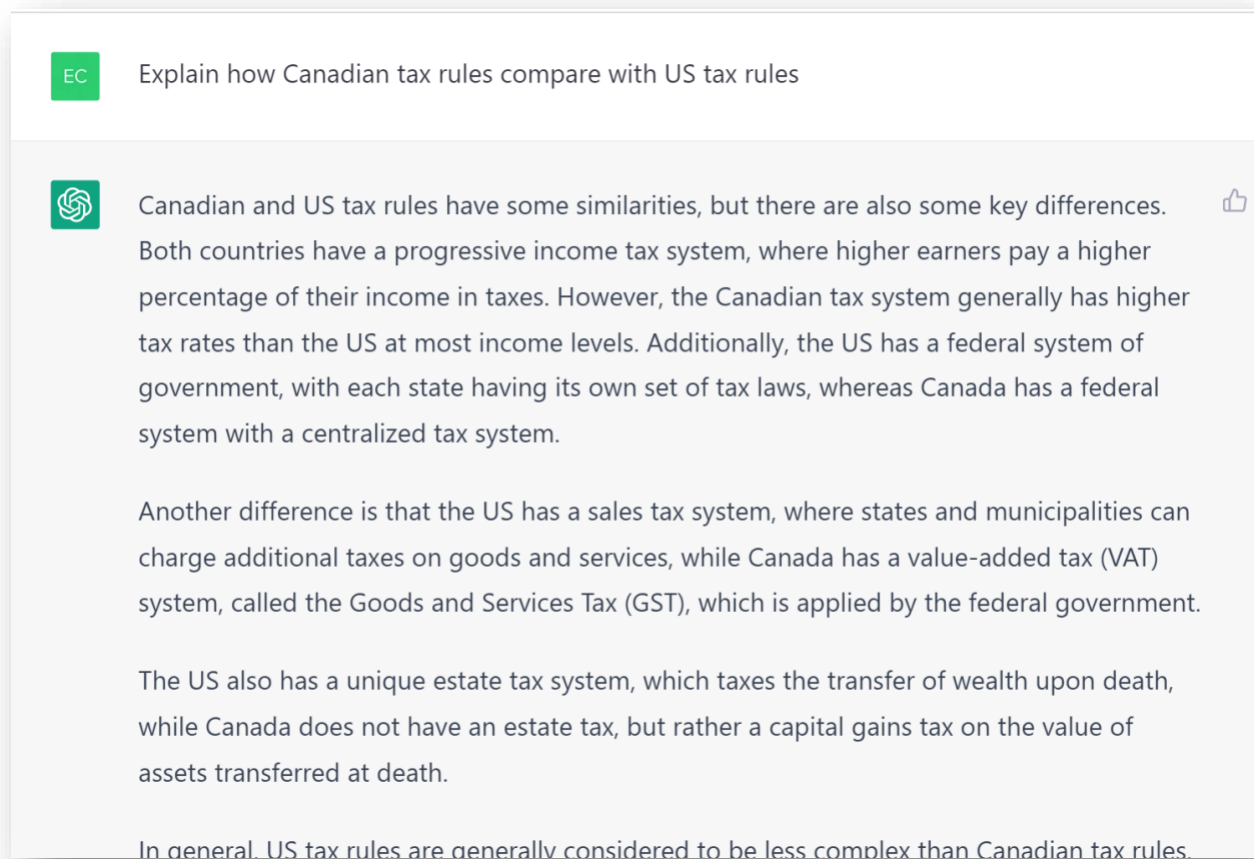
ChatGPT: An introduction

In November 2022, a new conversational artificial intelligence (AI) tool known as ChatGPT¹ was unleashed on the world. Millions of people have become obsessed – or at least are wowed – by what this AI application can do. In its brief public lifetime, it has already brought tens of billions² of dollars in investment offers and had an incredibly disruptive impact on education³ and publication forums. Writers, marketers, advisers and researchers muse on whether they will soon be out of a job. What about the direct impact on the financial profession?

On the surface, ChatGPT is like having a really, really, really smart and incredibly knowledgeable (but still fallible) friend who can type very, very quickly, is moral but doesn’t bear a grudge, and has an incredibly wide range of knowledge. It is as facile with 1980 British comedy shows as with US GAAP and IFRS, with theology as with taxation. See Figure 1.



Figure 1: How ChatGPT Is Trained On Theolog



The screenshot shows a chat interface with a user prompt and a GPT response. The user prompt is: "Explain how Canadian tax rules compare with US tax rules". The GPT response is: "Canadian and US tax rules have some similarities, but there are also some key differences. Both countries have a progressive income tax system, where higher earners pay a higher percentage of their income in taxes. However, the Canadian tax system generally has higher tax rates than the US at most income levels. Additionally, the US has a federal system of government, with each state having its own set of tax laws, whereas Canada has a federal system with a centralized tax system. Another difference is that the US has a sales tax system, where states and municipalities can charge additional taxes on goods and services, while Canada has a value-added tax (VAT) system, called the Goods and Services Tax (GST), which is applied by the federal government. The US also has a unique estate tax system, which taxes the transfer of wealth upon death, while Canada does not have an estate tax, but rather a capital gains tax on the value of assets transferred at death. In general, US tax rules are generally considered to be less complex than Canadian tax rules."

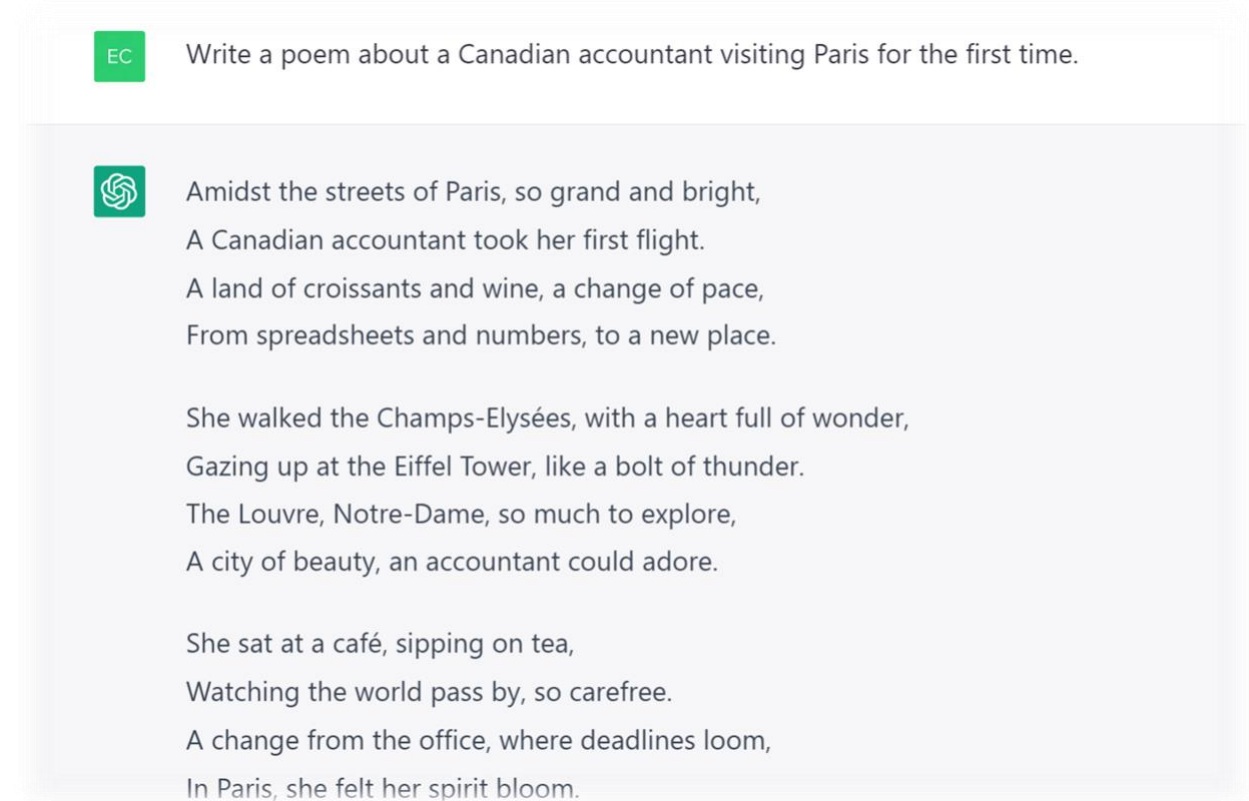
y And Taxation, Poetry And Pro-Formas

It interacts with the user conversationally. You have a dialogue with it, giving it information, asking it questions and seeking clarification or fine tuning the interaction. It admits mistakes, challenges inappropriate requests, and programmatically has a bit of sharp wit to it. ChatGPT does not have access to the Web to look up information it has not already been trained on, and the vast knowledge it has currently ends in 2021. While interaction is enormously simple, getting the right answer often depends on the user tweaking the conversation just the right way.

The GPT part of ChatGPT stands for “Generative Pre-trained Transformer.” Perhaps oversimplified, that means it takes your text prompt as input and uses the information it was trained on to create responses. That response may be a simple answer, and ChatGPT as a better front-end for search engines is broadly contemplated. However, ChatGPT has been trained on how to produce more specific kinds of responses, able to produce song lyrics, poetry, advertising copy⁴, contract templates, financial statements, and many other specific document formats (See **Error! Reference source not found.**). In two months, the power of ChatGPT in


creating content has been so evident, there is already controversy about ChatGPT being listed as co-author on research papers. While AI and IP is a longstanding issue⁵, ChatGPT has brought the issue to the forefront.

Figure 2: Poetic style or legal contracts – ChatGPT Can Create It



The screenshot shows a chat window with a user prompt and a generated response. The user prompt is: "Write a poem about a Canadian accountant visiting Paris for the first time." The response is a poem about a Canadian accountant's first visit to Paris, mentioning landmarks like the Eiffel Tower and the Louvre, and describing the experience of walking through the city and sitting at a café.

EC Write a poem about a Canadian accountant visiting Paris for the first time.

 Amidst the streets of Paris, so grand and bright,
A Canadian accountant took her first flight.
A land of croissants and wine, a change of pace,
From spreadsheets and numbers, to a new place.

She walked the Champs-Élysées, with a heart full of wonder,
Gazing up at the Eiffel Tower, like a bolt of thunder.
The Louvre, Notre-Dame, so much to explore,
A city of beauty, an accountant could adore.

She sat at a café, sipping on tea,
Watching the world pass by, so carefree.
A change from the office, where deadlines loom,
In Paris, she felt her spirit bloom.

At the present time, exploring the basic power of ChatGPT is free to users, with paid options. Access to the free version is often limited, as so many people are trying to use it that the system is often over capacity. Other options to access ChatGPT are already being announced, including Microsoft announcing plans to incorporate it into Azure OpenAI Service.⁶ While the online version has been trained with a huge amount of background information, users can create their own instance of ChatGPT, although collecting and preprocessing a huge amount of information is necessary for that to be successful.

Above all, it is important to remember ChatGPT is a tool that can accelerate many human endeavors. In the right hands, it can facilitate creativity, accelerated learning, and rapid publication. In the wrong hands, bad things can happen. It is a *conversational* tool – as the pandemic brought insulation and interpersonal challenges, it can be very satisfying for those insulated by circumstance to have an incredibly knowledgeable, non-judgmental, conversational partner as ready to discuss philosophy as technology, the arts and accounting.

Interacting with ChatGPT

As you have seen in the illustrations, ChatGPT interactions begin with the user making a statement, posing a request, or asking a question. The statement can be to add context, such as “Let’s pretend you are a staff accountant at a CPA firm,”⁷ that will drive the conversation. ChatGPT interprets the request and responds. During the course of a conversation, ChatGPT “remembers” what was discussed earlier in the conversation, so topics can easily be built-upon or otherwise tweaked.

It is important to remember, however, that it is a “large language model trained by OpenAI.”⁸ That means it has limitations. These include:

- It is not itself connected to the Web. However, it can work with programs, leverage APIs, and act beyond its native capabilities. It can interact with UiPath and other Robotic Process Automation tools.
- It does not experience time or perceive the world outside of text-based interactions. You can’t ask about your weather today.
- It does not have personal preferences or opinions or make judgements about questions asked of it – however, clever queries get around that limitation. Ask it if Kirk or Picard was the better Star Trek captain, and it will push back. But ask why people might prefer Kirk to Picard or the other way around, and it won’t shut up.
- It is highly literal. I asked it “where the kookaburra sits,” referencing the song “Kookaburra Sits in the Old Gum Tree.” The initial response ignored the song, but when I followed up, it told me about the background of the song, its inaccuracies (“while the song is a fun and catchy tune, it is not entirely accurate when it comes to the kookaburra's diet and behavior”) and schooled me on my question.

For those of us accustomed to working with an AI agent like Siri, Google Assistant or Alexa, there is a small learning curve. The personal assistants open applications, update your calendar, and dim the lights while changing the television channel. ChatGPT is like conversing with a person, meant to engage in long conversations. ChatGPT can create a financial statement from underlying data (see the Addendum for a simple example of that process), provide a draft outline for an article, presentation or seminar, and lead the user through the thought process on just about any topic.

What the user gets out of it, however, is highly dependent on what they put in; the experienced user will get different results than what a newcomer would. Ask ChatGPT a general question (e.g., “What might a sales agreement between an agricultural firm and a nursery look like?”), you get a general answer. But push the point (e.g., “What might the agreement actually look like?”), and it prepares the document for you. (See **Error! Reference source not found.**)

My experience is that ChatGPT pushed back when asked to create or provide feedback on Python programming code or XML instance documents but, when pushed, did an admirable job at these tasks. The potential for ChatGPT to perform an initial review of smart contract code or track changes may be useful in accelerating a blockchain-enabled business world.

Figure 3: Agreement for The Sale Of Plants

AGREEMENT FOR SALE OF PLANTS

This Agreement, made and entered into on the date of acceptance of this agreement by the buyer, by and between (Agricultural firm name) (hereinafter referred to as "Seller") and (Nursery name) (hereinafter referred to as "Buyer").

1. Parties: The parties to this Agreement are the Seller and the Buyer.
2. Description of Goods: The Seller agrees to sell and the Buyer agrees to purchase the following plants (hereinafter referred to as "Goods"):

(a) Type of plants: _____ (b) Variety: _____ (c) Quantity: _____ (d) Any other relevant details: _____

3. Price and Payment Terms: The price for the Goods shall be (insert price) per unit and the Buyer shall make payment as follows:

(a) _____ percent upon acceptance of this Agreement (b) _____ percent upon delivery of

Potential Benefits of ChatGPT for the Financial Professional

The broad availability of ChatGPT has made the potential of AI to help the financial professional in many ways far more obvious. We will cover the risks ... such as whether the professional will rely on AI and especially the amazing but limited ChatGPT rather than engaging a human expert where the expert is the far better answer ... below. But first, we should examine the possibilities.

Almost an expert system

ChatGPT is trained on a wide variety of topics, including accounting and auditing ... although only through 2021. In seconds, ChatGPT can provide a starting point for research on any topic. The profession has researched expert systems for years, the pandemic made it difficult for juniors to get in touch with managers for direction, and ChatGPT has quickly led forward on three of the four components of expert systems (the knowledge base, the search/inference system, and the user interface); the knowledge acquisition cannot be far behind.

ChatGPT can be used to help prepare users with knowledge specific to the work they need to do (see **Figure 3**), develop specialized audit checklists, assisting in the development of the audit documentation and outlining the presentation to the audit committee, and otherwise streamline work flows. The dialogue approach, combined with the ability to establish a context, could lead to ChatGPT being used to interview clients, their experts, or other third parties.

Figure 3: Specialized Audit Guidance

When auditing inventory for an agricultural organization, there are a few key things to pay attention to:

1. **Accurate counts:** Ensure that the physical counts of inventory match the recorded quantities in the organization's inventory management system.
2. **Valuation:** Check that the organization is valuing its inventory correctly, in accordance with generally accepted accounting principles (GAAP) or International Financial Reporting Standards (IFRS).
3. **Aging:** Review the organization's aging report to ensure that slow-moving or obsolete inventory is identified and properly accounted for.
4. **Documentation:** Make sure that proper documentation, such as purchase orders, invoices, and receiving reports, is on file to support the organization's inventory counts and values.
5. **Compliance:** Verify that the organization is compliant with any relevant laws, regulations, or industry standards related to inventory management and storage.
6. **Pest Management:** verify that the organization have implemented pest management system and have records of it.
7. **Temperature control:** verify that the organization have implemented temperature control systems in storage area and have records of it.

Enabling The Knowledge Worker

I have only begun to find the ways ChatGPT can help me in my everyday work. It can create presentations, it can do so in different languages (“how would I say that in Chinese, Japanese and Russian?”) and assuming different tone (“how would that sound if spoken by William Shakespeare, e.e. cummings or Robert Frost?”) and in brief or more detailed iterations.

ChatGPT may help in understanding the company and its environment and other due diligence tasks. For example, it may help the user find interrelationships between organizations about which the user was unaware.

I was watching a, older British comedy show, “Father Ted”, which included a fake funny commercial. During the fake commercial, a phone number was given: 0898 333 201. Over to ChatGPT. I asked ChatGPT if it was familiar with a different phone number first –0118 999 881 999 119 7253⁹. Initially, ChatGPT just replied why it is not a valid phone number but - given additional context that it was from “The IT Crowd” - it offered a bit more background. Then on to 0898 333 201. It offered that the phone number was used on the BBC Radio 4 comedy series "I'm Sorry I Haven't a Clue". The number is the fictitious "Answerphone" number. When I asked about “Father Ted”, ChatGPT let me know it was indeed also used on “Father Ted”, that it was broadcast on the same network and written by the same team as “I’m Sorry I Haven’t a Clue”, a relationship of which I was unaware.

Risks

There’s an old adage that every change brings loss, and every loss has risks. Reiterating a prior point, ChatGPT is an incredible opportunity to sit down with a powerful and broadly user-friendly tool to be able to see what it can do and begin to think through the potential benefits, the related risks, and consider the means of remediating the risks to be able to enhance the

benefits. Most of the general risks people are talking about are not new because of ChatGPT, but the availability of this powerful tool has exacerbated them.

Students are using ChatGPT to cheat. They are submitting essays that ChatGPT prepared instead of creating their own work. They are doing homework and taking tests and having ChatGPT come up with the answers. While ChatGPT makes it easy, however, students have gotten copies of homework and tests from students who took the course before, subscribed to services like Chegg, Course Hero or Quizlet, or went online to Reddit's r/Accounting forum for help for years.

White hat hackers (the good guys) have been exposing that ChatGPT gave them guidance on how to hack a web site or create malware,¹⁰ under the pretense that it was information to help a company prepare itself against hackers. I tried to have ChatGPT tell me how my clients might seek to fool me with ChatGPT ... I was *not* able to convince it to help me, so they may have altered their algorithms.

Client Privacy and Confidentiality Issues

Users are encouraged to be careful not to type confidential information into the tool. The financial professional has legal and ethical responsibilities related to privacy and confidentiality, and the allure of the tool may lead to information being disclosed that should not be disclosed.

The same power that may make ChatGPT great or interviewing means that employees might be directed with falsified emails to a ChatGPT instance where they are interrogated and confidential information is extracted. Social engineering attacks may lead to breaches in cybersecurity.

Misinformation And Inability to Properly Interpret Appropriate Information

So, it becomes obvious that ChatGPT can be an engaging way to get answers to questions and scenarios where developing the background and expertise would take a great deal of effort. That in itself means that misinformation may be missed and even correct information might be out of context. The OpenAi folks themselves note that ChatGPT can produce "plausible-sounding but incorrect or nonsensical answers."

When I teach about how the Extensible Markup Language (XML) and the Extensible Business Reporting Language (XBRL) reduce ambiguity in business communication to students, I ask them if they can find ambiguity in the business request to "Please deposit \$50,000 into my CA bank account on 02/02/23." I asked ChatGPT if there were ambiguities to be cleared up in that statement, and it initially said "No." But as I pushed – is "\$" unambiguous? How about the date 02/02/23? How about CA? (Canada, California, or some other identifier?) – it capitulated that these were issues with regional and other challenges.

Undermining The Quality of Audit Evidence

ChatGPT accelerates the process of creating any number of customized documents. Frauds involving the creation of customized documents polluting the audit trail fill the textbooks. Certainly, this isn't new – malfeasance using falsified documents has been around a very long time. However, documents, reports and other content created with AI can make identifying falsified documents more difficult than ever before.

Combinations of DeepFakes and conversational AI like ChatGPT can make video more difficult to trust than ever before.

Where Does it Go from Here?

In a very brief period of time, ChatGPT hit one million users within five days, and is now a constant topic of discussion in the news. It is at the same time simple and yet filled with layers of possibilities, able to accelerate learning and publication, limited and seemingly limitless. It is a tool that has inspired interest from Microsoft, which has already announced incorporating it into its toolset.

Universities and school systems are trying to figure out how to block it or identify when students are providing their own work. Those who make money creating and publishing the printed word are concerned ChatGPT is the most disruptive technology in 100 years, a virus let loose.¹¹

For the financial professional, it is one more emerging technology that can impact education and training, communication and messaging, facilitating our daily tasks, but accelerating the threats and risks of which we need to be aware.

The profession has spoken about the potential of AI for decades, but had little tangible, to touch and taste and see, to experience the possibilities. With ChatGPT, the opportunity to experience the future is here.

Addendum:

Following is another example dialogue, where ChatGPT takes simple information for an Income Statement, formats it, and facilitates analytics and enhancement:

If you receive a simple financial statement like the following, what are some analytics you might perform? 2022 2021 Sales 150 100 Cost of sales 50 40 Net Income 100 60

Some analytics that could be performed on this financial statement include:

- Calculating the gross profit margin by dividing net income by sales
- Comparing the net income and gross profit margin between 2022 and 2021 to determine if there has been an improvement or decline
- Comparing the cost of sales as a percentage of total sales in 2022 and 2021
- Calculating the average sales per day or month
- Calculating the sales growth rate between 2022 and 2021.

Can you turn that data into a financial statement format, and include the gross profit calculation?

Sure, here's a financial statement format that includes the calculation of gross profit:

Income Statement

Year ended December 31, 2022 and 2021

2022 2021

Sales \$150 \$100

Cost of sales \$50 \$40

Gross profit \$100 \$60

Net Income \$100 \$60

Gross profit margin: $\text{Gross profit} / \text{Sales} = 100/150 = 66.67\%$ (2022) & $60/100 = 60\%$ (2021)

Thanks! Can you add a column showing the percentage increase or decrease from 2021 to 2022?

Sure, here's the financial statement with a column showing the percentage increase or decrease from 2021 to 2022:

Income Statement

Year ended December 31, 2022 and 2021

2022 2021 % change

Sales \$150 \$100 50%

Cost of sales \$50 \$40 25%

Gross profit \$100 \$60 66.67%

Net Income \$100 \$60 66.67%

Gross profit margin: $\text{Gross profit} / \text{Sales} = 100/150 = 66.67\%$ (2022) & $60/100 = 60\%$ (2021)

It is worth noting that to calculate percentage change we use the following formula: $(\text{New value} - \text{Old value}) / \text{Old value} * 100$

Please present it in a tabular format, with a bold underline under Cost of Sales, and a bold double underling under Net Income.

Sure, here's the financial statement presented in a tabular format with the formatting you requested:

Year ended December 31, 2022 and 2021	2022	2021	% change
Sales	\$150	\$100	50%
Cost of sales	\$50	\$40	25%
Gross profit	\$100	\$60	66.67%
Net Income	\$100	\$60	66.67%

Gross profit margin: $\text{Gross profit} / \text{Sales} = 100/150 = 66.67\%$ (2022) & $60/100 = 60\%$ (2021)

It is worth noting that the tabular format is a good way to present the information in a clear and concise way, and the bold underline and double underline are used to highlight important information, such as cost of sales and net income.

Let's add management salary (which would be Operating Expense, a deduction from Gross Profit, reducing Net Income) of \$60 for 2022 and \$30 for 2021. Could you update the presentation?

Sure, here's the financial statement with the inclusion of management salary (Operating Expense) and the updated presentation:

Year ended December 31, 2022 and 2021	2022	2021	% change
Sales	\$150	\$100	50%
Cost of sales	\$50	\$40	25%
Gross profit	\$100	\$60	66.67%
Operating Expense (Management Salary)	\$60	\$30	100%
Net Income	\$40	\$30	33.33%

Gross profit margin: $\text{Gross profit} / \text{Sales} = (100-60)/150 = 40/150 = 26.67\%$ (2022) & $(60-30)/100 = 30/100 = 30\%$ (2021)

It is worth noting that the management salary (Operating Expense) is a deduction from Gross Profit, which reduces the Net Income. As we can see the percentage change in net income is different than the percentage change in sales, this is because the management salary as an operating expense is considered while calculating Net Income percentage change.

¹ <https://chat.openai.com/>.

² See, for example, Microsoft <https://www.msn.com/en-gb/money/other/microsoft-is-said-to-mull-dollar10-billion-chatgpt-creator-investment/vi-AA16c68t?ocid=up97dhp>.

³ <https://www.nytimes.com/2023/01/16/technology/chatgpt-artificial-intelligence-universities.html>.

⁴ Ryan Reynolds has a video of his use of ChatGPT to create a Mint Mobile ad at <https://www.youtube.com/watch?v=eHjifELI-k>.

⁵ Many countries have made or are considering issues of AI and patents; the United States Patent and Trademark Office active seeks to engage the AI/ET community through its AI and Emerging Technology Partnership at <https://www.uspto.gov/initiatives/artificial-intelligence/ai-and-emerging-technology-partnership-engagement-and-events> ; there has been a longer standing issue related to animals and authorship/patents, which go beyond the scope of this article, but the reader is encouraged to look up the works of F.D.C. Willard.

⁶ <https://azure.microsoft.com/en-us/blog/general-availability-of-azure-openai-service-expands-access-to-large-advanced-ai-models-with-added-enterprise-benefits/>.

⁷ An amusing conversation with this model has been captured at <https://www.goingconcern.com/chatgpt-junior-accountant/> based on the work of Jason Staats <https://twitter.com/JStaatsCPA/>.

⁸ OpenAI.com.

⁹ <https://www.youtube.com/watch?v=1gcbXly2YNE>.

¹⁰ <https://research.checkpoint.com/2023/opwnai-cybercriminals-starting-to-use-chatgpt/>.

¹¹ <https://techcrunch.com/2022/12/09/is-chatgpt-a-virus-that-has-been-released-into-the-wild/>.

