K2's Better Productivity Through Artificial Intelligence And Automation Tools

Continuing Professional Education Series



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Introduction

Three Rules of this Seminar

There Are No Dumb Questions. Please ask questions if you need further explanation. We welcome your questions and will do our best to provide accurate and meaningful answers.

Obtain the Information for Which You Came. If you have a specific interest in a topic, please let us know. If your topic is not part of the course materials, we will do our best to accommodate your request. Your instructor is anxious to meet your needs.

Share and Share-Alike. Your instructor is here to share all possible information related to the course. We hope that you will be willing to do the same. If you have helpful tips or experiences, please share them with the other participants and us.

Course Development

The shareholders, associates, and staff of K2 Enterprises and K2E Canada Inc. developed this course and the related course materials. We aim to deliver quality educational sessions that help you better use and understand the tools and concepts discussed in this session.

We designed our course presentation style for busy professionals. Through numerous short case studies and feature reviews, we strive to deliver concise information in a context that is easy to understand and absorb.

To maximize the use of your time and the benefits of attending this course, we have worked hard to filter out trivial and obscure features. Our goal is not to cover every keystroke and menu option but to provide a fast-paced course focusing on state-of-the-art information technology and what it can do for you and your staff.

About K2 Enterprises

Over more than thirty-one years, our team members have collectively delivered more than 40,000 national and international technology-focused seminars, webinars, and conferences. To help us stay on top of technology, our team members read numerous technology trade magazines, attend many technology conferences, and talk with multiple technology companies yearly to obtain the latest information to include in our courses. Also, we experience everything we teach and recommend to our audiences. Because our shareholders and associates reside in different states and provinces, using technology efficiently and appropriately is necessary for our business's success and survival.

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Our Mission Statement

K2 aims to produce and deliver the highest quality technology seminars and conferences to business professionals. We work cooperatively with professional organizations such as state CPA societies, associations of Chartered Professional Accountants, and vendors of technology products. We make every effort to maintain high integrity, family values, and friendship among all involved.

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On-Site Training

Working cooperatively with state CPA organizations and associations of Chartered Professional Accountants, we are pleased to offer all our seminars and conference sessions as on-site training opportunities. On-site training provides companies of all sizes with numerous advantages, including the following.

Customization. K2 can customize the content of all on-site training events to meet your organization's specific needs. For example, we can combine selected parts of existing courses into a focused learning experience to meet your team's needs. Likewise, we can develop custom content from the ground up and deliver it to your team members, ensuring we meet your training objectives.

Cost savings. For organizations of all sizes, on-site training can provide significant cost savings compared to public training venues. In addition to potentially reduced registration fees, these cost savings materialize in the form of reduced travel costs and reducing the amount of time team members spend away from the office.

Convenience. Because you select your on-site training event's date, time, and location, on-site training is more convenient for you and your team than traditional training options. Many organizations schedule on-site training with staff meetings, retreats, and customer/client events to leverage the value of all participants' time.

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Introducing Artificial Intelligence And Automation

Chapter 1

Artificial Intelligence (AI) and automation are two of the most significant technologies for business professionals today. These tools offer numerous advantages to those who choose to embrace them. Efficiency, accuracy, and improved internal control are all advantages of AI and automation. This course will teach you how to use these tools to work more efficiently and effectively. In this chapter, we introduce AI and automation, some of the key benefits of using these tools, and the risks associated with AI and automation.

Learning Objectives

Upon completing this chapter, you should be able to:

- Define AI and automation, and list examples of where these tools might be useful;
- Identify some of the risks associated with AI and automation; and
- List examples of technology providers servicing these markets.

Defining Artificial Intelligence

Many definitions of AI exist, and it is likely that no single AI definition fully encompasses all of its aspects. However, for purposes of this class, we define AI as *using technology to mimic human behavior to complete tasks otherwise performed by humans*. This definition means that AI tools must be able to understand and respond to requests, engage in reasoning, learn from prior experiences, and make decisions based on the inputs provided.

Most who study this field subdivide AI into two categories: *narrow AI* and *general AI*. As its name implies, business professionals use narrow AI for focused, specific tasks. On the other hand, general AI is much broader and can include characteristics such as creativity, planning, and reasoning. While narrow AI is very much available today, general AI is a bit more elusive, and few general AI tools exist today.

To illustrate, let's consider an elementary example of narrow AI – junk mail filtering. When you receive an email from someone from whom you no longer want to receive emails, you might choose to block that sender in your email client or service. Upon blocking that sender, your technology "learns" that you no longer want to receive messages from that sender. In turn, it blocks all future emails from that sender.

As indicated above, general AI is a form of AI that can complete any tasks that humans might otherwise perform, theoretically at least. Because of this characteristic, general AI is more of a concept today than a reality. However, as AI advances over the coming decades and centuries,

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AI could morph so that AI tools can perform any task that a human can. This possibility means that traits such as creativity, planning, and reasoning could appear in AI tools in the future. General AI is a distant goal; few examples exist today.

Generative AI – The New Kid In Town

The arrival of ChatGPT in November of 2022 marked a new era in the AI world. Specifically, ChatGPT was among the first *generative AI* tools, and it created new interest in practical applications of AI. As its name implies, generative AI can create textual responses to your prompts or queries. Additionally, generative AI can create images based on your requests.

At the risk of oversimplifying, in some respects, generative AI works much like everyday search engines, such as Google, Bing, DuckDuckGo, and others. Both classes of tools seek to fulfill users' requests for information. However, significant differences exist between these two technologies. As stated above, generative AI can generate responses to your queries, but it can do much more!

With generative AI, you can issue a prompt to ask your AI tool to do something on your own. Examples of prompts include the following:

- *Create a 500-word summary of generative AI*;
- *Compare and contrast general AI to narrow AI*;
- *Describe in detail the different options for lease accounting*; and
- *Differentiate between 401(k) and 403(b) plans*

For example, suppose you issue the following prompt to a generative AI tool such as Google's Gemini: *Explain The Corporate Transparency Act*. Your initial response may appear like that shown in **Figure 1**.

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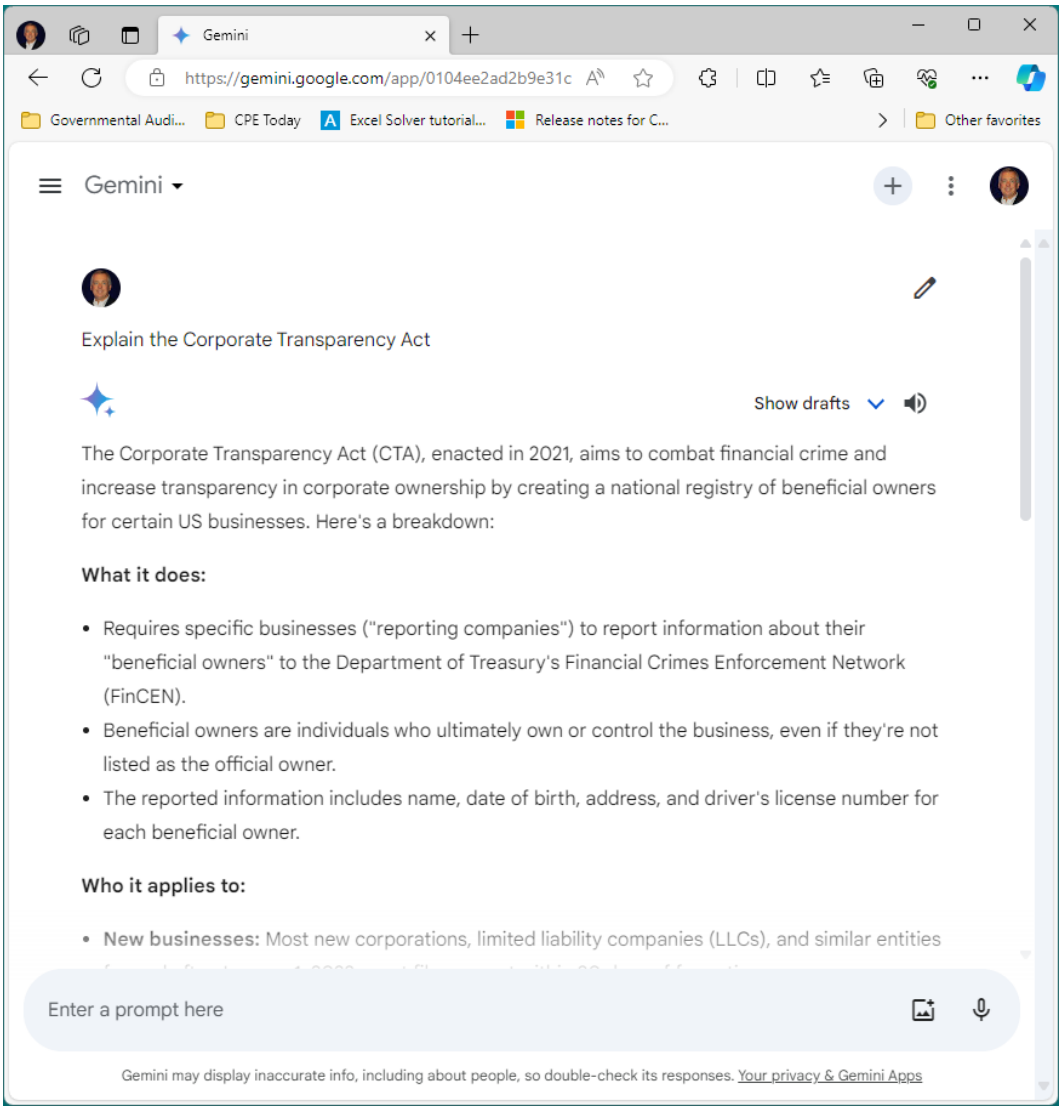

Figure 1 - Sample Response Generated By Google's Gemini AI Tool

Upon receiving the initial response, you could issue a sequential prompt instructing Gemini to *Put the response in memo form*. Upon doing so, the AI platform will convert the initial reply to one formatted as a memo, as shown in **Figure 2**.

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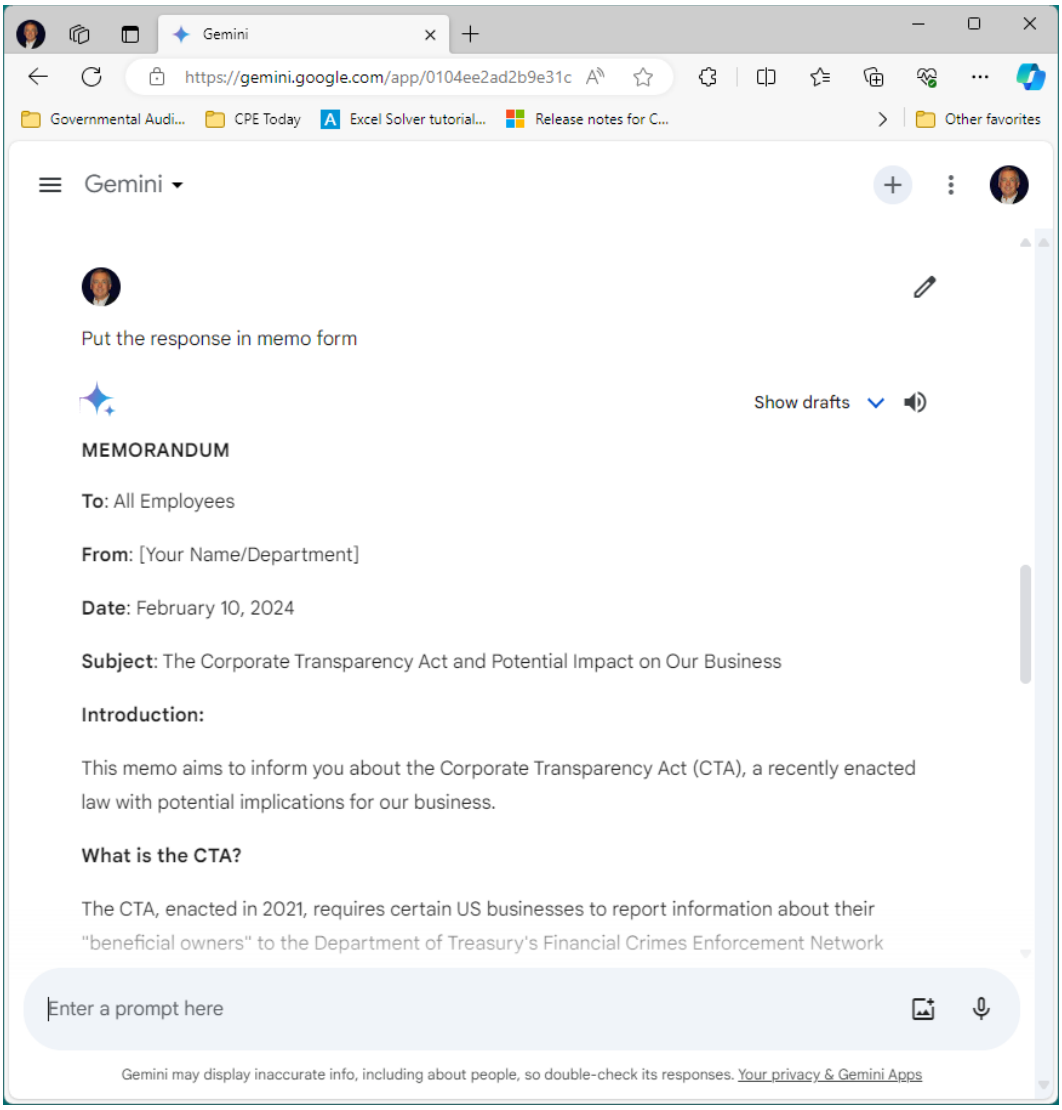

Figure 2 - Modifying The Results Of Query In Gemini

Using this workflow, you can continue to modify your requests so you end up with the information you need in the format you need. Try doing that with a search engine!

Practical Business Applications Of Generative AI

As should be apparent from the discussion above, generative AI can be a proverbial game changer in business environments. Some of the many potential applications of generative AI are listed below.

- Generative AI can be extremely useful for creating content. For instance, you can use generative AI to help create blog posts and memos for clients and associates. To illustrate, you can enter the prompt *Create a memo explaining the difference between S corporation and C corporation taxation* into a generative AI tool, such as Microsoft's Copilot. Upon

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doing so, the service will create text like that shown in **Figure 3**. Once generated, you can use the content as you see fit. For example, you can copy and paste the content to a Word document, PowerPoint presentation, or any other application. Then, you can edit it as you see necessary and appropriate.

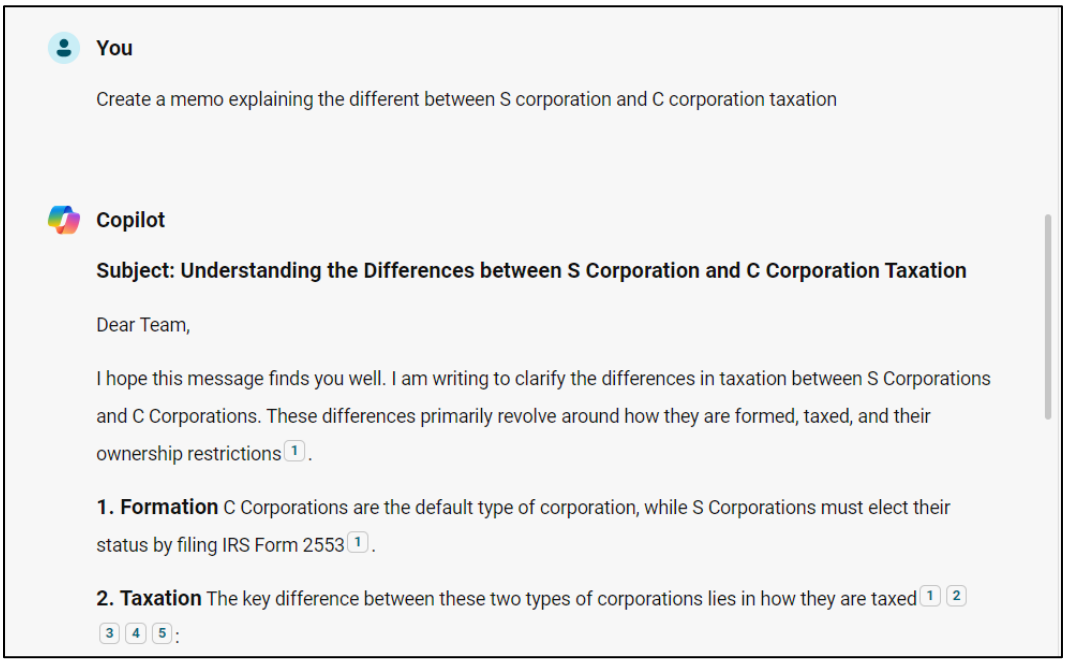

Figure 3 - Using Generative AI To Create A Memo

- Another potential use of generative AI in business settings lies in customer service and support. For example, you can deploy chatbots and virtual assistants that draw on the power of generative AI to respond quickly and accurately to customers' requests and support issues. This AI application can be essential in an era of tight labor markets and – deployed properly – enhance customer and client service efforts.

- Business professionals can also use generative AI to automate routine and repetitive tasks. For instance, you may be able to use generative AI to create draft responses to routine emails, alleviating the need for you to respond manually.

- If you subscribe to Microsoft's Copilot service, you can use that platform to generate a PowerPoint presentation from an existing Word document. Thus, once you finalize the Word document, preparing the PowerPoint slide deck becomes a trivial task, consuming only a fraction of the time otherwise necessary. **Figure 4** illustrates that process.

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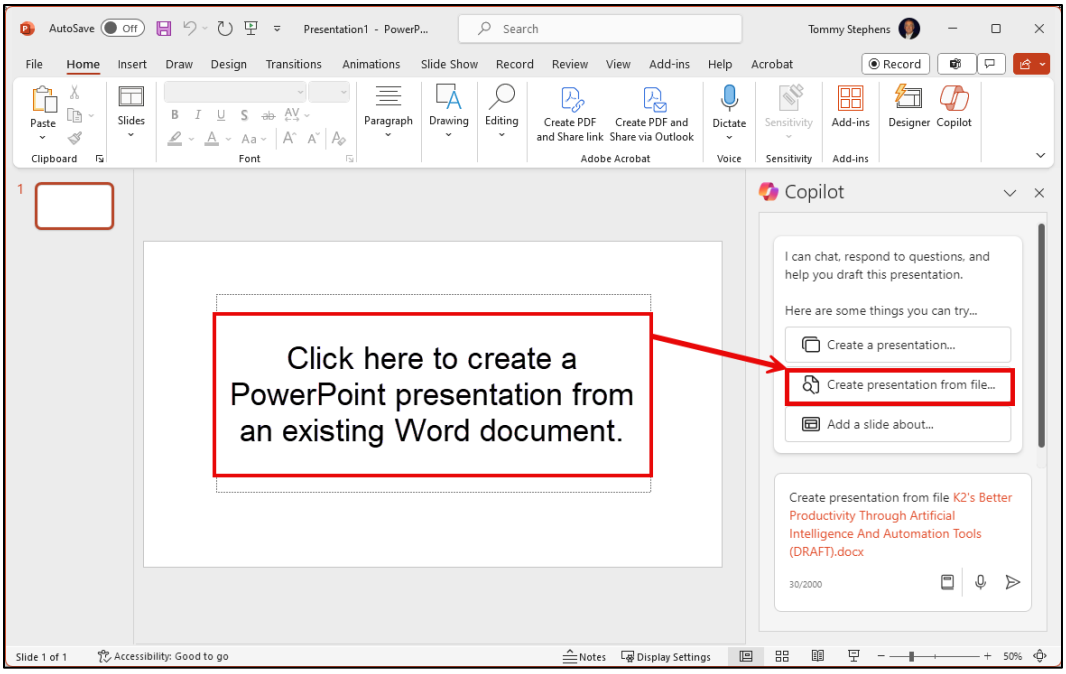

Figure 4 - Using Generative AI To Create A PowerPoint Presentation From A Word Document

Key Generative AI Limitations

Despite generative AI's tremendous capabilities today, these tools have some critical limitations and risks. Failing to understand these issues can lead to disappointing results. One of the most significant limitations is generative AI's dependence on the data used to train the platforms. To the extent the Large Language Model (LLM) used by a generative AI tool contains bias, is insufficiently trained, or otherwise compromised, the tool's results will be compromised. Further, LLMs are incapable (at least for now!) of original thought. Thus, they only "understand" the relationships between words in the context in which they are trained on these words. Stated differently, LLMs do not have a "real" understanding of underlying context or concepts, and, as a result, this can sometimes lead to disappointing results.

Another critical concern associated with generative AI is the lack of transparency in the results. For instance, at the end-user level, how do we know that the results generated by our AI platforms are correct? How do we explain them to others? How do we know that they are free from bias, whether intentionally inflected or not? This lack of transparency could cause a lack of trust in generative AI results.

In addition to the abovementioned concerns, today's generative AI tools lack significant creativity capabilities. Although the tools can "learn" from their training efforts, they struggle to learn and adapt to content without formal training.

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Generative Pre-Trained Transformers And Large Language Models

Generative pre-trained transformers (GPTs) are an AI technology that uses LLMs to generate text. Developers train LLMs on vast amounts of data and use complex mathematical models to predict the next word or phrase in a text sequence based on the previous words or phrases. This training allows the model to learn the patterns and rules of language, such as grammar, vocabulary, and style.

AI tools like ChatGPT, Gemini, and Copilot use GPTs to create textual responses to prompts or queries. These tools can also create images based on requests. GPTs feed the data to the model one passage at a time and ask it to guess the next word or phrase. The model then compares its guess with the actual word or phrase in the data and adjusts its parameters accordingly. This process repeats until the model makes highly accurate predictions for any text prompt.

Developers can use GPTs for practical business applications, such as creating content, automating routine tasks, and providing customer service and support. However, limitations and risks exist with GPTs. Included are their dependence on the data used to train the platforms and their lack of transparency in the results.

To summarize, GPTs are a powerful AI technology that uses large language models to generate text and images. They have many practical business applications but also possess limitations and risks that we must consider when using them.

Large Language Models (LLMs) are the underlying content sources for generative AI platforms. At their core, LLMs are massive datasets, with content drawn from potentially many sources, including books, newspapers, magazine articles, social media posts, and images. It would be easy – and oversimplistic – to refer to LLMs as databases. However, unlike ordinary databases that store data, as described above, the data contained in an LLM is "trained" to respond to requests.

We know that conventional search engines crawl the Internet, creating massive indices of the content found. Then, when you search for content, search engines access their indices and provide results from them, like finding an item in a book's index. In contrast, developers must *train* LLMs to create responses to users' prompts. Two key factors contribute to this training effort: 1) vast amounts of data and 2) significant amounts of computing power. The data is usually an extensive collection of text and images from various sources, such as traditional databases, the Internet, books, images, or other media. The training involves running complex mathematical models that learn how to predict the next word or phrase in a text sequence based on the previous words or phrases. This way, the model learns the patterns and rules of language, such as grammar, vocabulary, and style.

The LLM "learns" by ingesting data, one passage at a time, and asking it to guess the next word or phrase. Then, the model compares its guess with the actual word or phrase in the data and adjusts its parameters accordingly. This process repeats many times until the model can make highly accurate – albeit not perfect – predictions for any given text prompt. Of course, The more data and computing power the model has, the better it can learn and generate text.

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Another critical capability of LLMs is their ability to translate languages. Suppose, for example, you want to translate the phrase to *describe large language models* from English to French. **Figure 5** shows that the task is simple for ChatGPT to complete. Additionally, notice the second prompt for translating the text to German. Again, this is a simple process for virtually all generative AI tools to complete because of well-trained LLMs.

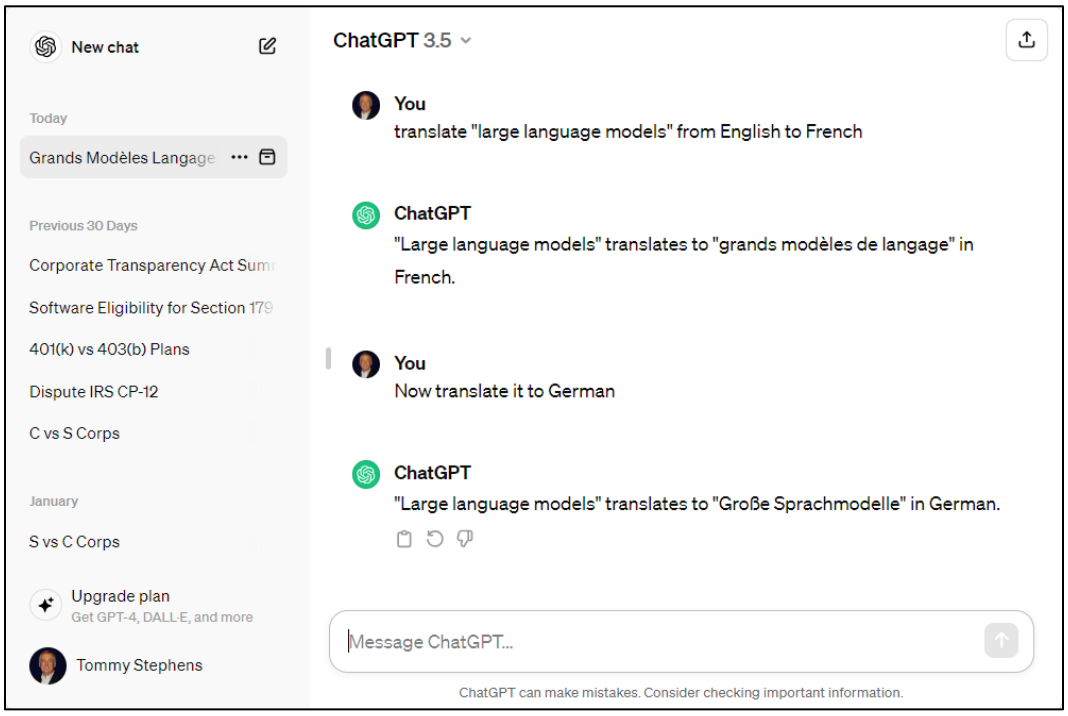

Figure 5 - Using AI To Translate From English To French And Then To German

Another critical factor associated with LLMs is their ability to respond to prompts with as much or as little detail as you may require. Again, this capability is precipitated by training the LLM with vast amounts of data. Thus, when you prompt a generative AI tool to *summarize the differences between S corporations and C corporations*, you may get a response like the one shown below in **Figure 6**. Notice that in the image, there was no request for detailed information.

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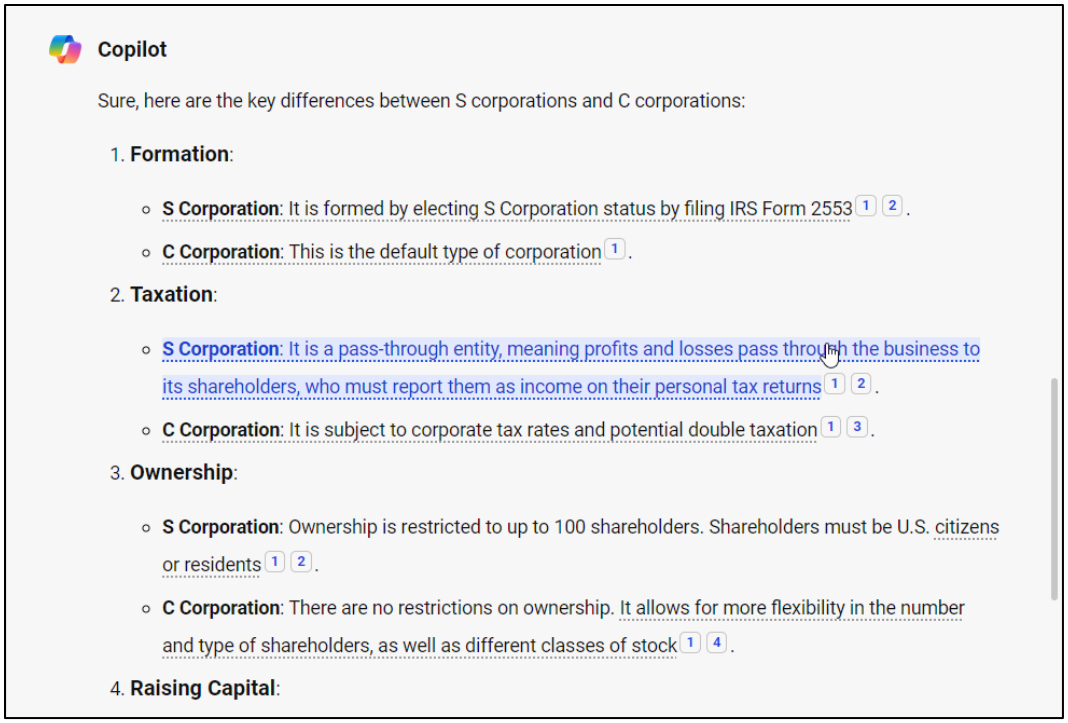

Figure 6 - Results Of An AI Prompt In Summary Form

Now modify the prompt with the phrase *add more details*. Upon doing so, Copilot complies with the request by adding more information, as shown in **Figure 7**.

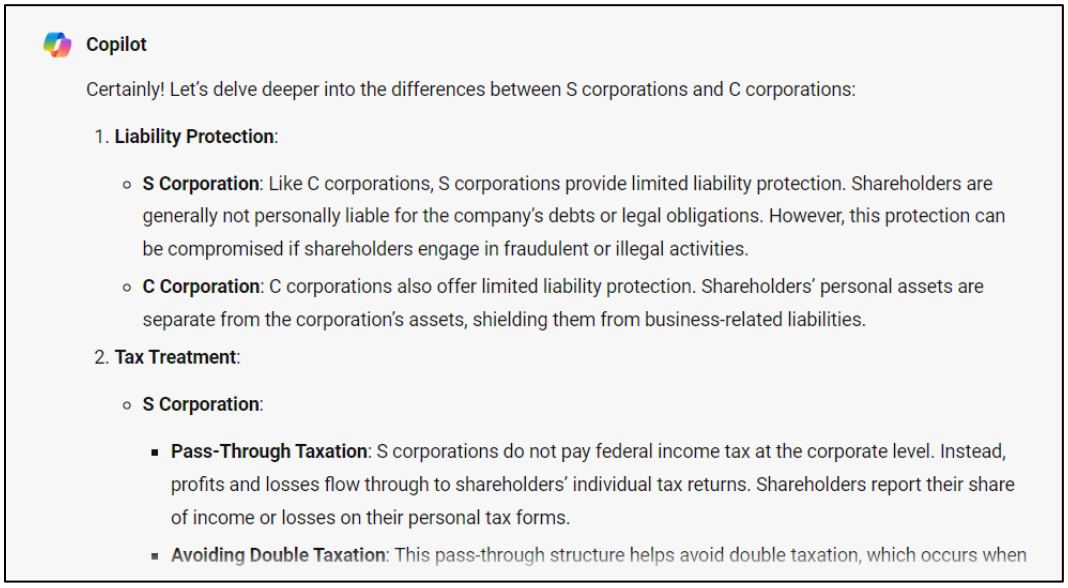

Figure 7 – Results from Modified Prompt

The ability of the LLM to respond with the level of detail requested is a welcome feature provided by robust, well-trained LLMs. For instance, you can use LLMs to assist you with summarizing

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complex topics. In this case, LLMs can condense significant points and provide clear summaries, saving time and effort. You can also use LLMs to engage in open-ended conversations. In business environments, this activity might involve a chatbot engaging in realistic "conversations" with customers to answer their questions without human involvement.

Examples of today's leading LLMs include:

- **GPT-3.5** - Developed by OpenAI, GPT-3.5 is the LLM for ChatGPT 3.5, an upgraded version of ChatGPT 3. GPT3.5 has over 175 billion parameters and works well in responsive environments, such as answering questions and translating languages.

- **GPT-4** – Also developed by OpenAI, GPT-4 is an upgraded version of GPT-3.5. Many who study this topic assume GPT-4 contains over 1.7 trillion parameters. Like its' predecessor, GPT-4 works well in environments where it answers questions and translates languages. In addition to text, GPT-4 also accepts images as inputs. To provide context as to the improvements in GPT-4, it passed a simulated bar exam, scoring in the top 10% of test takers. This achievement starkly contrasts GPT-3.5, which scored in the bottom 10% of test takers.

Risks Associated With Generative AI Powered By LLMs

Of course, notwithstanding the recent success of generative AI powered by LLMs, there are numerous risks associated with this technology, and we should be aware of these concerns. The concerns typically fall into four categories:

1. Ethical and social risks.
2. Economic and labor risks.
3. Legal and regulatory risks.
4. Security and safety risks.

Theoretically, AI and automation can negatively impact human values, rights, and dignity, such as privacy, fairness, accountability, transparency, and safety. This risk is particularly concerning if AI platforms contain intentional or unintentional bias, are discriminatory, or harm groups or individuals purposefully. These concerns increase if AI and automation tools are not designed or deployed with ethical principles and social norms in mind.

These tools can potentially disrupt labor markets by displacing workers. Should that happen, disruption of wealth, income, and political power distribution could occur. Further, this risk could translate into increased unemployment and labor redistribution. These results could have massive social impacts, particularly in education and worker training.

AI and automation can pose challenges and uncertainties for the existing legal and regulatory frameworks, such as intellectual property, liability, consumer protection, and human rights. For example, AI systems can generate new forms of intellectual property, such as data, algorithms, or outputs, that may not be adequately protected or attributed. AI systems can also cause harm

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or damage to humans or property, raising questions about who is responsible and liable for the actions and outcomes of the systems.

AI and automation can increase the vulnerability and exposure of humans and systems to cyberattacks, physical attacks, or accidents. If these issues are left unmanaged, these new technologies potentially create new opportunities, targets, or threats for malicious actors or unintended errors. To illustrate, like existing information technology assets, bad actors can hack AI systems and compromise the security, integrity, or functionality of the systems and their data. Further, like all other information technology assets, AI systems can malfunction, fail, or behave unpredictably, potentially harming or damaging humans and property.

?	What are some of the ways that AI and automation can help you become more efficient and effective? What are some of the roadblocks you might experience when implementing these tools?

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Working With ChatGPT And Gemini

Chapter 2

Perhaps the most widely known and used generative AI tool, OpenAI introduced **ChatGPT** in November 2022. End-user adoption of ChatGPT was quick and massive, with over 100 million users signing up for the service within the first two months. Not to be outdone, Google subsequently introduced **Bard** in February 2023. Google subsequently renamed the service to **Gemini** in February 2024. ChatGPT and Gemini are excellent generative AI tools; in this chapter, you will learn how to use them to increase productivity and efficiency.

Learning Objectives

Upon completing this chapter, you should be able to:

- Name the steps required to access ChatGPT and Gemini;
- List the tasks necessary to query data using ChatGPT and Gemini; and
- Identify examples of best practices associated with using ChatGPT and Gemini.

Getting Started With ChatGPT

To use ChatGPT, you must create a user account with the service. To create an account with ChatGPT, visit https://chat.openai.com/auth/login and click **Sign up**. Upon doing so, you will see a screen like the one pictured in **Figure 8**.

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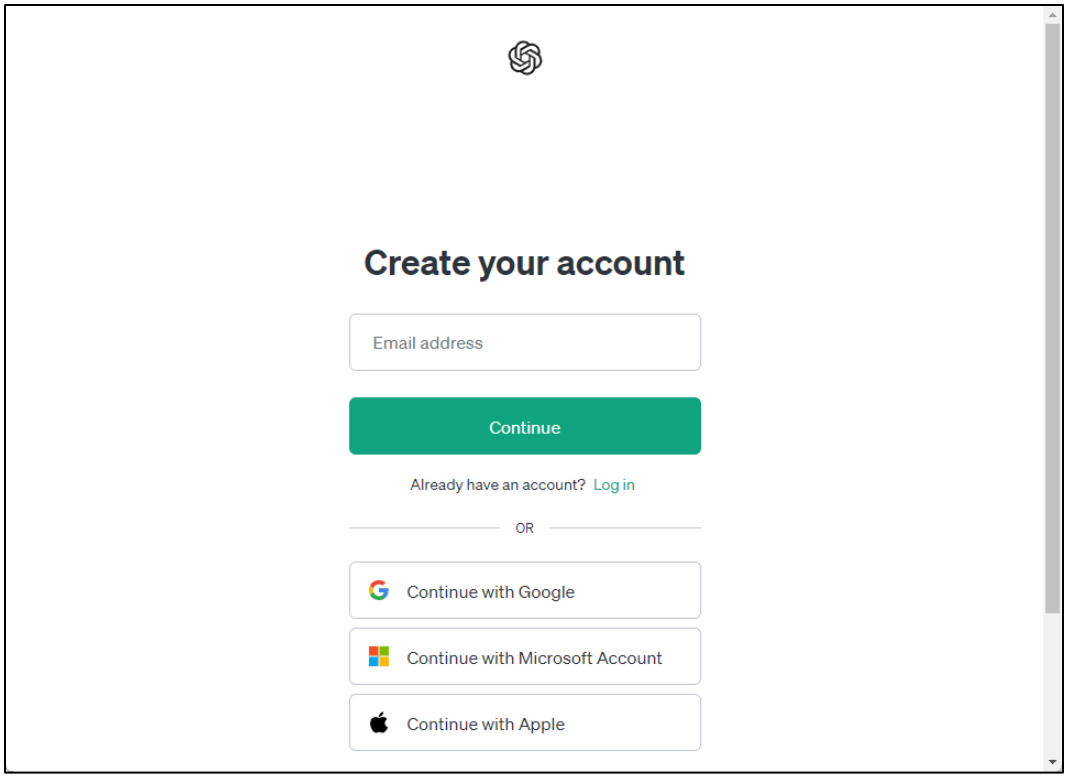

Figure 8 - Creating A ChatGPT Account

Next, enter the email address you wish to associate with the account and click **Continue**. Then, enter a password for your account and click **Continue**. You can also associate your ChatGPT account with your Google, Microsoft, or Apple accounts and log in using those credentials.

While ChatGPT is perceived by many as a free service, it is crucial to recognize that a paid option is also available. According to ChatGPT, the principal differences between the two versions of the service are as follows:

> *The main differences between the paid and free versions of ChatGPT typically revolve around the level of access, features, and usage limits. Here are some common differentiators:*
>
> - *Access to Advanced Features: Paid versions often offer access to advanced features such as longer conversation lengths, increased customization options, specialized APIs for integration with other systems, and priority support.*
>
> - *Conversation Length: Free versions may limit the length of individual conversations or the total number of interactions per month. Paid versions usually offer unlimited or significantly higher conversation lengths and interaction limits.*

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- *Customization and Control: Paid versions often provide more options for customizing the behavior and responses of the AI model. This can include fine-tuning conversation style, tone, and content to better suit specific use cases or industries.*

- *Integration and APIs: Paid versions may come with APIs and SDKs that allow developers to integrate the AI model into their own applications, platforms, or workflows. This enables greater flexibility and control over how the AI is used and accessed.*

- *Priority Support: Paid versions typically come with priority support, ensuring faster response times and dedicated assistance in case of any issues or questions.*

- *Usage Restrictions: Free versions may have usage restrictions such as limitations on the number of users, concurrent sessions, or API calls. Paid versions usually offer higher or unlimited usage allowances.*

If you opt for a paid subscription, your monthly cost will be $20 or $25 per month, depending on whether you choose the **Plus** or **Team** plan.

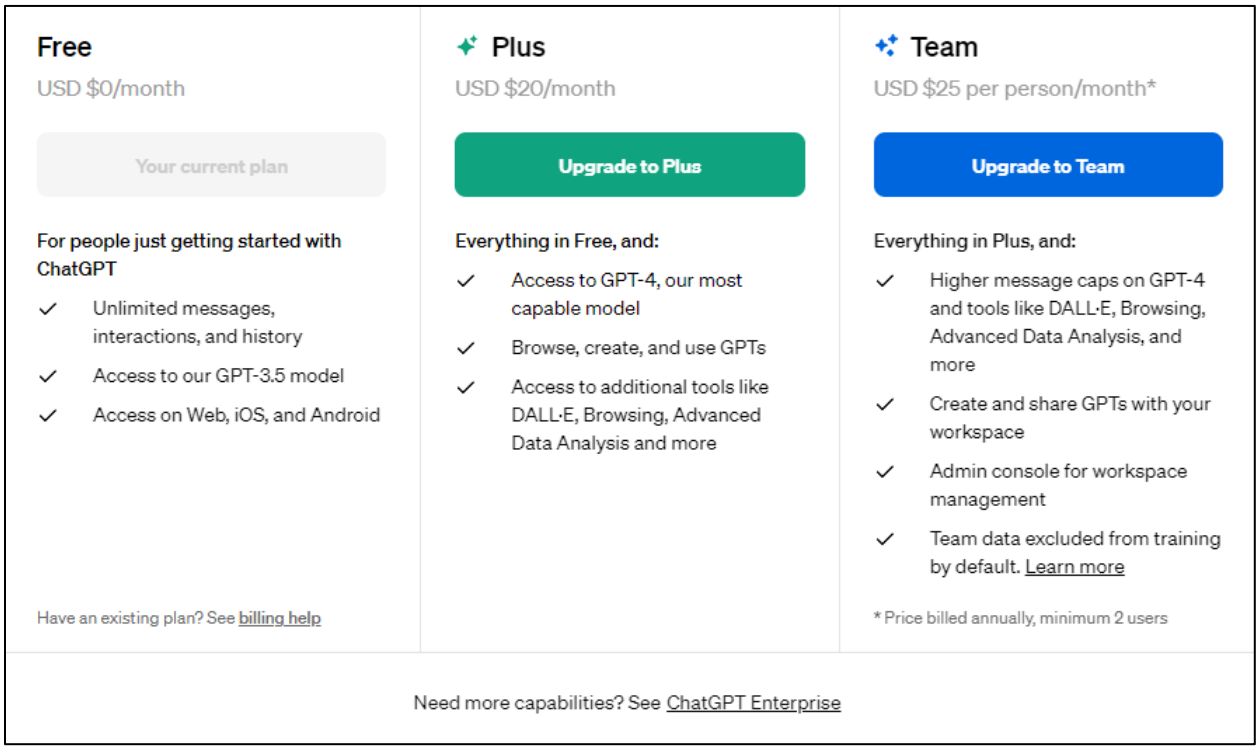

Figure 9 - Distinguishing Between ChatGPT Subscription Offerings

Further, enterprise-level subscriptions are also available for those seeking even more powerful tools, with administrative options available to manage users' accounts. Of course, once you

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create your ChatGPT account, you can begin using it immediately to become more efficient and productive.

In addition to accessing ChatGPT through your browser, you can also access the platform through iOS and Android apps, both of which are available at no charge.

Fundamental Queries Using ChatGPT

For most users – especially those new to generative AI tools – querying data will likely be the most common use case when working with AI. Fortunately, creating these queries is a simple task with ChatGPT and Gemini.

To query data using ChatGPT, begin by logging in to your account. Then, enter your "chat" in the box near the bottom of the screen, as shown in **Figure 10**. In this example, the prompt is *provide an overview of the corporate transparency act*. Note that punctuation, capitalization, and syntax are typically not important when entering your prompts.

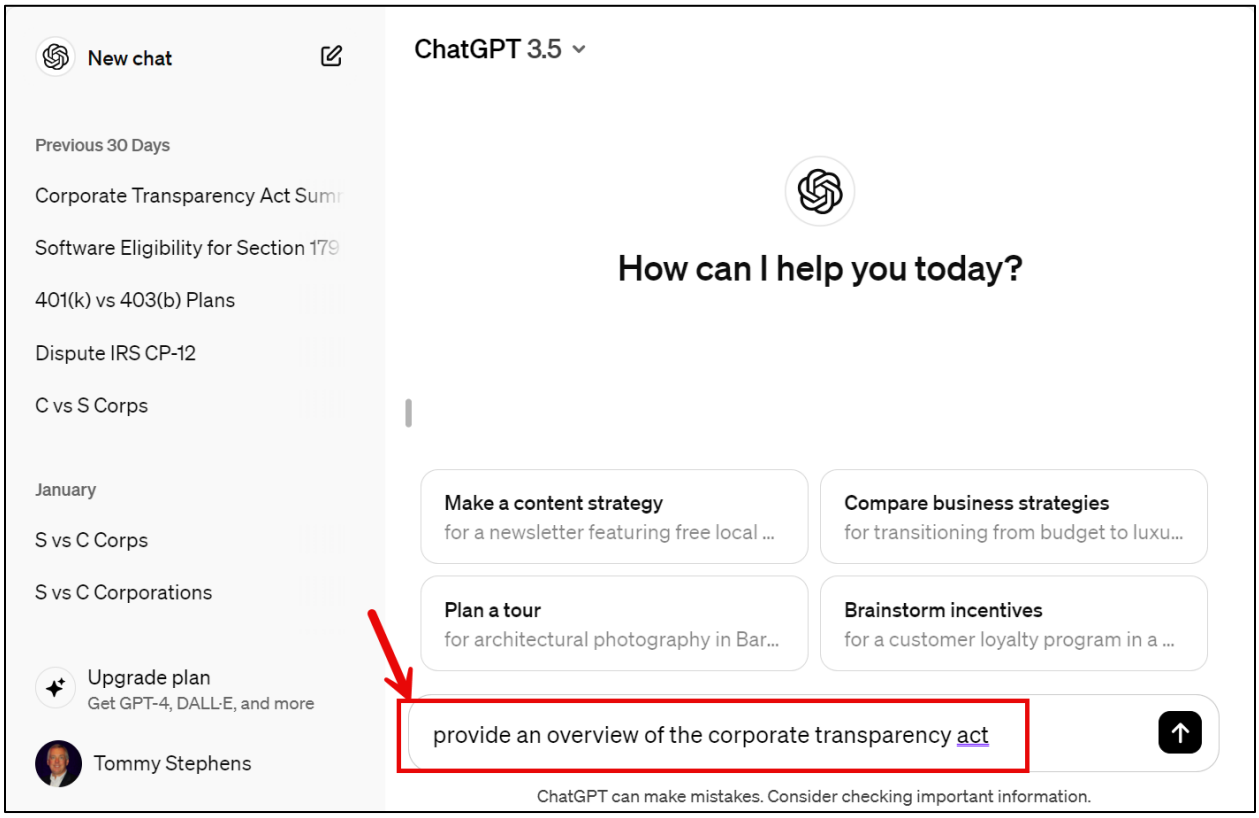

Figure 10 - Launching A Conversation In ChatGPT

Upon doing so, the service returns its initial response to your prompt, as shown in the example in **Figure 11**. And, as helpful as this type of simple query can be, it doesn't fully identify the service's capabilities!

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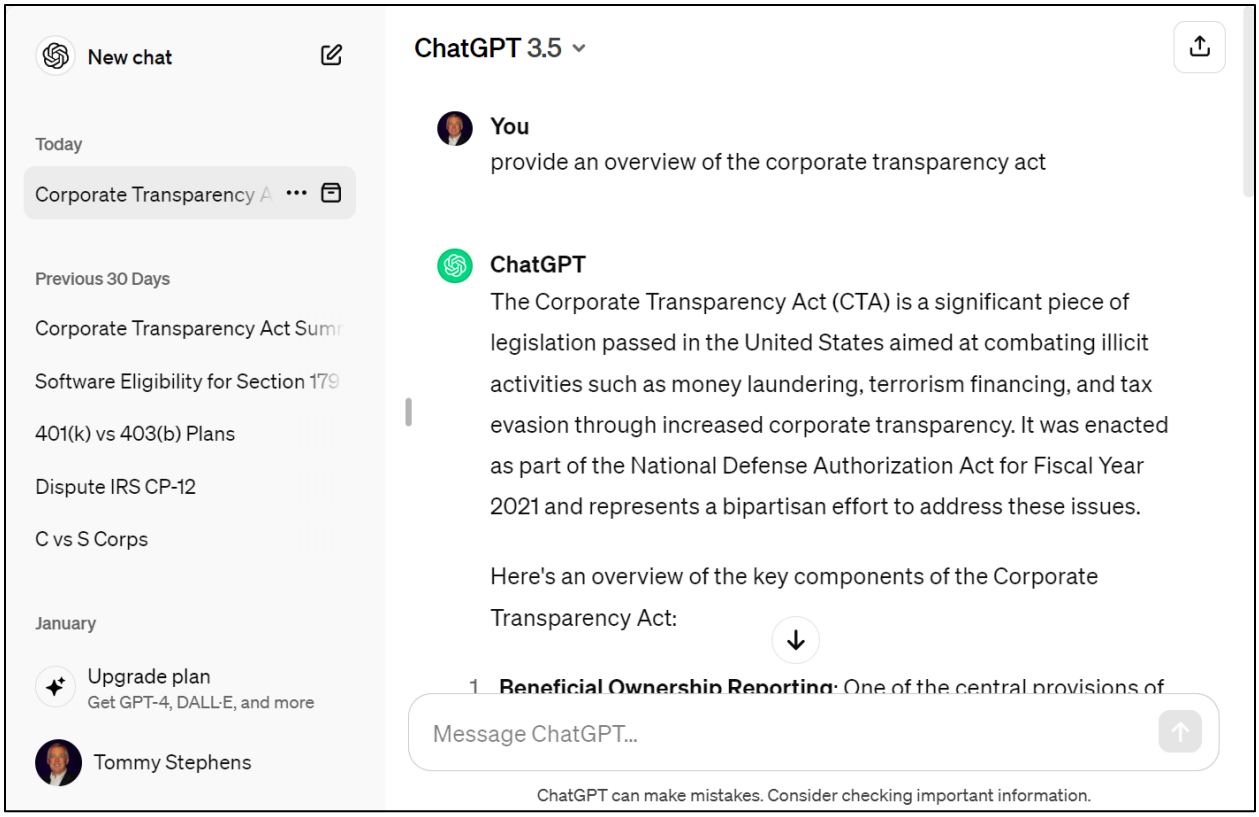

Figure 11 - Sample Response From ChatGPT

Continuing with the previous example, suppose you need the response to your prompt to be in memo format. Sure, you could copy-and-paste the generated text to a word processing application and manually address the formatting issues, but that could be rather time-consuming. Instead, modify your prompt so ChatGPT does the heavy lifting for you.

To modify the query, enter *place the results in memo format* into the prompt and press **Enter**. This action causes ChatGPT to re-write the results of the original request in memo format, as shown in **Figure 12**.

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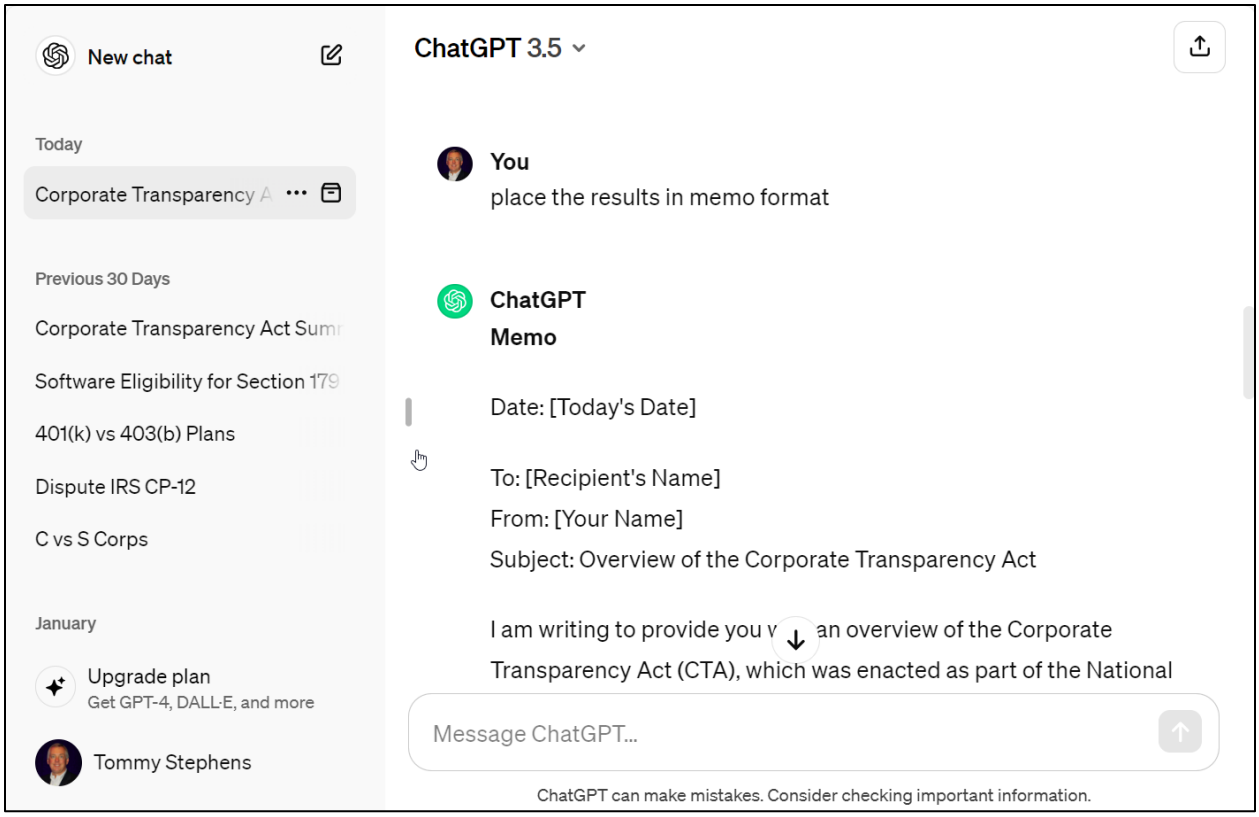

Figure 12 - Modifying A Prompt To Convert Output To Memo Format

Additionally, suppose you decide that the recently created memo does not provide sufficient details for you or your client. To have ChatGPT create a "deep dive" of the Corporate Transparency Act in memo format, enter the phrase *more details* and the service will modify the previous output by adding more information, as shown in **Figure 13**.

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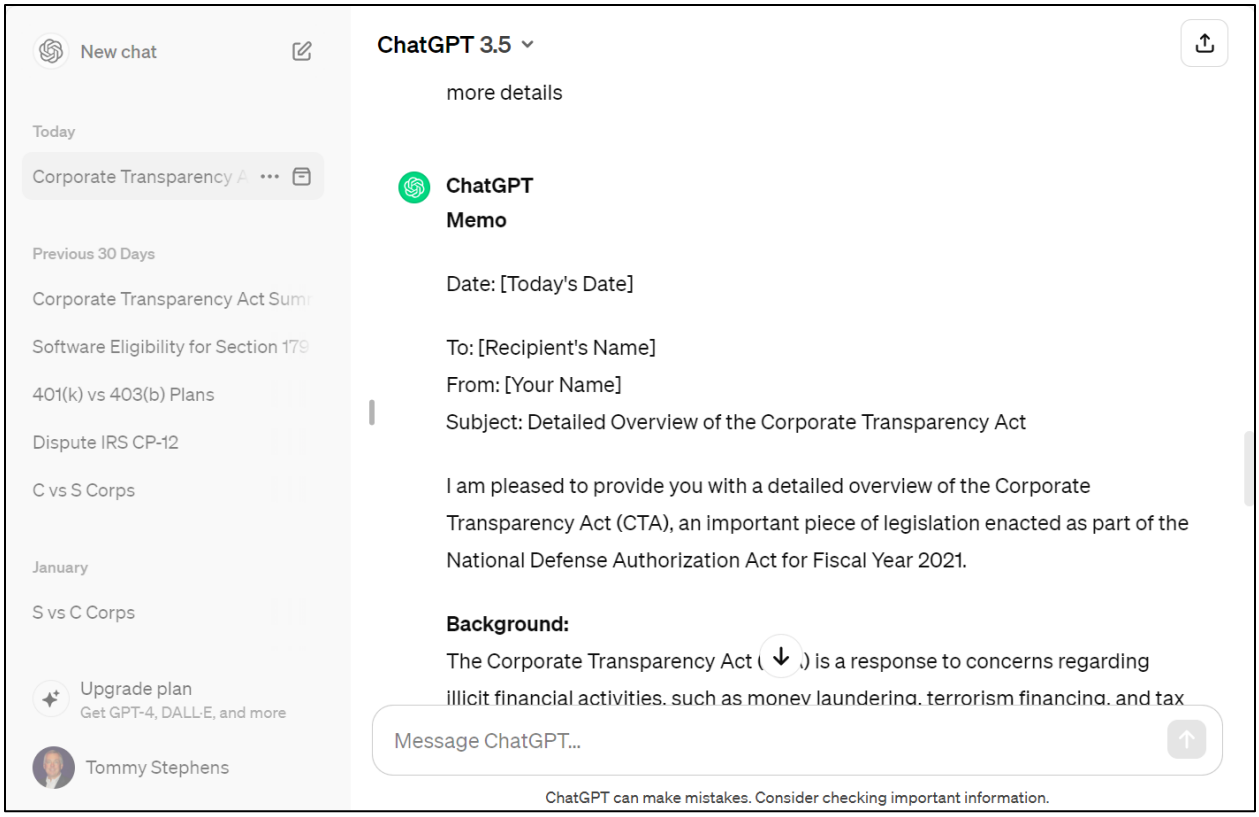

Figure 13 - Adding More Details To A Prompt's Response

Using the iterative process outlined above, you can modify your original request with prompts until you get a response that satisfies your specific needs.

Training ChatGPT To Use Your Writing Style

One of the essential tips for success when using ChatGPT is to "teach" the platform your writing style. Once you complete this task, ChatGPT will mimic your style when responding to subsequent prompts.

To illustrate, suppose you wanted to write a blog post on the impact of the Corporate Transparency Act (CTA). To complete the task, you could prompt ChatGPT with "*write a five hundred word summary on the Corporate Transparency Act.*" Upon issuing that prompt or something similar, you will receive a response like the excerpt below in **Figure 14**.

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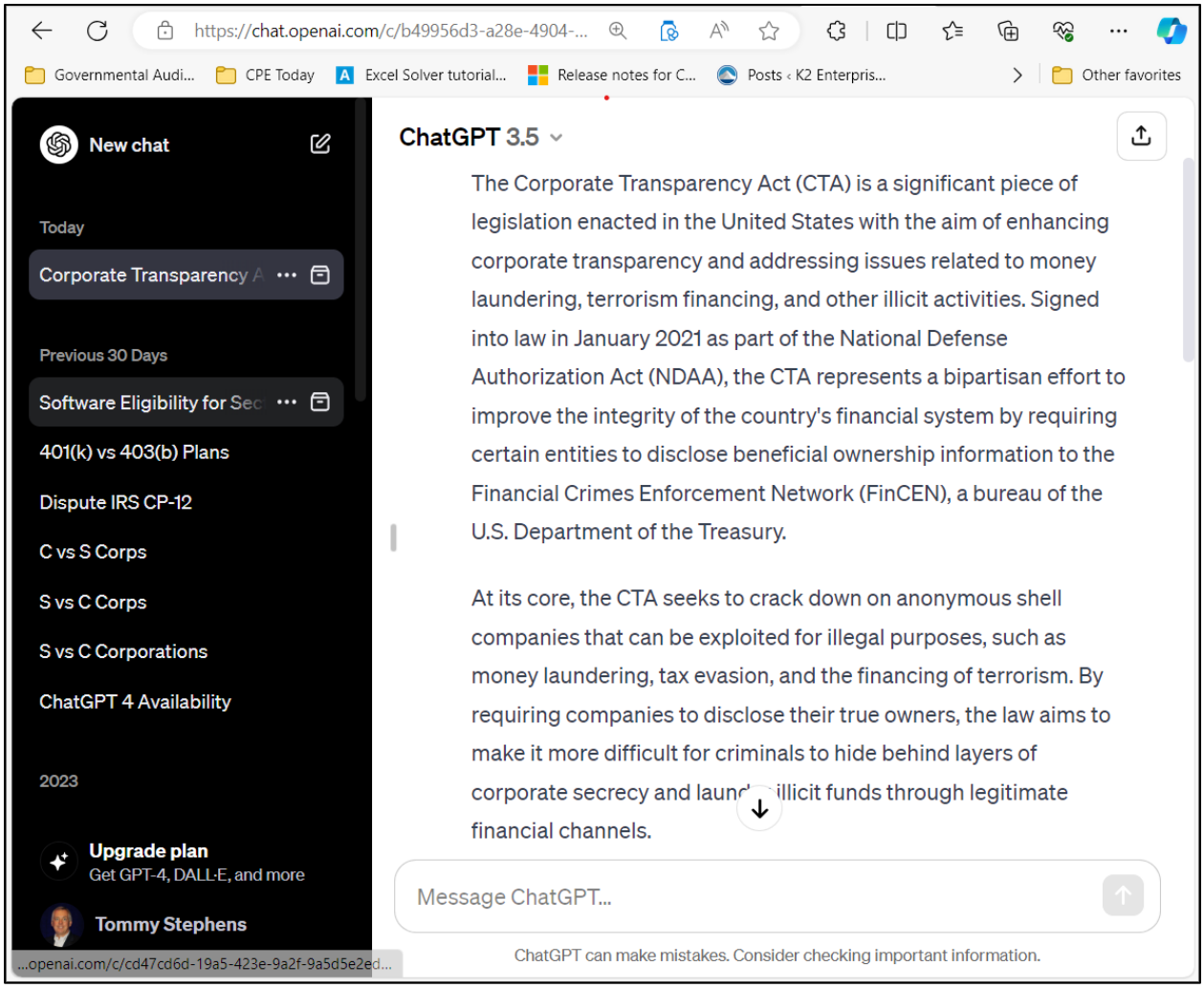

Figure 14 - Excerpt of Summary Of The Corporate Transparency Act

While the non-customized content ChatGPT generated is quite good, it is somewhat "generic" and does not reflect your writing style. Therefore, to customize the content, issue the following prompt:

> **Please learn my writing style from the following content**: *Many definitions of AI exist, and it's likely that no single AI definition fully encompasses all aspects of AI. For purposes of this class, we will define AI as using technology to mimic human behavior for the purposes of completing tasks otherwise performed by humans. This definition means that AI tools must be able to understand and respond to requests, engage in reasoning, learn from prior experiences, and make decisions based on inputs provided.*
>
> *Most who study this field subdivide AI into two categories: narrow AI and general AI. As implied by its name, narrow AI is used for focused, specific tasks. On the other hand, general AI is much broader and can include characteristics such as creativity, planning,*

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and reasoning. While narrow AI is very much available today, general AI is a bit more elusive and very few, if any, general AI tools are in use today.

To illustrate, let's consider a very simple example of narrow AI – junk mail filtering. When you receive an email from someone from whom you no longer want to receive emails, you might choose to block that sender in your email client or service. Upon blocking that sender, your technology "learns" that you no longer want to receive messages from that sender. In turn, it blocks all future emails from that sender.

You can repeat this process multiple times in the same thread to provide ChatGPT with a more thorough example of your writing style.

Once satisfied that you have trained ChatGPT sufficiently, you are ready to issue the prompt to write a five-hundred-word summary on the Corporate Transparency Act. **Figure 15** below illustrates the new response incorporating your requested writing style.

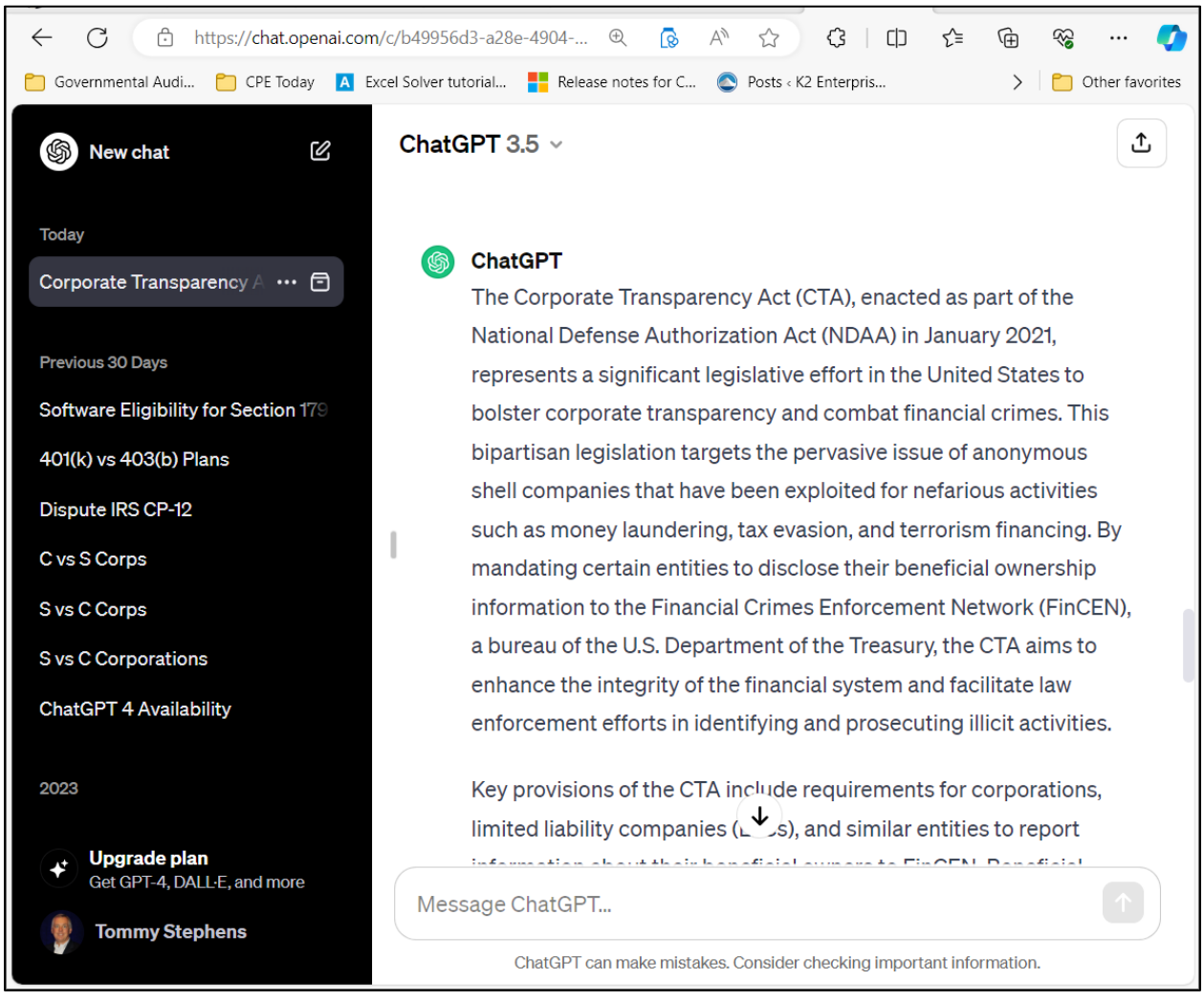

Figure 15 - ChatGPT Generated Content Using The Author's Requested Writing Style

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Note that the requested style does not need to be yours. For instance, perhaps you want to use the "voice" of Winston Churchill. In that case, enter a prompt *such as create a 500 word summary of the corporate transparency act in the voice of Winston Churchill,* and the tool responds with text such as that illustrated in **Figure 16**.

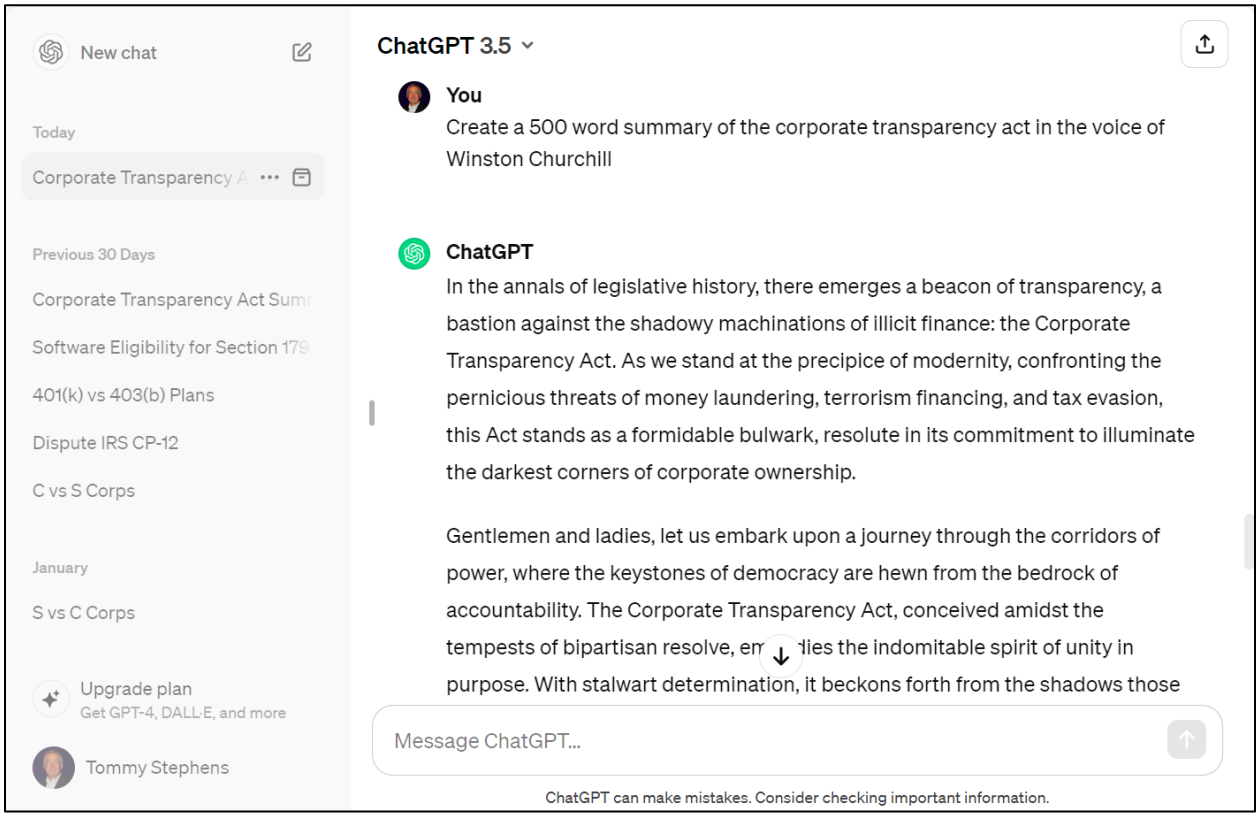

Figure 16 - ChatGPT Response In Another Author's Voice

Getting Started With Gemini

Using Google's Gemini service (formerly known as Bard) does not require a separate account. Instead, you can visit https://gemini.google.com/app and sign in using your existing personal Google account. Of course, if you do not have a Google account, you must establish one. Further, if you use Google Workspace and your administrator enables access to Gemini, you can also use your Workspace account to access the service.

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Like ChatGPT, Gemini offers free and paid subscriptions. The monthly fee for the paid model – **Gemini Advanced** – is $19.99. The paid offering provides access to the following features:

- Access to the Ultra 1.0 model,
- Better performance,
- Accessibility through a browser or an app,
- Can complete more complex tasks, and
- Integration into Gmail, Docs, and other Google services.

Google indicates that the Ultra 1.0 model offers better performance and accuracy than competing models and is even more accurate than humans in areas such as math, physics, history, law, medicine, and ethics.[1]

Fundamental Queries Using Gemini

The process to initiate queries in Gemini mirrors the one used to initiate queries in ChatGPT. In short, you enter your prompts into the Gemini user interface and receive a response from the platform. Then, you can modify your requests repeatedly until you receive the information you seek in the desired format. For purposes of facilitating comparisons between Gemini and ChatGPT, we will use the same prompts in this session as those used in the discussion of ChatGPT. This methodology should allow for meaningful comparison between the two platforms.

Our first query using Gemini uses the prompt to provide an overview of the Corporate Transparency Act. Using that prompt in Gemini generates the response pictured in **Figure 17**. Notably, the content of the Gemini-generated result is similar – but not identical – to the response created by ChatGPT and pictured in Figure 11. The (hopefully) apparent reason for the differences is that these two platforms use different LLMs. Therefore, we should not expect that the responses should be identical. Further, if substantial differences exist between the two responses, we would likely need to delve into the matter to identify whether factual issues were associated with the replies.

[1] https://blog.google/technology/ai/google-gemini-ai/#performance

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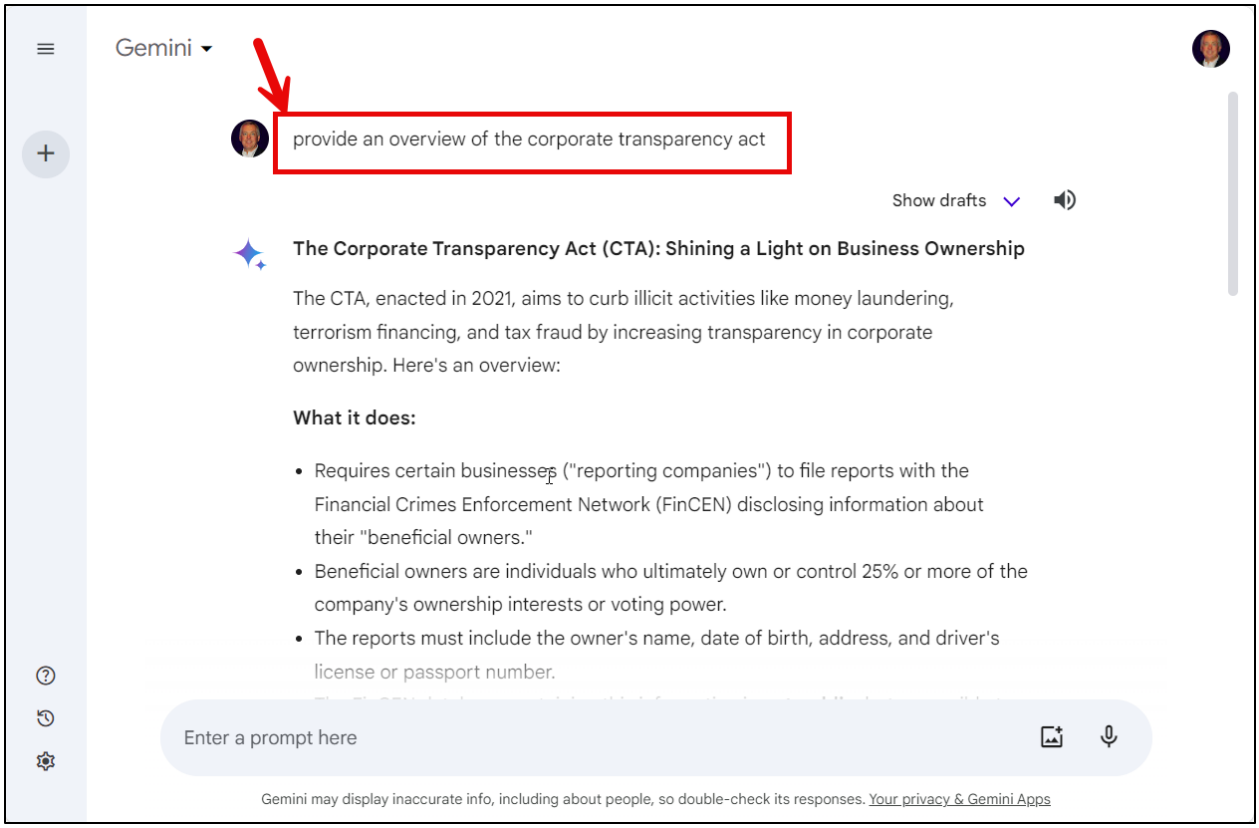

Figure 17 - Initial Response to A Prompt In Gemini

Next, modifying the prompt with the phrase place the results in memo format causes Gemini to update the output to that pictured in **Figure 18**.

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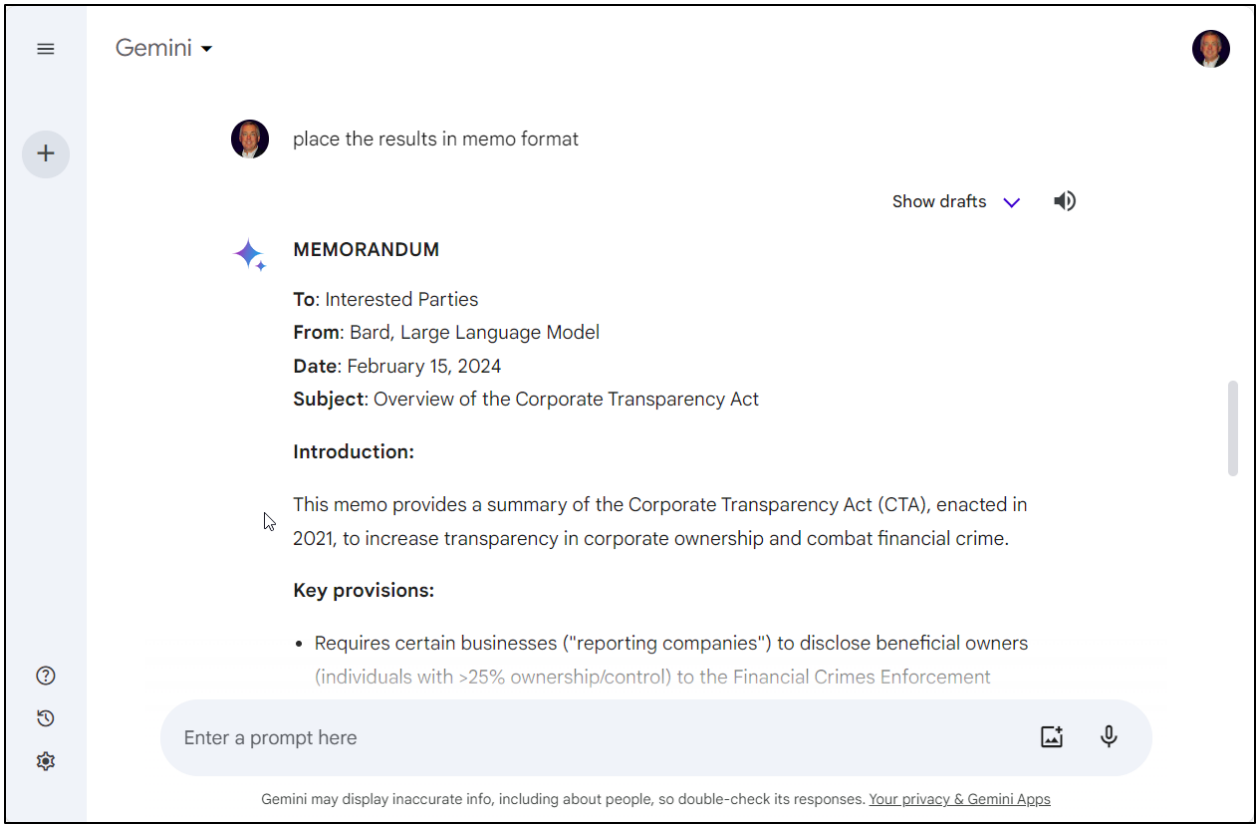

Figure 18 – Results Of The Gemini Prompt Modified To Reformat The Output Into A Memo

Next, adding the phrase *more details* to the prompt causes Gemini to provide the results pictured in **Figure 19**.

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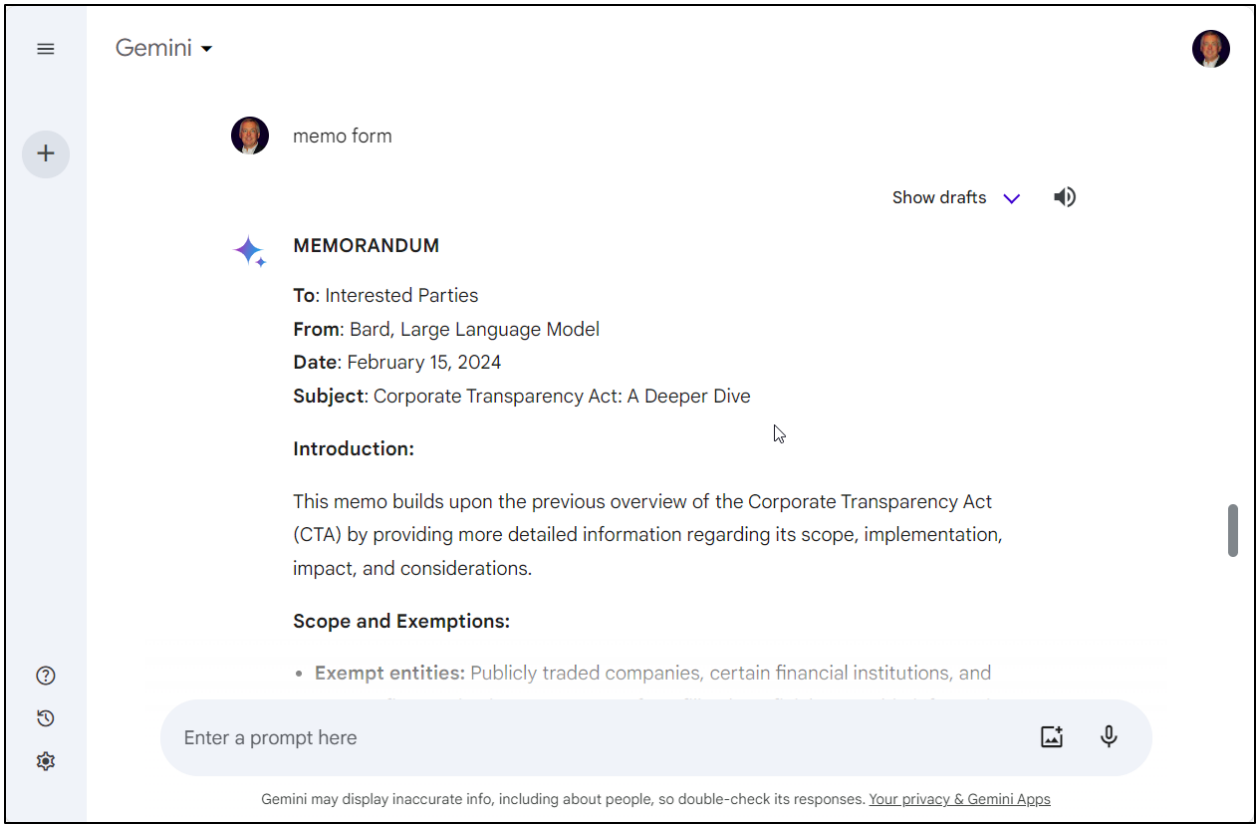

Figure 19 - Detailed Prompt Results In Memo Form

Gemini Offers Three Versions Of Responses By Default

So far, you've seen that ChatGPT's and Gemini's responses are similar when presented with the same prompts. However, there is a significant difference between the two platforms that many users may not recognize immediately. Specifically, Gemini provides three responses to each prompt. As shown in **Figure 20**, clicking **Show Drafts** allows you to access three drafts of the reply to the initial prompt. The draft on the left contains the least details, the one in the middle provides moderate details, and the draft on the right contains the most details. Of course, you can choose the one you prefer to use.

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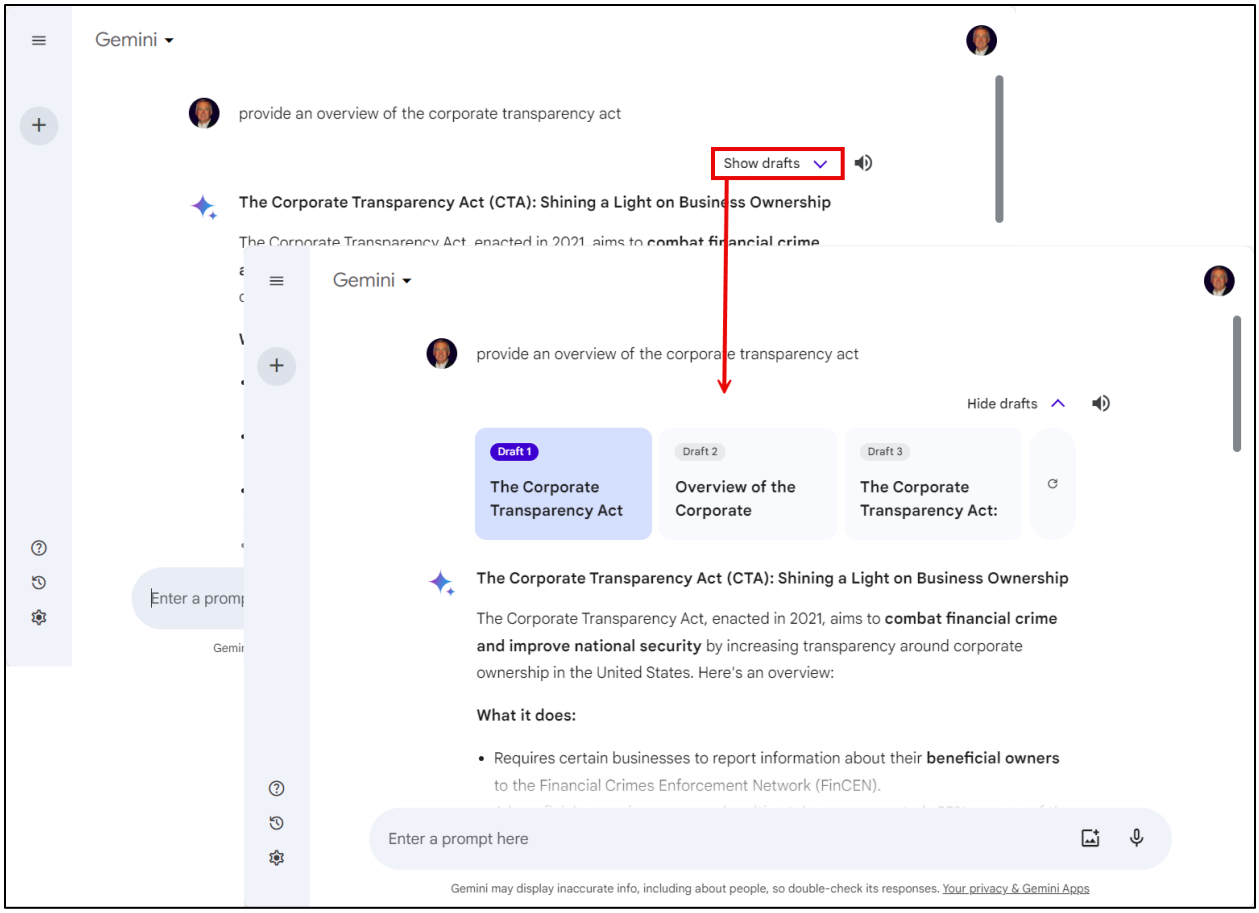

Figure 20 - Accessing The Three Responses Prepared By Gemini In Response To A Prompt

Like ChatGPT, you can prompt Gemini to use another “voice” for the response. In the example pictured in **Figure 21**, we can see how Gemini predicts Mick Jagger would summarize the Corporate Transparency Act!

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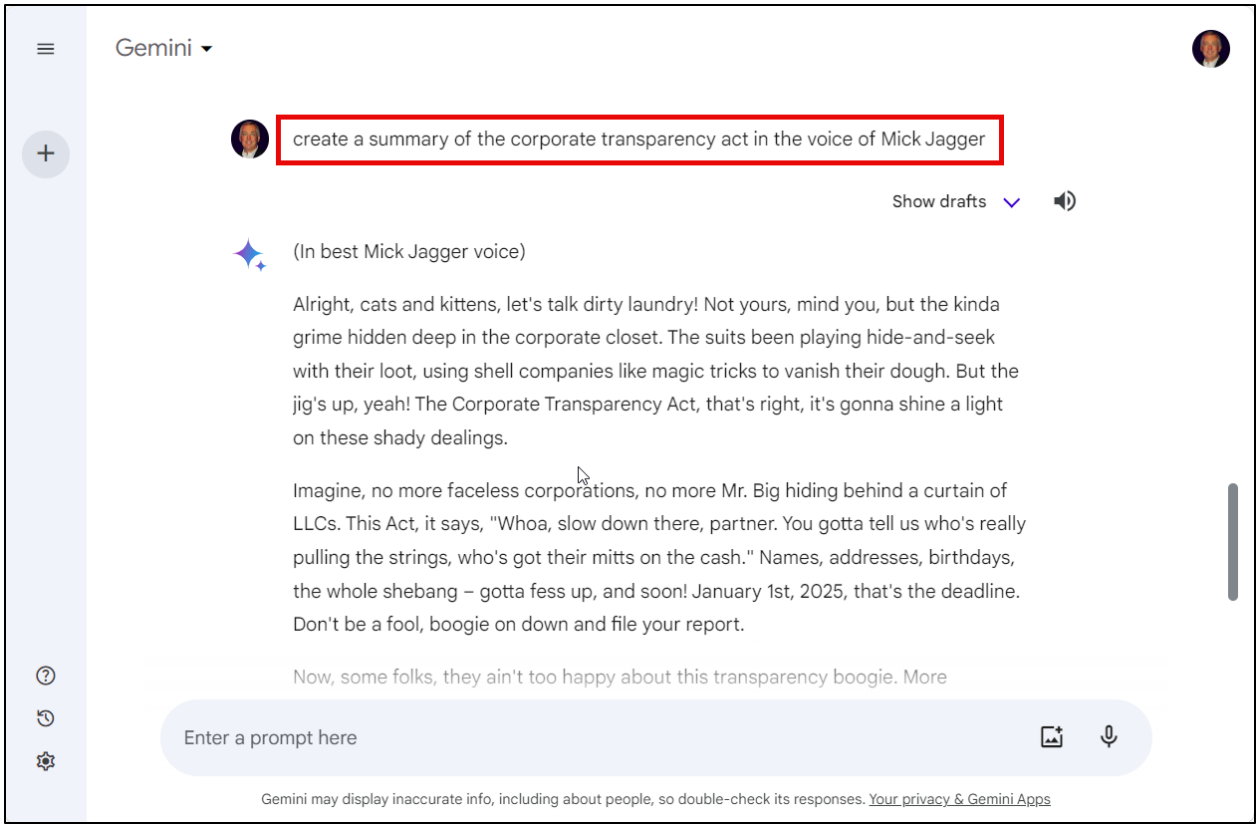

Figure 21 – Gemini's Response In Another Author's Voice

?	In what ways is Gemini like ChatGPT? How does it differ? Which of these two platforms might better suit you and your team?

Helpful Tips To Use ChatGPT And Gemini More Effectively

As you've seen, using ChatGPT and Gemini to generate answers to your questions and requests can be extremely simple. Further, even the most straightforward prompts can contain tremendous power. However, to utilize the tool even more effectively, you'll want to pay attention to the following tips on using generative AI tools more effectively.

1. **Be curious**! Don't be afraid to try new – perhaps even off-the-wall – things with your generative AI tools. For example, ask a generative AI tool to write a song for you, prepare a speech you must deliver, or provide a recipe for an entrée you would like to have for dinner. You are limited only by your imagination.

2. **Use specific prompts**. Verbs such as *list*, *define*, *cite*, *generate*, *differentiate*, and *explain* are unambiguous and will typically produce better results than prompts that contain vague language.

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3. As with your prompts, **be specific about the content you seek**. For instance, if you're interested in retirement plans for self-employed persons, a prompt such as *what types of retirement plans are available to self-employed persons* will generate a more meaningful set of results than a prompt such as *what types of retirement plans are available*. The more keywords you can add to your prompt, the better your results will be.

4. **Recognize the limitations of generative AI tools**. Today's AI tools are incapable of thinking but are very good at stringing together words based on the trained data in their LLMs. Generative AI tools that use outdated datasets will likely not provide as meaningful results as up-to-date resources. Likewise, generative AI tools that rely on LLMs with only a moderate amount of training or outdated data will generally produce inferior results compared to those trained extensively.

5. **Review your results before you publish them**. Again, generative AI has limitations and will make mistakes. Ensure that you (or someone on your team) review the results of your AI-generated prompts before you publish or otherwise release them.

?	How might you use ChatGPT and Gemini's generative capabilities to save time in your daily activities?

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Using Microsoft's Copilot Platform

Chapter 3

As one of the world's largest technology service providers, Microsoft is also a significant player in generative AI. The company's **Copilot** platform provides several exciting options in paid and free environments. This chapter explores Copilot, including its various offerings and how to use its services.

Learning Objectives

Upon completing this chapter, you should be able to:

- Differentiate between Copilot's subscription offerings;
- List similarities and differences between Copilot's no-charge offerings and similar free offerings from ChatGPT and Google; and
- Identify key differences between Copilot's paid subscription models and the free services.

What Is Copilot?

Microsoft's Copilot AI platform is probably best described as a collection of services instead of a single platform. In many respects, the free version of Copilot closely resembles similar services available from ChatGPT and Google. However, other aspects of the service differ significantly from competitive platforms. Additionally, Copilot's paid subscription is strikingly different from the paid plans offered by ChatGPT and Google. This section identifies the similarities and differences between Copilot and other platforms.

How To Access Copilot's Free Offerings

Like the free offerings from ChatGPT and Google, many will be intrigued by the free offerings from Copilot. In fact, most will find accessing Copilot's free services even easier than accessing competitive offerings from ChatGPT and Google. This ease of access occurs because Microsoft does not require establishing an account before using Copilot. Notably, the free version of Copilot provides access to OpenAI's GPT-4, a relatively new and updated dataset. In contrast, the free version of ChatGPT provides access to GPT-3.5, whose last knowledge update occurred in September 2021.

One way of accessing Copilot is through Windows. Using Windows 11, you can access Copilot directly from the Taskbar. More specifically, you can customize your Taskbar to include a shortcut to Copilot. To do so, first, ensure you have the most recent update to Windows 11. Then, as

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shown in **Figure 22**, choose **Personalization and Taskbar**. Finally, toggle Copilot "on." Upon doing so, you can access the service directly from the Taskbar. If you do not see an option for enabling Copilot, ensure you have the latest update on your Windows 11-powered device.

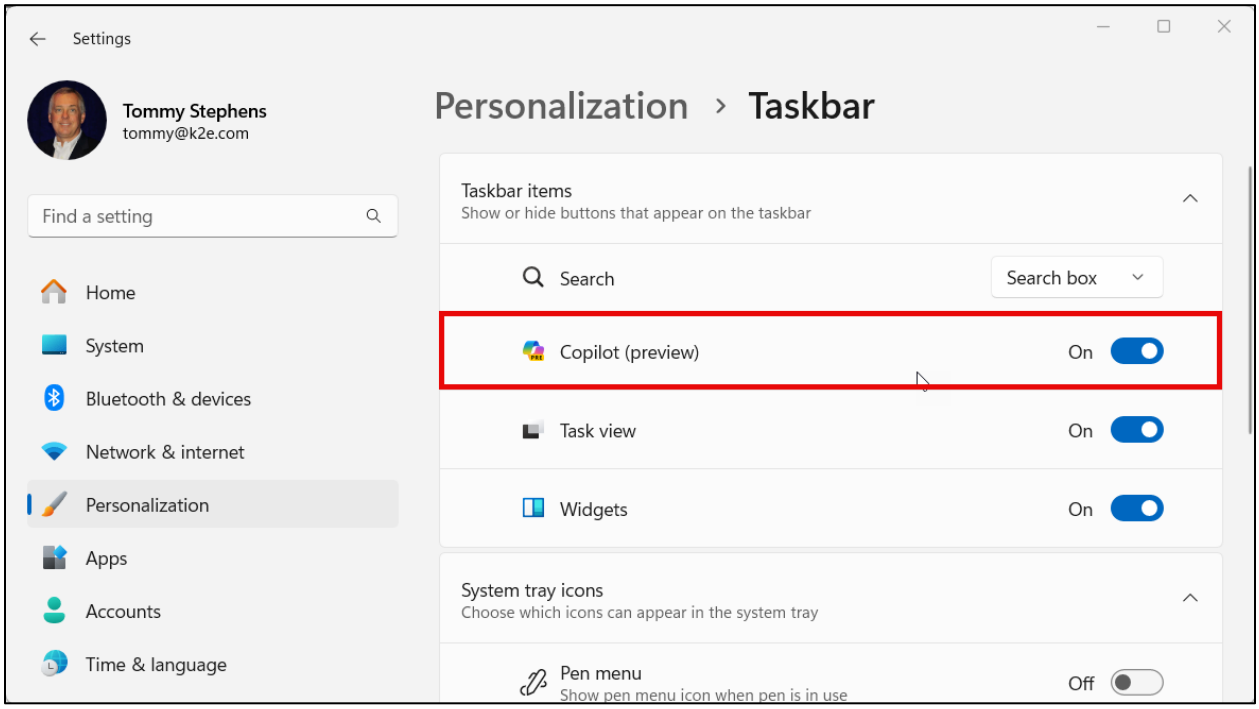

Figure 22 - Customizing Windows Taskbar To Add Access To Copilot

If you run Windows 10, adding Copilot to the Taskbar is slightly more involved. You can use the instructions provided at https://k2e.fyi/windows10copilot to add the icon to the Taskbar in Windows 10.

Accessing Copilot Through Microsoft's Edge Browser

Although accessing Copilot from a Taskbar icon might be preferable for some users, accessing the service from a browser is an easier option for others. Specifically, if you have Microsoft's **Edge** browser installed, the free version of Copilot is already available to you. In that instance, you can gain access by clicking the Copilot icon inside Edge's **Search** box, as shown in **Figure 23**.

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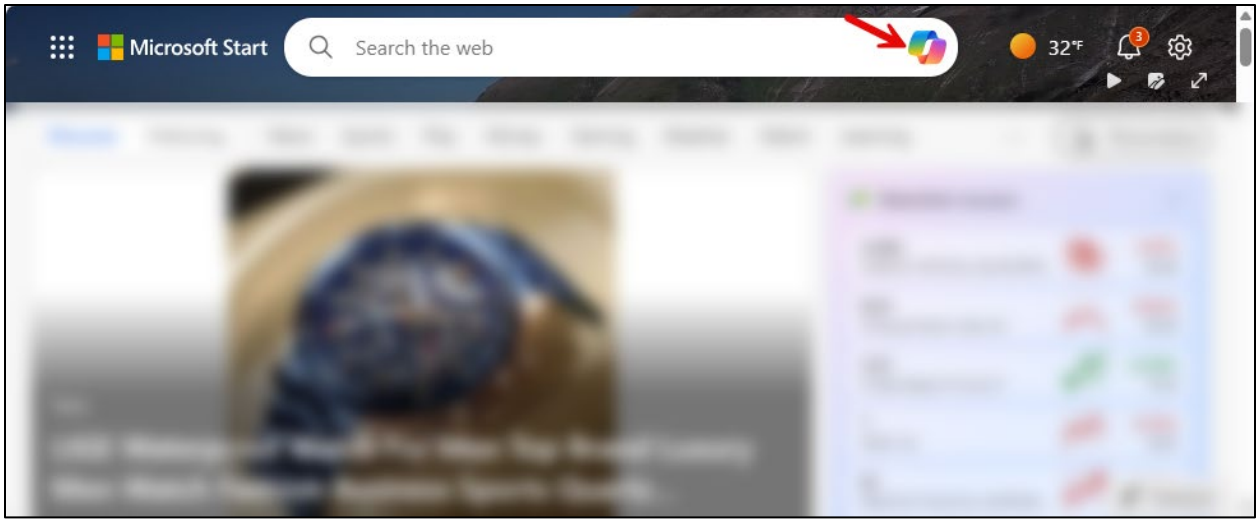

Figure 23 - Accessing Copilot Directly From The Edge Browser

Upon doing so, you will have access to Copilot's generative AI capabilities, as shown in **Figure 24**. Here, you can enter prompts of up to 4,000 characters to help you find the information you seek or generate content.

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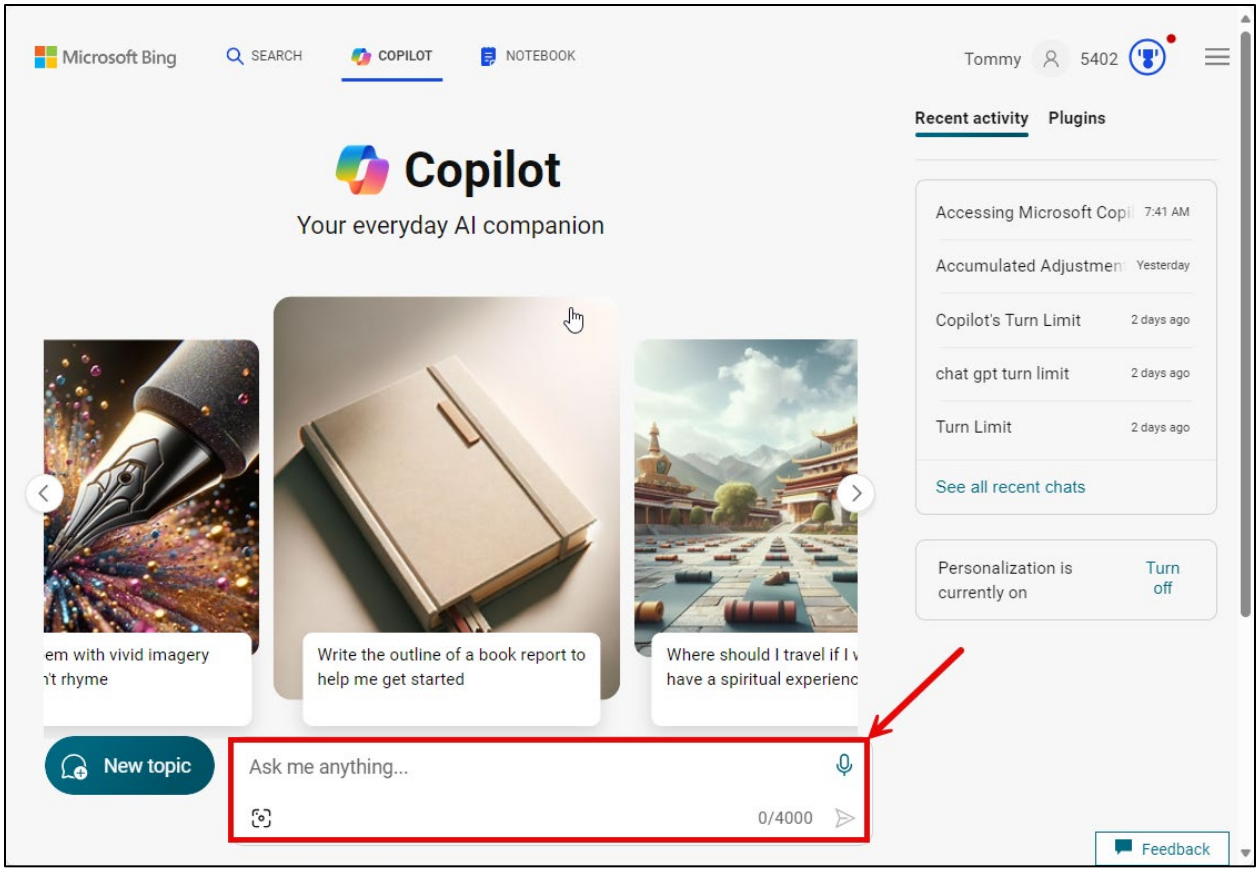

Figure 24 - Accessing Copilot's Chat Feature

A third option for accessing Copilot also uses the Edge browser. You can click the **Copilot** option near the upper right corner of the browser window to access the service. **Figure 25** illustrates accessing Edge using this technique.

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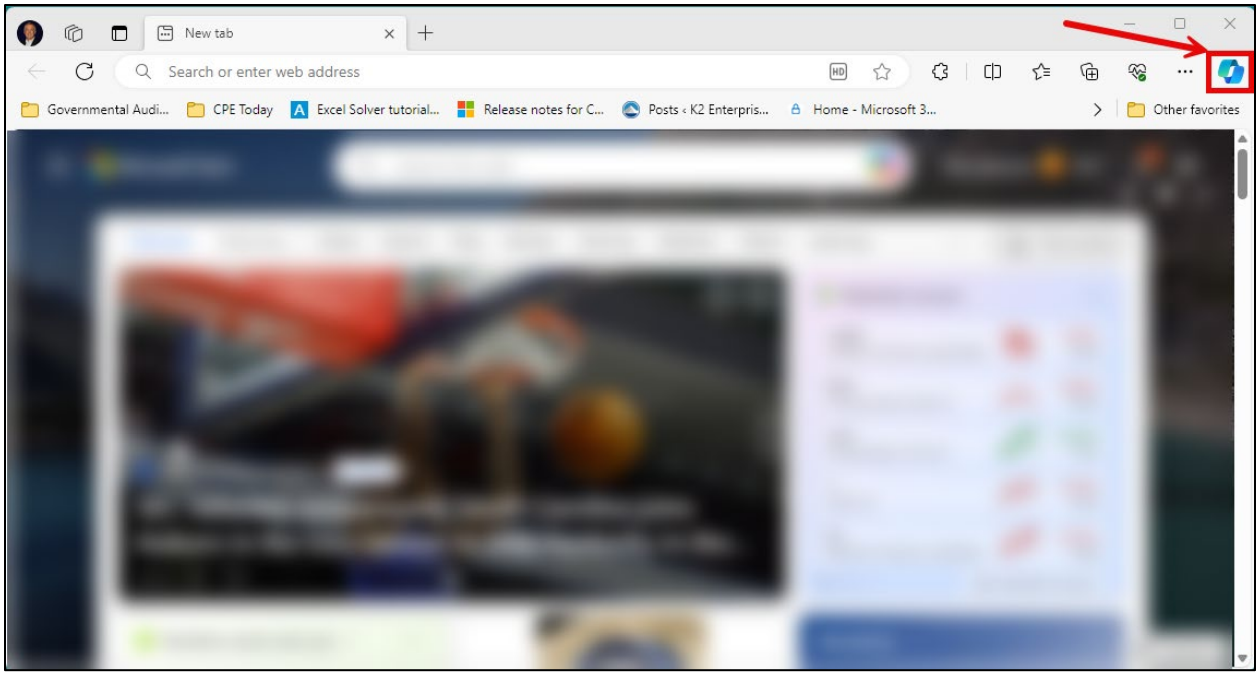

Figure 25 - Accessing Microsoft Copilot From the Edge Browser

Regardless of the method you use to access the free Copilot service, you can enter prompts to have Copilot generate the content you need. For example, if you access Copilot by clicking on an icon on the Windows Taskbar, Copilot opens in a pane on the right side of your screen, as shown in **Figure 26**.

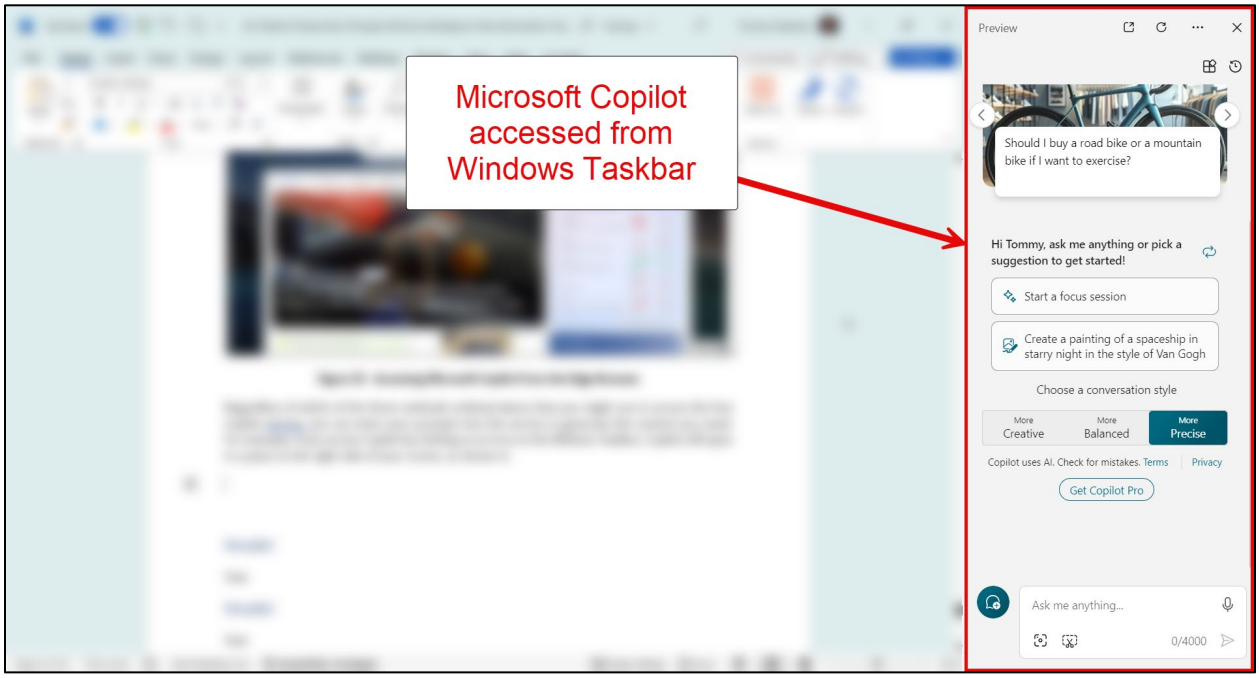

Figure 26 - Accessing Copilot From The Windows Taskbar

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Once you access the service, you can enter your prompt into the box near the lower right corner of the Copilot pane, as shown in **Figure 27**.

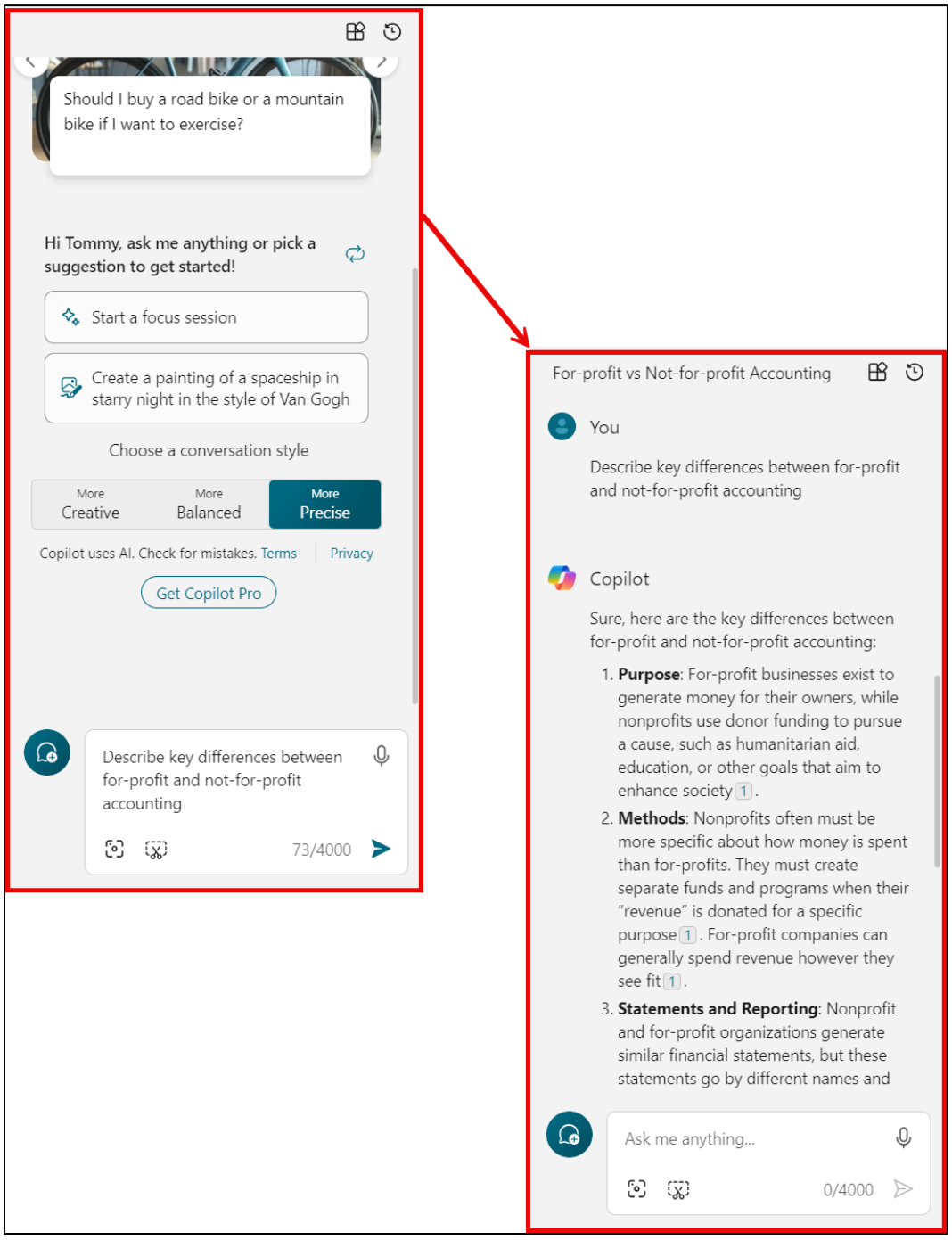

Figure 27 – Sample Response Generated By Copilot

One standard feature Copilot provides is three options for the style of responses it generates. Specifically, when you prompt Copilot, you can choose between **More Creative**, **More Balanced**, and **More Precise** answers. **Figure 28** illustrates this feature.

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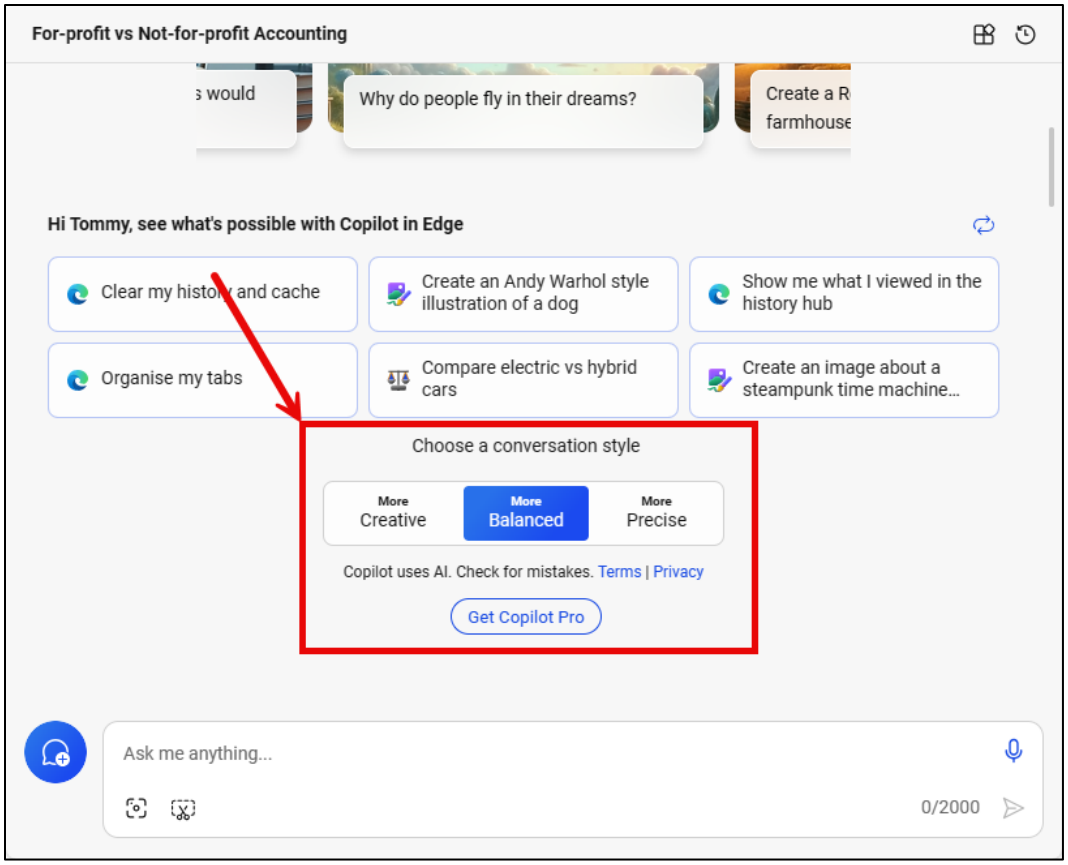

Figure 28 - Choosing Between Conversation Styles In Copilot

Key Features In Paid Copilot Subscriptions

As indicated above, Microsoft provides three options for accessing Copilot at no charge. However, if you have a qualifying Microsoft 365 subscription, you can choose a paid version of Copilot – Copilot Pro – for even more power and productivity.[2] If you subscribe to Copilot Pro, the cost is $30 per user per month for business users. On the other hand, if you use Microsoft 365 Personal or Family and want to use Copilot Pro in Microsoft 365 apps, the cost is $20 per user per month.

In addition to the tools available in the free Copilot service, access to a Copilot Pro subscription offers the following features.

- Copilot Pro users with paid subscriptions will likely see faster performance and quicker responses because Microsoft prioritizes access to GPT-4 and GPT-4 Turbo.

[2] To access a paid Copilot Pro subscription in business environments, you must have one of the following Microsoft 365 subscriptions: Microsoft 365 Business Standard, Microsoft 365 Premium, Microsoft 365 E3, Microsoft 365 E5, Office 365 E3, or Office 365 E5.

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- Copilot Pro integrates deeply with Excel, Word, Outlook, and PowerPoint. For instance, you can use Copilot Pro to generate a PowerPoint presentation from an existing Word document.

- You can use Copilot Pro to generate images. You can create pictures and, if necessary, edit and resize them using the **Designer** tool.

- Soon, Microsoft will make available a new feature that allows you to create GPTs for specialized applications.

Copilot Pro's Integration With Microsoft Office Applications

As indicated above, one of the most significant benefits of Copilot Pro is its integration with Microsoft Office applications. For example, you can access the service directly from within Microsoft Office applications with a Copilot Pro subscription. For instance, when working in Word, you will see the Copilot icon near the window's left side. Clicking that icon opens Copilot Pro from within the application, as shown in **Figure 29**.

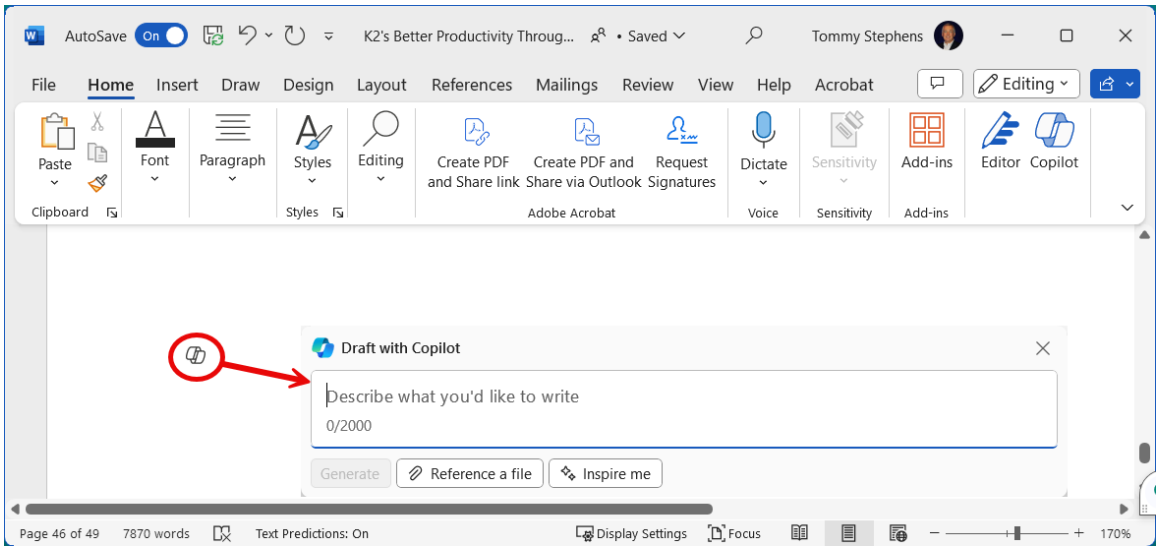

Figure 29 - Accessing Copilot In Microsoft Office Word

You can also access Copilot Pro from within Office applications by clicking the **Copilot** icon on the Ribbon's **Home tab**, as shown in **Figure 30**. In this example, clicking the icon opened the Copilot Pro pane inside PowerPoint. You would receive similar results if you clicked the Copilot icon from the Ribbon in other Office applications, such as Excel, Word, or Outlook.

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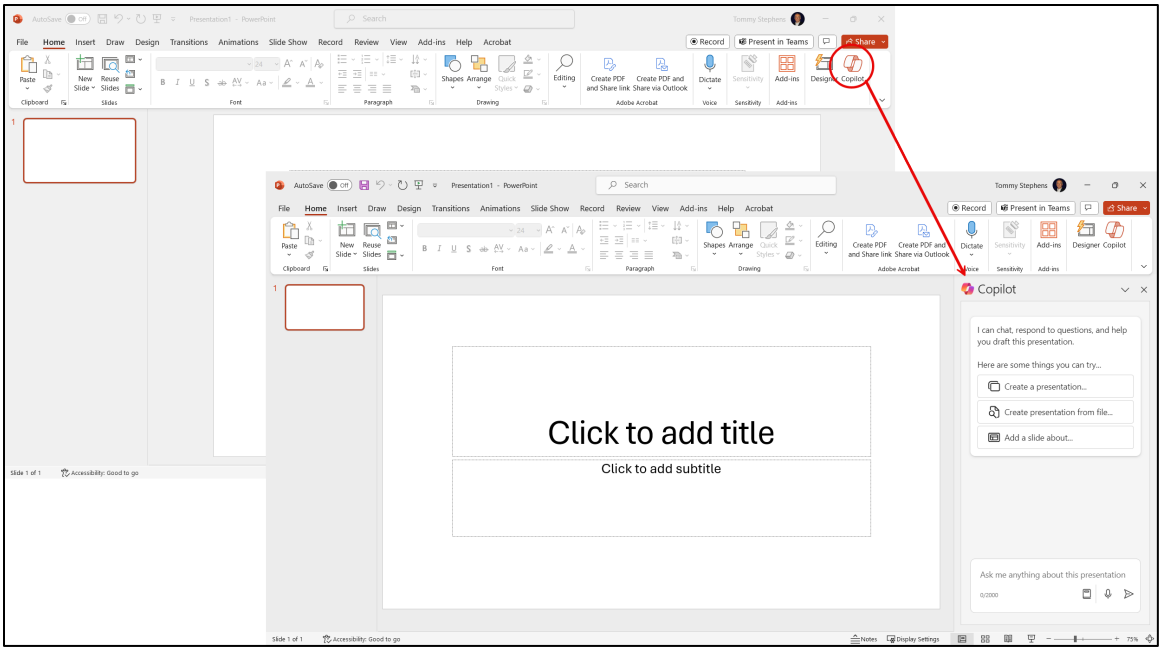

Figure 30 - Accessing Copilot Functionality From The Ribbon Of Microsoft Office Applications

According to Microsoft, the following integrations are available between Copilot Pro and Microsoft 365 applications.

- **Excel**: You can use Copilot Pro to assist with data analysis. For instance, you can ask Copilot to "generate a formula to calculate the average sales" or "analyze and summarize this data."

- **Word**: Copilot Pro can help you summarize a document, create a draft, and polish a document's existing text. For example, you can ask Copilot to "summarize this document" or "re-write this paragraph in a more formal tone."

- **PowerPoint**: You can use Copilot Pro to create presentation slides. You might ask Copilot to "create an outline for a presentation on climate change" or "design slides for a project update."

- **Outlook**: Copilot Pro can help you draft emails. You could ask Copilot to "draft an email to my team about the upcoming meeting" or "summarize this long email thread."

- **Teams**: Copilot Pro can recap meetings and find information. For example, you can ask Copilot to "recap the last team meeting" or "find the project deadline mentioned in the chat."

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- **OneDrive**: Copilot Pro can help you ask questions and get information from files. For instance, you can prompt Copilot to “find the sales report from last quarter” or “extract key points from this report.”

To illustrate, consider Copilot Pro’s ability to create a PowerPoint presentation from an existing Word document. In this example, the user prompted Copilot Pro to *Create presentation from file K2’s Better Productivity Through Artificial Intelligence And Automation Tools (DRAFT).docx*, as shown in **Figure 31**.

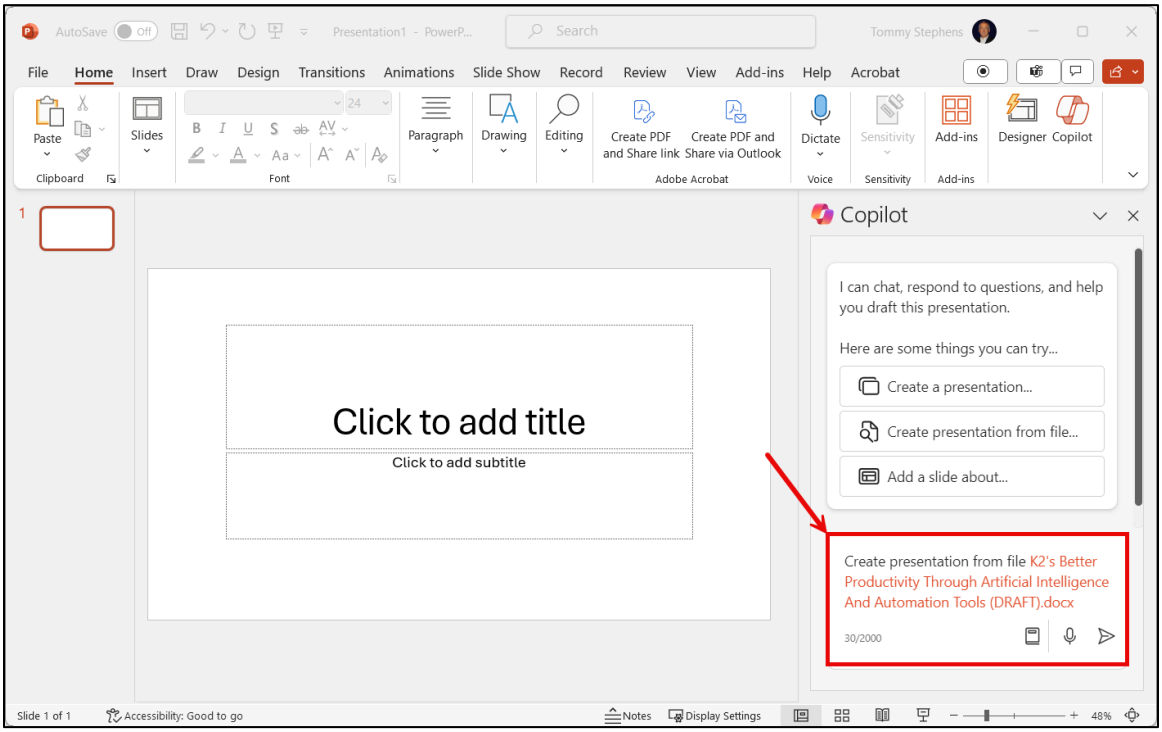

Figure 31 - Prompting Copilot Pro To Create A PowerPoint Presentation From An Existing Word Document

Upon issuing the prompt, Copilot Pro analyzed the data in the Word document and generated a 42-slide presentation, a portion of which **Figure 32** illustrates. Notably, although Copilot Pro created the PowerPoint document, no restrictions exist with the slides. Users can – and perhaps should – edit the presentation for content and style to suit their needs and tastes.

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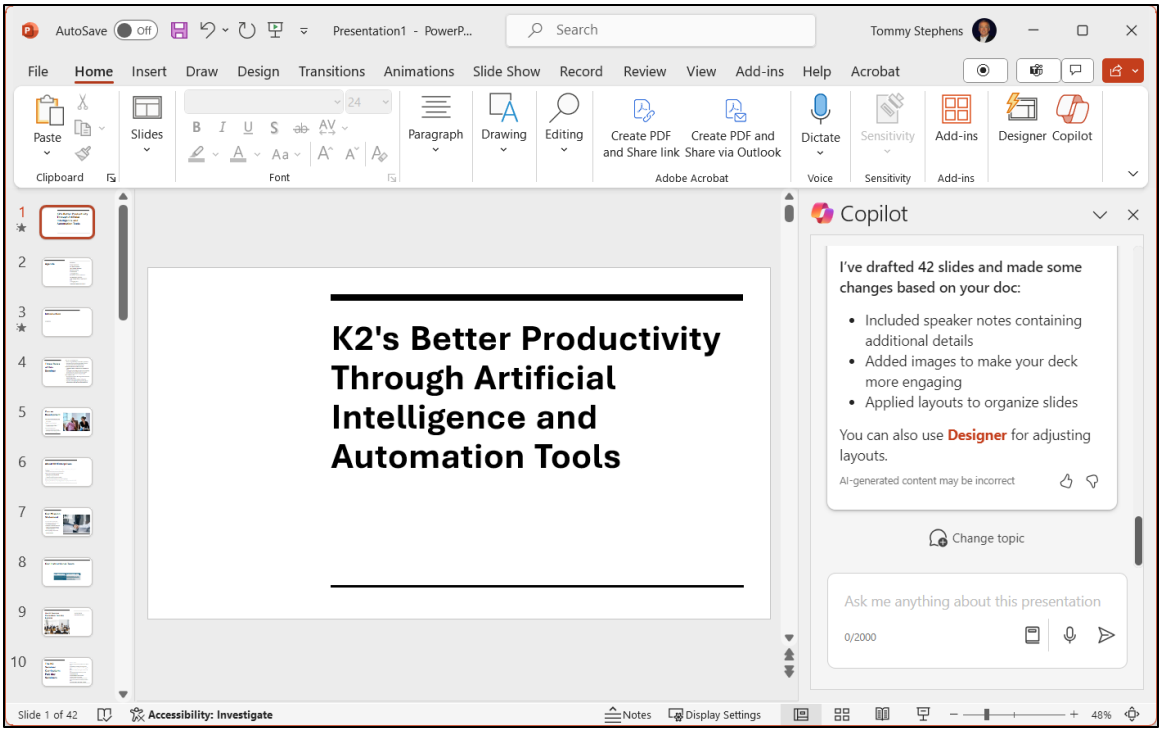

Figure 32 - Draft Of AI-Generated PowerPoint Presentation

The level of deep integration between Copilot Pro and Microsoft 365 applications will likely cause many to opt for this paid subscription model.

?	If you subscribe to Microsoft 365 applications, what are some ways you might consider using Copilot Pro to automate and streamline everyday tasks?

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AI Risks, Concerns, And Considerations

Chapter 4

So far, we've painted a pretty picture of AI. And to be sure, today's AI tools – which will only continue to improve – provide tremendous productivity-enhancing options. Yet, risks and concerns associated with AI exist, and we should not ignore them. This chapter explores some of these risks, concerns, and other considerations.

Learning Objectives

Upon completing this chapter, you should be able to:

- List examples of AI-specific risks and how they could materialize;
- Cite examples of potential ethics issues surrounding AI;
- Identify examples of AI tools not previously mentioned in this course and indicate their primary use cases.

Six Risks Associated With AI

As demonstrated in this course, the opportunities to use AI as a productivity-enhancing tool are seemingly endless. Yet, AI is not perfect. Further, AI users are imperfect, too, and the potential combination of imperfect technology and human failures can create serious risks. Among the most concerning of these risks are the following six.

- Biased Outputs
- Copyright Infringement
- Data Privacy Concerns
- Data Security Issues
- Deepfakes
- Hallucinations

Biased Outputs

For many, one of the most concerning issues is bias in the results generated by our AI tools. LLMs that lack sufficient training, do not possess enough data, or use a dataset not representative of the population can generate incorrect or misleading results. In a Time magazine article entitled Artificial Intelligence Has A Problem With Gender And Racial Bias. Here's How To Solve It, the author, Joy Buolamwini, provided several examples of AI platforms failing to correctly identify notable persons like Oprah Winfrey, Michelle Obama, and Serena Williams. More specifically, according to the author, the data in LLM used by the facial recognition tool underrepresented

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women and people of color. Accordingly, the AI platform struggled to correctly identify women of color, as shown below in **Figure 33** and **Figure 34**.

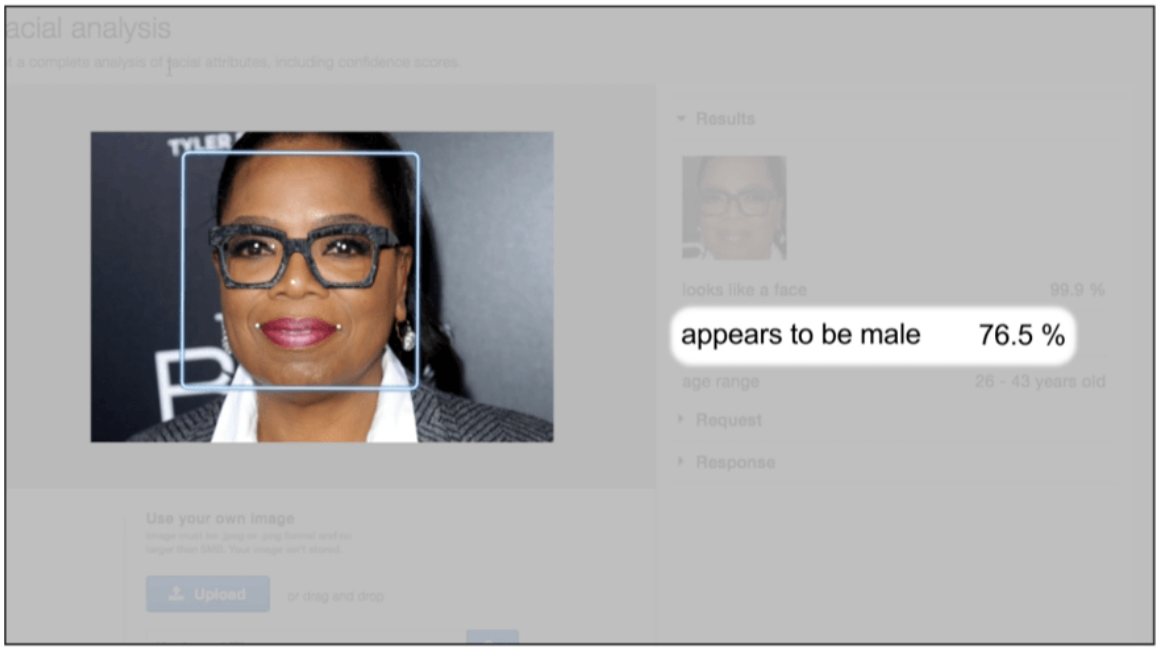

Figure 33 - AI Mis-Identifying Oprah Winfrey As Male

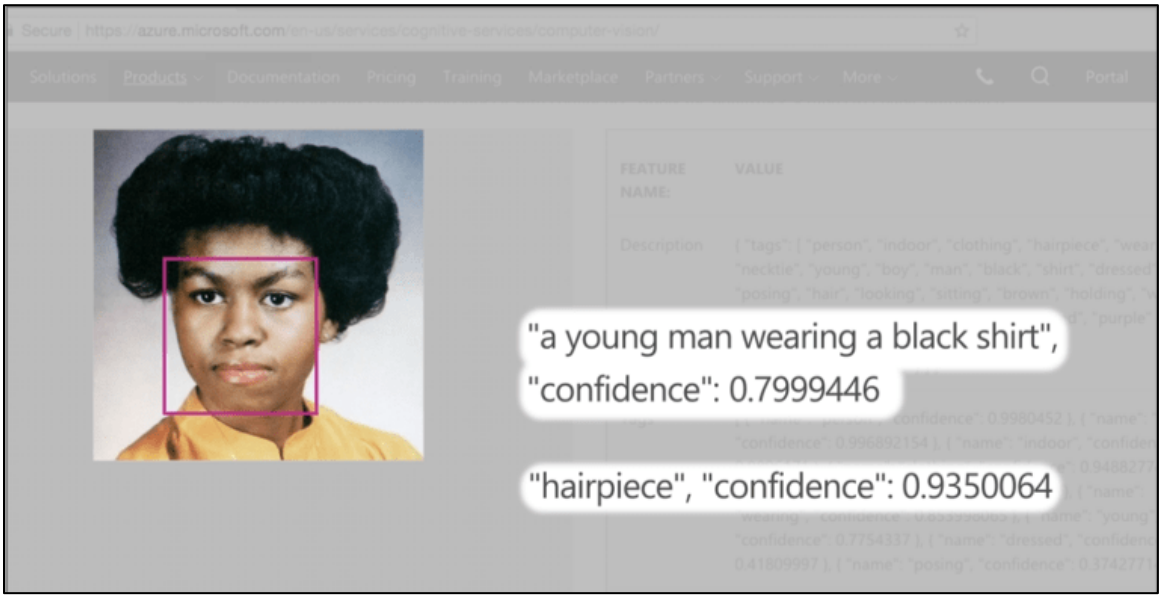

Figure 34 - AI Mis-Identifying Michelle Obama As Male

The two examples presented above clearly outline the absolute need for LLMs to be free from bias. To do that, those involved with constructing LLMs ***must*** ensure that the models contain adequate and appropriate data across all population sectors – whatever that population is.

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Failing to accomplish this goal will likely have severe repercussions regarding public acceptance of AI.

Copyright Infringement

Let's be realistic: technology has made it all too easy to cheat, especially when the issue is intellectual property theft. Using a search engine to find content on the Internet, copy that content from a web page, and paste it into a document without appropriate attribution is an activity that occurs far too many times every day. In these situations, the person engaging in the act is potentially stealing intellectual property created by someone else.

In the world of generative AI, potential copyright infringement issues will likely continue to be a source of debate for years to come. For example, the New York Times filed a lawsuit against Microsoft and Open AI in December 2023, alleging mass copyright infringement. The Times alleged that the defendants copied much of the article and "fed" it into the LLM used by ChatGPT without compensating the Times for the content. In the lawsuit, The Times stated:

> *These tools were built with and continue to use independent journalism and content that is only available because we and our peers reported, edited, and fact-checked it at high cost and with considerable expertise.*

Consider the following text generated by ChatGPT, responding to the prompt: *Who owns the copyright to materials generated by AI*? ChatGPT's response was *Generally, the entity or individual that creates the AI-generated content is considered the copyright owner. However, this may vary based on jurisdiction and specific contractual agreements.*

Now, consider Gemini's response to the same prompt: *In the United States, the Copyright Office has stated that it will not register works that were created by an autonomous AI tool. This means that, under current US law, AI-generated works are either in the public domain or they are derivative works of the materials that the AI was trained on.*

This issue will likely continue to increase without clear guidance from the legal system. Therefore, the current best practice for most professionals should be to proceed with caution and always provide appropriate attribution, even when it's unclear whether attribution is required.

Data Privacy

Data privacy is the right and ability of individuals to control how their personal information is collected, used, shared, and stored by various entities, including AI platforms. Although data privacy and data security are closely related, there are differences between these two fields, with data security closely tied to protecting the data maintained in an organization.

Because AI relies on large amounts of data to train the LLMs, it presents many challenges and risks for data privacy. Among these are collecting, processing, sharing, and retaining information

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about you, how you use your service providers' AI platforms, and what information your service provider stores about you and your prompts.

Privacy Policies

Potential users of AI platforms should carefully read and understand the privacy policies before using these platforms. You can access ChatGPT, Gemini, and Copilot's policies from the following locations.

- ChatGPT: https://openai.com/policies/privacy-policy
- Gemini: https://support.google.com/gemini/answer/13594961?hl=en#privacy_notice
- Copilot: https://learn.microsoft.com/en-us/security-copilot/privacy-data-security

Data Security

As indicated above, data security is closely related to data privacy. However, data security ensures that unauthorized individuals – inside and outside your AI provider – cannot access your personal information. In other words, although your AI provider may gather and use significant amounts of your personal information in compliance with their privacy policy, the AI provider's security policy should reduce the risk that unauthorized individuals access any of your data. At the individual level, end-users have very little, if any, control over data security. Stated differently, if you begin using an AI tool, you likely will not be able to mandate that your AI service provider follows your preferred data security procedures.

Deepfakes

According to Microsoft, a deepfake is a synthetic media that uses artificial intelligence to manipulate or generate audio, video, text, or images. A deepfake can create realistic impersonations of real people or events, such as making someone say or do something they never did or altering their appearance or voice. Individuals can use deepfakes for entertainment, education, art, or journalism, but they can also threaten privacy, security, democracy, and human rights. Because AI-generated deepfakes can appear to be authentic images or videos, they can prove disastrous to the party they impersonate.

One widely reported deepfake victimized Canadian Prime Minister Trudeau. In the video, Trudeau appeared to support a book entitled "How The Prime Minister Stole Freedom." Of course, the video was not authentic and was widely presumed to be a political attack against Trudeau.[3]

Another example of deepfake occurred in 2023 when police arrested Donald Trump in New York City. Shortly after the arrest, numerous deepfake images involving Trump – including the one pictured in **Figure 35** appeared on the Internet. These images purported to show Trump resisting

[3] To learn more about Trudeau's deepfake, visit https://k2e.fyi/trudeau.

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arrest. Of course, like the Trudeau deepfake mentioned above, the AI-generated images depicted scenarios that never occurred.



Figure 35 - Deepfake Image Involving Donald Trump

Hallucinations

The final AI risk to discuss is hallucinations. In the AI field, a hallucination occurs when a user prompts an AI tool, and the tool replies with an incorrect response. Hallucinations can occur for several reasons. Often, they appear when the AI platform does not receive training on sufficient or accurate data. They can also happen when the AI platform lacks access to enough computing power. Further, hallucinations can appear when a user's prompt is unclear or inadequate. And in some cases, hallucinations result from random or unexplained reasons.

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No matter their cause, hallucinations can be harmful and misleading, particularly when they involve sensitive or critical information. Therefore, business professionals should exercise due care and diligence to monitor and evaluate the AI tool's results. Further, using multiple AI platforms and cross-checking the results may also be warranted, depending on the circumstances involved.

Case Study In Hallucinations

In 2023, a lawsuit filed against Avianca by a passenger erupted into a legal firestorm when lawyers discovered that several court cases referenced by the plaintiff's attorney were, in fact, AI-generated hallucinations. Following is the text of an article written by Benjamin Weiser and published in The New York Times on May 27, 2023. The article describes in detail the now-infamous hallucination.

> *The lawsuit began like so many others: A man named Roberto Mata sued the airline Avianca, saying he was injured when a metal serving cart struck his knee during a flight to Kennedy International Airport in New York.*
>
> *When Avianca asked a Manhattan federal judge to toss out the case, Mr. Mata's lawyers vehemently objected, submitting a 10-page brief that cited more than half a dozen relevant court decisions. There was Martinez v. Delta Air Lines, Zicherman v. Korean Air Lines and, of course, Varghese v. China Southern Airlines, with its learned discussion of federal law and "the tolling effect of the automatic stay on a statute of limitations."*
>
> *There was just one hitch: No one — not the airline's lawyers, not even the judge himself — could find the decisions or the quotations cited and summarized in the brief.*
>
> *That was because ChatGPT had invented everything.*
>
> *The lawyer who created the brief, Steven A. Schwartz of the firm Levidow, Levidow & Oberman, threw himself on the mercy of the court on Thursday, saying in an affidavit that he had used the artificial intelligence program to do his legal research — "a source that has revealed itself to be unreliable."*
>
> *Mr. Schwartz, who has practiced law in New York for three decades, told Judge P. Kevin Castel that he had no intent to deceive the court or the airline. Mr. Schwartz said that he had never used ChatGPT, and "therefore was unaware of the possibility that its content could be false."*
>
> *He had, he told Judge Castel, even asked the program to verify that the cases were real.*
>
> *It had said yes.*
>
> *Mr. Schwartz said he "greatly regrets" relying on ChatGPT "and will never do so in the future without absolute verification of its authenticity."*

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Judge Castel said in an order that he had been presented with "an unprecedented circumstance," a legal submission replete with "bogus judicial decisions, with bogus quotes and bogus internal citations." He ordered a hearing for June 8 to discuss potential sanctions.

As artificial intelligence sweeps the online world, it has conjured dystopian visions of computers replacing not only human interaction, but also human labor. The fear has been especially intense for knowledge workers, many of whom worry that their daily activities may not be as rarefied as the world thinks — but for which the world pays billable hours.

Stephen Gillers, a legal ethics professor at New York University School of Law, said the issue was particularly acute among lawyers, who have been debating the value and the dangers of A.I. software like ChatGPT, as well as the need to verify whatever information it provides.

"The discussion now among the bar is how to avoid exactly what this case describes," Mr. Gillers said. "You cannot just take the output and cut and paste it into your court filings."

The real-life case of Roberto Mata v. Avianca Inc. shows that white-collar professions may have at least a little time left before the robots take over.

It began when Mr. Mata was a passenger on Avianca Flight 670 from El Salvador to New York on Aug. 27, 2019, when an airline employee bonked him with the serving cart, according to the lawsuit. After Mr. Mata sued, the airline filed papers asking that the case be dismissed because the statute of limitations had expired.

In a brief filed in March, Mr. Mata's lawyers said the lawsuit should continue, bolstering their argument with references and quotes from the many court decisions that have since been debunked.

Soon, Avianca's lawyers wrote to Judge Castel, saying they were unable to find the cases that were cited in the brief.

When it came to Varghese v. China Southern Airlines, they said they had "not been able to locate this case by caption or citation, nor any case bearing any resemblance to it."

They pointed to a lengthy quote from the purported Varghese decision contained in the brief. "The undersigned has not been able to locate this quotation, nor anything like it in any case," Avianca's lawyers wrote.

Indeed, the lawyers added, the quotation, which came from Varghese itself, cited something called Zicherman v. Korean Air Lines Co. Ltd., an opinion purportedly handed down by the U.S. Court of Appeals for the 11th Circuit in 2008. They said they could not find that, either.

Judge Castel ordered Mr. Mata's attorneys to provide copies of the opinions referred to in their brief. The lawyers submitted a compendium of eight; in most cases, they listed the court and judges who issued them, the docket numbers, and dates.

The copy of the supposed Varghese decision, for example, is six pages long and says it was written by a member of a three-judge panel of the 11th Circuit. But Avianca's lawyers told the judge that they could not find that opinion, or the others, on court dockets or legal databases.

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Bart Banino, a lawyer for Avianca, said that his firm, Condon & Forsyth, specialized in aviation law and that its lawyers could tell the cases in the brief were not real. He added that they had an inkling a chatbot might have been involved.

Mr. Schwartz did not respond to a message seeking comment, nor did Peter LoDuca, another lawyer at the firm, whose name appeared on the brief.

Mr. LoDuca said in an affidavit this week that he did not conduct any of the research in question, and that he had "no reason to doubt the sincerity" of Mr. Schwartz's work or the authenticity of the opinions.

ChatGPT generates realistic responses by making guesses about which fragments of text should follow other sequences, based on a statistical model that has ingested billions of examples of text pulled from all over the Internet. In Mr. Mata's case, the program appears to have discerned the labyrinthine framework of a written legal argument, but has populated it with names and facts from a bouillabaisse of existing cases.

Judge Castel, in his order calling for a hearing, suggested that he had made his own inquiry. He wrote that the clerk of the 11th Circuit had confirmed that the docket number printed on the purported Varghese opinion was connected to an entirely different case.

Calling the opinion "bogus," Judge Castel noted that it contained internal citations and quotes that, in turn, were nonexistent. He said that five of the other decisions submitted by Mr. Mata's lawyers also appeared to be fake.

On Thursday, Mr. Mata's lawyers offered affidavits containing their version of what had happened.

Mr. Schwartz wrote that he had originally filed Mr. Mata's lawsuit in state court, but after the airline had it transferred to Manhattan's federal court, where Mr. Schwartz is not admitted to practice, one of his colleagues, Mr. LoDuca, became the attorney of record. Mr. Schwartz said he had continued to do the legal research, in which Mr. LoDuca had no role.

Mr. Schwartz said that he had consulted ChatGPT "to supplement" his own work and that, "in consultation" with it, found and cited the half-dozen nonexistent cases. He said ChatGPT had provided reassurances.

"Is varghese a real case," he typed, according to a copy of the exchange that he submitted to the judge.

"Yes," the chatbot replied, offering a citation and adding that it "is a real case."

Mr. Schwartz dug deeper.

"What is your source," he wrote, according to the filing.

"I apologize for the confusion earlier," ChatGPT responded, offering a legal citation.

"Are the other cases you provided fake," Mr. Schwartz asked.

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ChatGPT responded, "No, the other cases I provided are real and can be found in reputable legal databases."

But, alas, they could not be.

Perhaps the best lesson to learn from this situation is this: As good as AI is, it is not perfect and is not likely to become perfect. Therefore, we must exercise due care when working with AI platforms and maintain a healthy dose of professional skepticism regarding the responses we receive and the information we gather using AI tools. Further, we need to confirm and verify sources, citations, and footnotes provided by our AI platforms to ensure that we and those who rely upon us do not become victims of AI hallucinations.

AI And Ethics

With AI, ethical considerations are a prime concern. As indicated earlier, data security and data privacy are closely related. However, the ethical implications of AI extend beyond data security and privacy. They encompass issues such as *transparency*, *accountability*, and *fairness*. For instance, AI systems should be transparent in their operations, providing clear explanations for their decisions. This attribute is essential in high-stakes domains such as healthcare or criminal justice, where AI decisions can profoundly impact individuals' lives.

Accountability is another critical ethical consideration. If an AI system makes a mistake or causes harm, it is essential to have mechanisms in place to identify the root cause of the issue and hold the appropriate parties accountable. Potentially, those held accountable could include the developers of the AI system, the organization deploying it, or even users of the system itself.

Fairness is also a significant ethical concern in AI. AI systems should not perpetuate or exacerbate existing social inequalities. Instead, developers and engineers should design and deploy AI platforms fairly and equitably to all parties, avoiding bias in their decision-making processes.

To summarize, the ethical implications of AI are vast and complex, encompassing issues such as data security, transparency, accountability, and fairness. As AI continues to evolve and permeate various aspects of society, it is crucial to continue the conversation about these ethical considerations and develop robust frameworks to address them. These actions will help ensure that individuals use AI to respect individuals' rights and contribute positively to society.

Other AI Options

So far, we have focused on generative AI tools, such as ChatGPT, Gemini, and Copilot. However, other AI tools exist, and many merit consideration for adding them to your portfolio. Below is a listing of these tools and a summary of their features.

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DALL-E

DALL-E is an AI application you can use to generate images from textual descriptions. OpenAI (ChatGPT's parent company) created DALL-E, and you can use the tool to create images of objects, animals, scenes, and even abstract concepts. For example, you can use DALL-E to generate a picture of a "dog wearing a blue pinstripe suit" or an "accountant on April 15." You can also use DALL-E to change image attributes, such as shape or color. You can obtain more information at https://openai.com.

Grammarly

Grammarly is a consolidated grammar, style, and spellcheck tool designed to enhance your writing and minimize mistakes. Grammarly goes beyond simple spellcheck functions to help you generate straightforward, concise, and engaging content. Further, Grammarly's integration with other tools – such as Microsoft Word – makes the app easy to access and use. With Grammarly's Plagiarism Checker and Paraphrasing Tools, you can ensure the content you generate is original and readable. You can obtain more information at https://www.grammarly.com/business.

Jasper

Similar in some respects to Grammarly, Jasper.ai is another cloud-based AI tool to help you generate content that readers find to be clear, concise, and meaningful. With Jasper.ai, you can generate text, images, videos, and audio. Further, you can tweak the content to match your intended audience, tone, and style. You can obtain more information at https://jasper.ai.

MindBridge

Unlike some of the other tools discussed in this section, MindBridge is an AI-based platform designed to help accountants and auditors identify and assess risks, make prior period comparisons, and engage in predictive analytics to identify anomalies in account balances. With MindBridge, risk assessment and identification efforts are more efficient and productive, helping accountants and auditors identify areas that require attention. You can obtain more information at https://www.mindbridge.ai/.

Originality

Originality.ai is a platform designed to help you publish content free of plagiarism and full of facts. As indicated in this session, search engines and AI make it too easy for some to take potentially unethical and illegal approaches to generating content. To combat this issue, Originality helps you identify content that AI has generated, detect plagiarism, and check facts. You can obtain more information at https://originality.ai.

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Otter.ai

Otter.ai offers a different approach to AI than the other tools mentioned in this section. Specifically, Otter uses AI to enhance the efficiency and effectiveness of online meetings. For example, you can use OtterPilot to connect your Microsoft or Google-powered calendar to auto-join Zoom, Meet, or Teams meetings and take and share meeting notes. Otter can also capture meeting slides and add them to the notes it takes on your behalf to help you and others recall relevant and necessary details from your meetings. You can obtain more information at https://otter.ai.

?	Which, if any, of the tools mentioned above do you use presently? Which might you want to try now that you know more about AI?

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Automation Essentials

Chapter 5

Automation has been a topic of consideration for business professionals – including those engaging in accounting and financial functions – since Pascal invented the adding machine in 1642. Today, automation is one of the hottest topics in business circles as organizations try to become as efficient as possible in response to demands from owners and the increasing reality of labor shortages. In this chapter, you learn the essentials of automation, including the importance of automating existing workflows and some tools available to assist with your automation efforts.

Learning Objectives

Upon completing this chapter, you should be able to:

- List at least two drivers for today's push to automate business processes and workflows;
- Identify at least three business workflows that are prime candidates for automation;
- Name at least three tools to assist with your automation efforts; and
- Cite at least three benefits associated with successful automation efforts.

Drivers For Today's Automation Efforts

As indicated above, the desire to automate business processes and workflows is not new. But the drivers of that desire have no doubt changed over time. When Ford introduced the Model T in 1908, a key driver was to mass-produce the vehicle. Consequently, standardized workflows began to appear, with every Model T coming off the assembly line built the same way. By dispensing with one-off and customized production, workers could produce more vehicles than if they had held onto traditional production processes. Even though the production line was not "automated," it was undoubtedly "standardized," which set the stage for lower per-unit costs and improved quality and reliability. Today's automation efforts seek to do the same – work efficiently, with higher quality rates and reduced errors.

In addition, today's automation efforts also seek to address what could be the most significant issue facing businesses over the next century – labor shortages. Almost every participant in this session has undoubtedly experienced the impact of labor shortages over recent years. Some may have experienced it as a consumer attempting to get customer assistance or service. Others have experienced it on the other side of the desk, as a manager trying to hire qualified and competent team members and often failing to find qualified workers.

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We will not easily manage through the labor shortage affecting almost all businesses in nearly all industrialized countries. The fact is that there are not enough qualified workers to do all the work. Although some will point to the COVID-19 pandemic as the driver behind today's labor shortages, we must understand that the deficit would have happened with or without the pandemic. To be sure, COVID-19 did not help, but we were destined to have today's labor shortages regardless. Consider the chart pictured in **Figure 36**. In it, you see that the birth rate in the United States is approximately one-half of what it was in 1950. Complicating matters further is that many Baby Boomers are on the cusp of retiring. So, we now face a reduction in new workers entering the workforce and an impending mass exodus from the Baby Boomers. Perhaps even more alarming is that data from the US Census Bureau indicates that the United States could experience real population declines as early as 2080, depending on immigration policies.

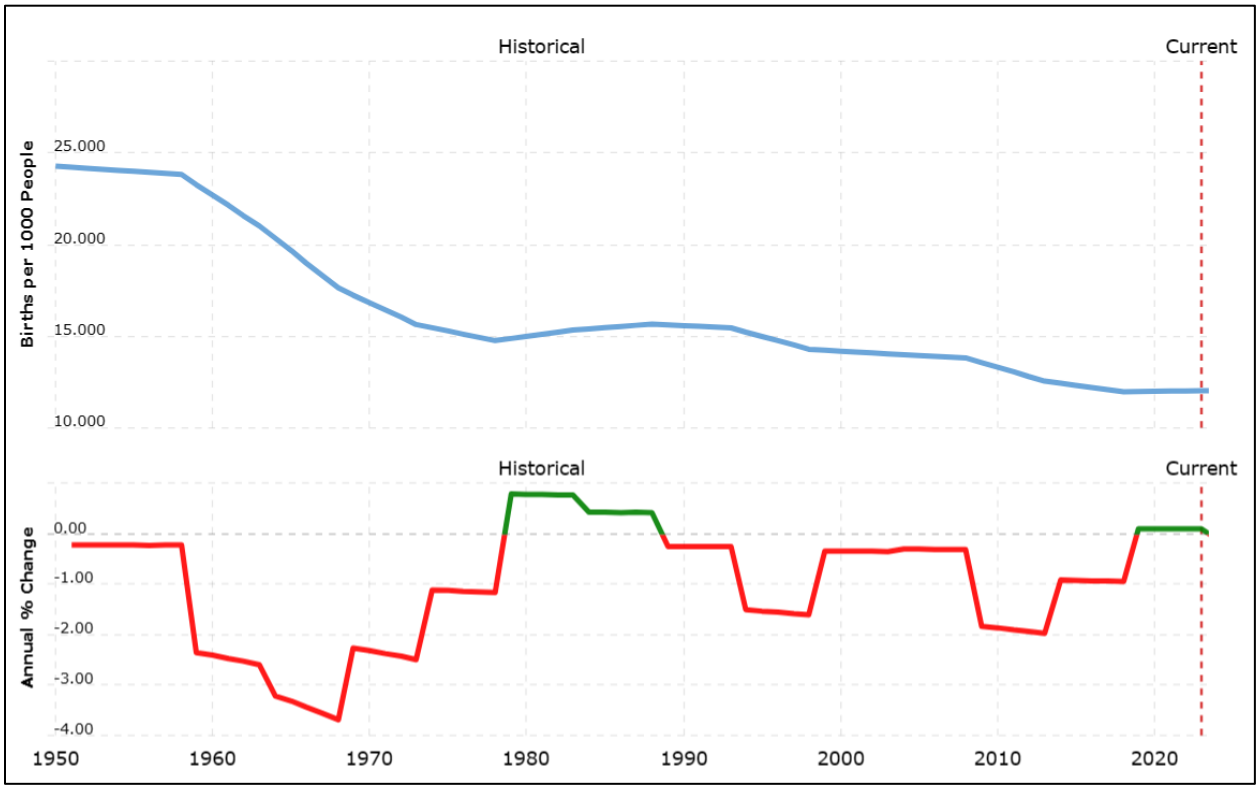

Figure 36 - The Birth Rate In The United States Is Now Approximately One-Half Of Its' 1950 Level

Similar to the United States, **Figure 37** illustrates that the birth rate in Canada has also fallen by approximately half. An examination of most industrialized nations indicates the same general trend in these countries, and Japan has already experienced a population decline.

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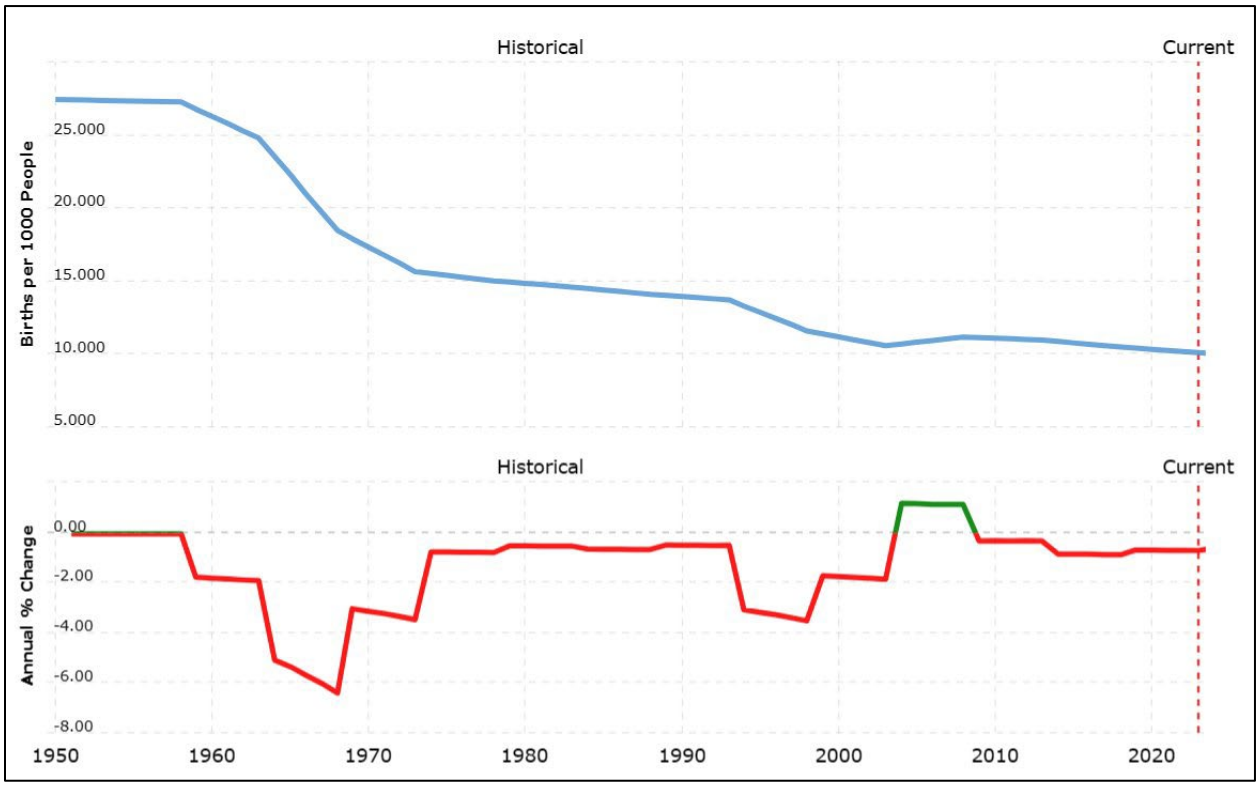

Figure 37 - The Birth Rate In Canada Is Also Now Approximately One-Half Of Its' 1950 Level

These population trends should cause us to ask, "Where will our workers come from." The answer – in many cases – could be automation.

Business Workflows Ideal For Automation

If automation is the answer to a declining workforce, the next question is what type of tasks lend themselves to automation. You will want to look for transactions, tasks, and events with one or more of the following characteristics to succeed with your automation efforts.

- Transactions are repetitive, such as booking a journal entry repeatedly,
- Transactions require entry into a database, such as entering W-2 forms into an income tax application, or
- Transactions that have little variability, such as bills arriving from the same vendor.

Repetitive Transactions

For starters, consider repetitive transactions, such as a journal entry entered each month to record estimated depreciation expense. Almost all accounting applications now support some level of "memorized" transactions. Why, therefore, do we insist on manually entering the transaction repeatedly when we could automate it instead?

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Transactions Requiring Entry Into A Database

Today's "scan-and-populate" tools work extremely fast and possess outstanding accuracy rates. Given those attributes, why do we manually enter data into databases? Instead, could we not take advantage of scan-and-populate to, for example, automatically populate income tax returns with scanned taxpayer data such as 1099s, W2s, K-1s, and the like? Wouldn't automating those processes be faster and more accurate than traditional data entry?

Transactions With Little Variability

Another prime candidate for automation is groups of transactions with little variability, such as accounts payable bills from the same vendor. Because the vendor is not likely to change the form's format, couldn't we "train" an accounts payable process to recognize fields on the form, such as date, terms, amount, etc., and extract these fields? Once extracted, could the application save the extracted data in the database while we await approval and payment?

The three examples mentioned above do not list all the options available. However, they should help us understand at least some of the opportunities available with this "low-hanging fruit" so we can begin to harvest automation's benefits.

Automation Tools

Many tools exist to help you experience the benefits of automation, including the following:

- Tools built into your accounting applications and services,
- Simple automation tools such as Zapier and IFTTT
- Microsoft Excel's Power Query feature,
- Microsoft's Forms and Power Automate tools,
- Third-party automation tools such as Blue Prism and Automation Anywhere

Automation Tools In Accounting Applications

Often, the most straightforward tools provide the greatest return on investment, and today's accounting applications and services offer many built-in automation tools to help you save time and increase accuracy. Bank feeds are a great example.

Virtually every accounting application available on the market supports built-in bank feeds. With bank feeds, you can connect your bank account(s) electronically to your accounting application or service. Upon doing so, as transactions clear your bank account, the bank feed process marks the transaction as cleared on your bank reconciliation. Further, as new transactions not recorded previously clear through your bank account, the bank feed process records the new transactions in your accounting application. The primary benefit of using bank feed processes is they help you minimize the amount of time you spend recording transactions that appear in your bank account and dramatically reduce the amount of time you might spend reconciling your accounts.

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Another example of automation opportunities in many of today's accounting software tools is built-in workflow rules. Many accounting software applications – including those at the small business end of the market, such as Zoho Books and QuickBooks Online – now allow you to create customized workflow rules that control the flow of transactions. Suppose, for example, you need to create a workflow rule in QuickBooks Online that mandates all accounts payable bills exceeding $1,000 go through a customized approval process. As shown in **Figure 38**, you can create customized workflows that route your documents automatically to the intended approver(s). Using this type of automation, we can ensure that all transactions follow prescribed workflow procedures, thereby improving efficiency, accuracy, and internal control.

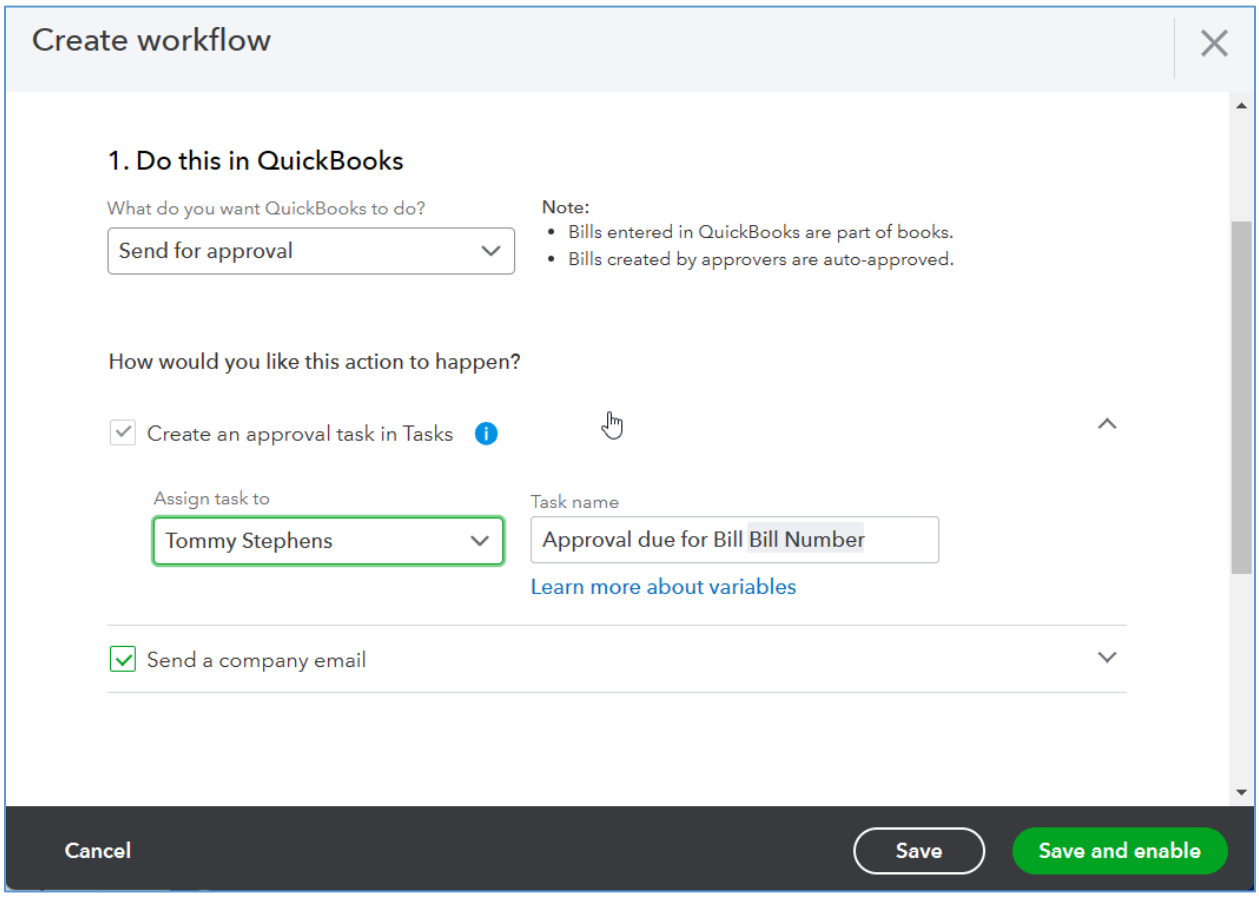

Figure 38 – Creating A Customized Workflow In QuickBooks Online

Simple Automation And Integration Tools Such As Zapier And IFTTT

In addition to automating workflows within a single application or service – such as the approval workflow outlined above – you might also need to use automation tools to link two services together. For example, suppose you engage in e-commerce activities and use Shopify to power your e-commerce platform. Further, suppose you use Zoho Books as your accounting platform. In that case, you might be under the impression that electronically moving all the sales transactions from Shopify into Zoho may be challenging. In fact, it is relatively easy to complete this task using the automated process available from Zapier. Upon establishing your Zapier

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account, you can link it to your Zoho Books account by entering your username and password for each account into Zapier. Upon doing so, your sales transactions will flow automatically from Zapier into Zoho Books, with no manual intervention required. **Figure 39** illustrates this process.

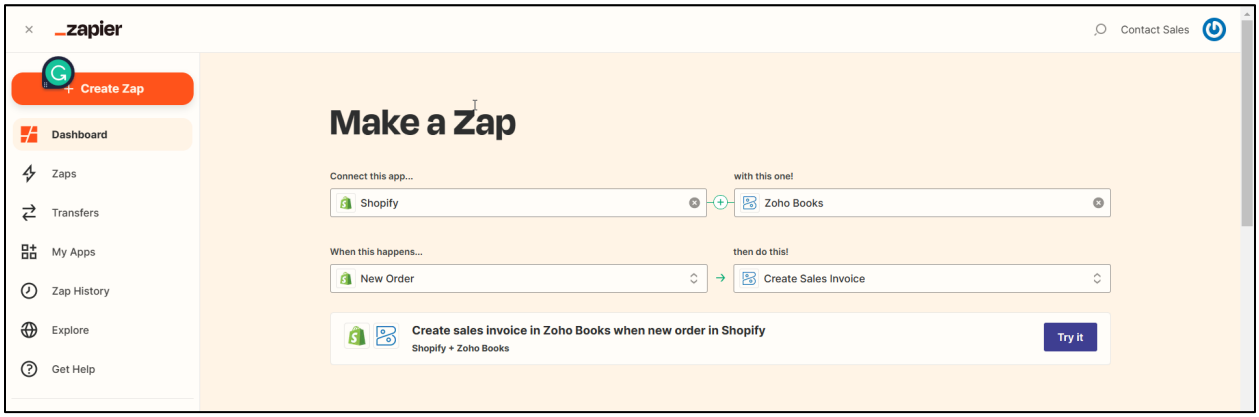

Figure 39 – Integrating Zapier With Zoho Books

Zapier makes over 6,000 similar integrations available from their platform at https://zapier.com, and the platform integrates with most major business-oriented platforms in use, including Microsoft 365, QuickBooks Online, Google, Slack, Salesforce, HubSpot, PayPal, Dropbox, and DocuSign.

Microsoft's Power Query

Power Query is a Microsoft automation tool that is available in Excel and Power BI. You can use Power Query to modify data you want to link to Excel or Power BI. Microsoft terms these modifications "transformations." Transformations can be relatively simple, such as adding and deleting columns, sorting data, filtering data, and adding a formula. However, they can also be much more sophisticated, such as merging, pivoting, and unpivoting data. Notably, once you create a transformation, all the transformations in that query update each time you refresh the query. Therefore, once you create the query with its' attendant transformations, you never have to create them again, saving valuable time and improving accuracy.

Microsoft's Power Automate

Microsoft's Power Automate platform is often considered a "stronger" version of Zapier, IFTTT, and similar tools. With Power Automate, you can create custom automations to satisfy almost any need. For instance, you can use Power Automate to automate approvals of invoices, credit memos, and PTO requests. Similarly, you can use Power Automate to link data from your organization's social media platforms into Excel or Power BI. Although you can use Power Automate to create customized workflows, in many cases, you can use existing Power BI templates to satisfy your needs. With hundreds of templates available, you can likely create your automated workflow by merely modifying an existing template. **Figure 40** illustrates some of the templates available.

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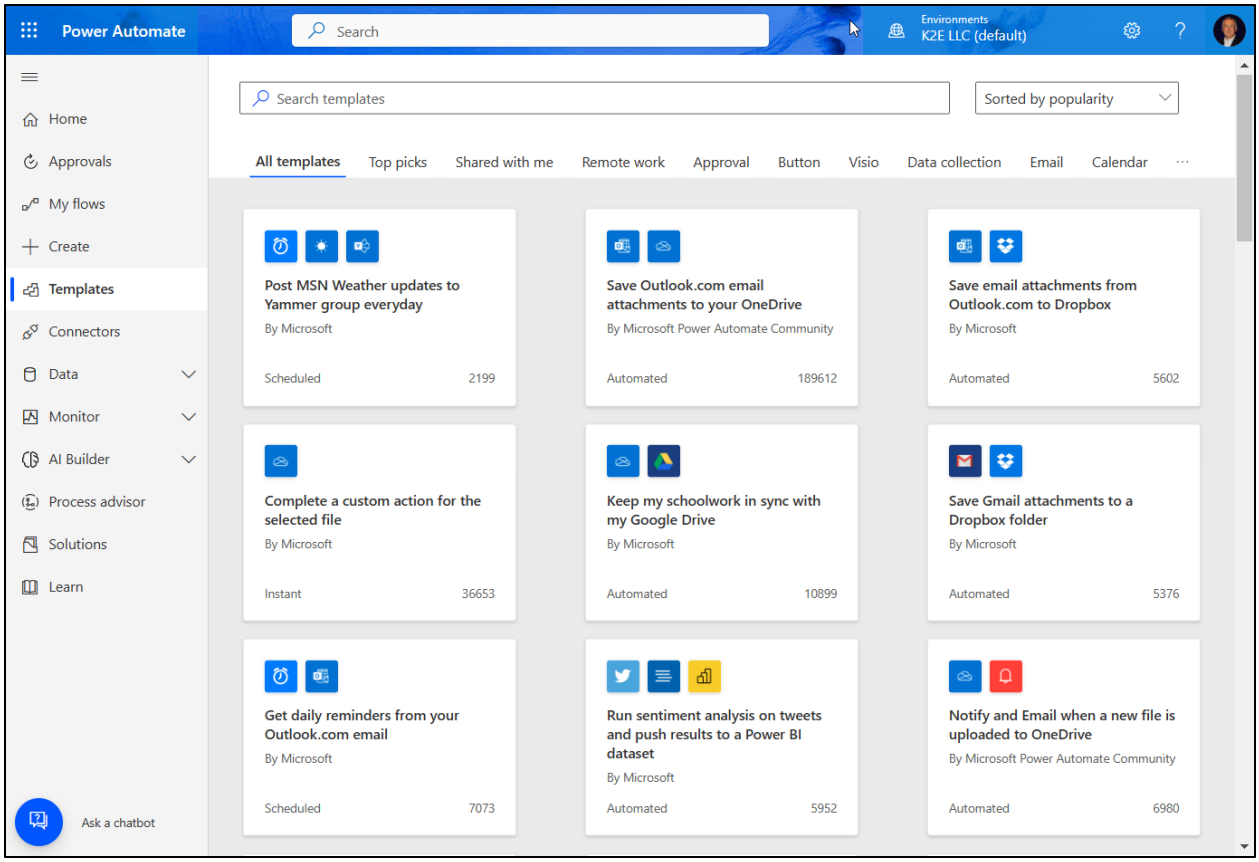

Figure 40 – Examples Of Power Automate Templates

In addition to the various templates available, Power Automate provides access to data connectors designed to automate linking data into the service. Further, many data connectors are available for no additional charge, although third-party charges may apply to others.

Third-Party Automation Tools Such As Blue Prism And Automation Anywhere

If your automation needs exceed the capabilities provided by Power Automate, another class of tools is available to address advanced needs. Specifically, tools such as Blue Prism and Automation Anywhere could be helpful in those circumstances. However, most users will likely find Power Automate to contain the necessary feature set to satisfy all but the most complex and demanding tasks.

Automation Benefits

If you proceed down the automation path, what benefits can you expect to realize? Undoubtedly, you will see time savings almost immediately once you automate tasks. The mere fact that you and your team are no longer wasting time on rote and repetitive tasks will pay real and tangible benefits from day one.

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Another benefit associated with automation is improved internal control. Because all team members will follow automated and electronically-enforced workflows, deviations from standard workflows will decline. Thus, internal control should improve because all team members will follow the same "playbook." Further, the automation platform may automatically record variations from standard workflows and report them to managers for follow-up. These activities effectively create deterrent internal controls, helping to ensure that team members follow established policies and procedures, with exceptions only on an emergency basis.

Better accuracy is another benefit accruing from automation. By automating as many clerical tasks as possible, including those that involve manual calculations, you will minimize the opportunity for clerical errors in calculations and data entry. This trait reduces the risk of an undetected mathematical error slipping through existing business workflows. Time savings will accrue because team members will no longer spend as much time searching for and correcting mistakes.

Processing fewer transactions – most of which are standardized – in an environment with sound internal control – should help speed processing times and improve customer/client service. To summarize, automation should provide most businesses with the following tangible benefits.

- Time savings
- Improved internal control
- Better accuracy
- Faster turnaround times
- Improved customer/client service

?	What automation opportunities are available for your organization or a client's organization? What might be the expected benefits of moving forward with the project? And what obstacles might you encounter?

Summary

Today's information workers face more challenges than ever. However, they also have more tried-and-tested tools to help them solve these challenges. This trait has never been more true than it is now in artificial intelligence and automation. Further, because most business professionals already have access to these tools, there is no reason not to embrace AI and automation immediately. Remember, the future of your business may depend on it!

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