I INSIDE COPILOT

Microsoft Copilot for Windows 11

Understanding the AI-Powered Features in Windows 11

Anand Narayanaswamy

Apress®

Inside Copilot

Inside Copilot is designed to teach users to master Copilot, Microsoft's generative AI assistant. Learn prompt engineering and use cases for Copilot in many Microsoft products at beginner, intermediate, and expert levels. Perfect for any professionals who find their schedules packed with repetitive computer tasks, Copilot can automatically generate PowerPoint presentations, draft emails on Outlook, write code on GitHub, and more. Both companies and individuals can learn to utilize Copilot to significantly speed up processes and gain an advantage.

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About the Author

Anand Narayanaswamy works as an author, reviewer, and blogger based in Thiruvananthapuram, Kerala, India. He was recognized as a Microsoft MVP from 2002 to 2011 and Windows Insider MVP from 2019 to 2023 and is currently a Microsoft MVP in Windows and Devices. Anand contributes articles to leading online and print publications. He runs his blogs (netans.com and surfacebuzzer.com) and actively helps the Windows community on Quora. In his spare time, Anand loves to dig old gadgets like Microsoft Zune, iPod, and iPod Classic. He can be reached via https://twitter.com/visualanand, www.instagram.com/netanstech, and www.linkedin.com/in/anandnswamy.

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Introduction

AI has taken over the world by storm. Microsoft took the plunge by entering into the AI market with the launch of Bing Chat in February 2023. Even though Microsoft initially integrated AI chat into Bing, the subsequent months saw rapid developments with great improvements. This includes the relaxation of daily limits and the integration of Bing Chat in Microsoft Edge and Skype. Microsoft took the entire tech community by surprise by renaming Bing Chat as Microsoft Copilot in September 2023. Microsoft quickly replaced all instances of Bing Chat as Copilot with a new logo. Microsoft adopted the changes in war footing mode including the launch of Copilot Pro. Currently, Microsoft Copilot can be accessed via Windows 11, Edge, Bing, Skype, Microsoft 365, and over the Web. Moreover, Copilot is also available as a separate app via the Microsoft Store in addition to Android and iOS mobile apps. Microsoft ventured into AI image creation with Bing Image Creator, which is currently Image Creator.

Microsoft Copilot for Windows 11 kicks off with a brief overview of Generative AI and then delves deep into the evolution of Microsoft Copilot. The remaining chapters thoroughly examine the steps required to work with Microsoft Copilot in various ways including Microsoft 365. The author delves deep into the concepts with the help of concise explanations and companion screenshots. Do you want to generate AI images? We've got you covered. The book provides a comprehensive coverage of Microsoft Designer, which is used to create stunning visuals for all occasions in addition to advanced tasks. The book also covers the latest trending technologies like the Copilot key and Copilot+ PCs. Moreover, the facts enclosed inside notes in between the content amplify your Copilot

learning experience. The book also includes a compact glossary related to AI and Copilot. You just need to sit before your PC and follow the instructions.

The author has adopted a lucid writing style to make sure that beginners can grasp the content quickly. Moreover, the book will be an ideal companion for students who would like to learn about Microsoft Copilot. Naturally, senior citizens won't be able to understand the usage and benefits of Copilot unless we teach them. With the help of this book, they will be able to sit and learn themselves without any assistance. The book has been written in such a way that even a school-going kid can easily master the usage of Microsoft Copilot in Windows 11. You can impress your friends by showcasing your Copilot skills.

The purpose of this book is to educate people about the features and usage of Microsoft Copilot in addition to the latest advancements under a single umbrella. After reading the book, you will be able to work with Microsoft Copilot features in Windows 11 and make the most of it with confidence.

What This Book Covers

Chapter 1: Evolution of Microsoft Copilot provides a short introduction to Generative AI followed by the various phases of Microsoft Copilot and associated products.

Chapter 2: Working with Copilot in Windows 11 – Part 1 helps you learn the steps that are required to work with Microsoft Copilot using Windows 11 search.

Chapter 3: Working with Copilot in Windows 11 – Part 2 examines the working of Copilot via the Windows 11 Taskbar. You will learn the required steps to complete various tasks using Copilot easily.

Chapter 4: Working with Copilot Using Microsoft Edge enables you to learn steps to work with Copilot using the Microsoft Edge browser.

Chapter 5: Working with Copilot Using Bing examines the usage of Copilot from within Bing, which is a popular search engine from Microsoft.

Chapter 6: Working with Copilot Using Skype provides coverage of the usage of Copilot from within the popular messaging app.

Chapter 7: Working with Copilot Web delves deep into the functioning of the Copilot web dashboard. The topics related to GPTs and plugins have been covered in detail.

Chapter 8: Working with Image Creator – Do you want to create stunning AI images? This chapter is here to your rescue.

Chapter 9: Working with Microsoft Designer provides a comprehensive coverage of the Designer tool using which you can create your AI-enabled properties.

Chapter 10: Using Copilot in Microsoft 365 examines the usage of Copilot in Microsoft 365 apps such as Word, Excel, and PowerPoint.

Chapter 11: Learning Microsoft Copilot with Windows App examines the usage of the Copilot desktop app in detail.

Chapter 12: Devices with Copilot Key enables you to know about the features and list of devices with the Copilot key.

Chapter 13: Introducing Copilot+ PCs provides a list of devices tagged as Copilot+ PCs.

Appendix A: Glossary – You will learn important terms associated with AI and Copilot.

Appendix B: Additional resources – You can update yourself about Microsoft Copilot by navigating to the mentioned resources.

What You Will Learn

- Various ways of working with Copilot in Windows 11
- GPTs and plugins in Microsoft Copilot
- Benefits of Copilot Pro

- Copilot in Microsoft 365
- Image Creator and Microsoft Designer
- Copilot key and Copilot+ PCs

System Requirements

You require a PC/laptop running Windows 11 to follow the contents included in this book. However, you can work with Copilot Web, Image Creator, and Microsoft Designer using macOS. You need Internet connectivity to work with Microsoft Copilot.

The availability of Microsoft Copilot depends upon the region. However, you can access Copilot Web and Copilot Windows apps irrespective of the region. Copilot in Windows (preview) is currently available in North America, the UK, India, parts of Asia, and South America.

Disclaimer

This book contains images that are generated via Microsoft Copilot, Image Creator, and Microsoft Designer. The AI-enabled images are only used for the sake of explanation and educational purposes. The images have no relationship with any existing humans and properties.

CHAPTER 1

Evolution of Microsoft Copilot

Generative AI, also called GenAI, is capable of generating content, images, and videos with the help of GPT/non-GPT models. The technology works when a user provides the required query, also called a prompt. Initially, Generative AI–based systems were used to create content like articles, but now the platform is also used to create images, videos, and even audio. Even though this book focuses on Microsoft Copilot, it's essential to understand the basics of Generative AI and related technologies. This chapter provides a short introduction to Generative AI followed by the evolution of Microsoft Copilot in detail.

Introducing Generative AI

Generative AI models work by learning the patterns and training data structure. The system generates new data based on similar features. The spike in the Generative AI chatbots during the late 2020s is mainly due to the improvements in transformer-enabled deep neural networks such as Large Language Models (LLMs). These chatbots comprise ChatGPT, Microsoft Copilot and Google Gemini, LLaMA, and image generation platforms like Midjourney. Generative AI can be leveraged by several industries such as software, healthcare, entertainment, finance, sales, marketing, content writing, fashion, and much more.

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It all started at Dartmouth College in 1956 where the academic department of artificial intelligence (AI) was established during the sidelines of a research workshop. The researchers have seen several advancements in AI after that. However, they have raised suspicion about the nature of so-called artificial elements. The main query was whether the technology would be able to beat human intelligence. The cost involved in the development of AI is high because powerful machines are required to store data and commands. The Dartmouth Summer Research Project on AI took a clarion call for AI research, and this step has changed the scenario. Ever since the introduction of AI, artists have been making use of AI to create artistic works. In 1970, Harold Cohen created and exhibited Generative AI works created by the AARON programming language. Cohen developed AARON to generate paintings.

Technology Background

The deep learning technologies related to AI emerged during the late 2000s. These include natural language processing, image classification, speech recognition, and other related tasks. The neural networks were trained as discriminative models because of the difficulty in generative modeling. The variational autoencoder and generative adversarial network technologies produced the first deep neural networks capable of learning generative models in 2014. The discriminative models are said to be a major advancement in the field of AI and Machine Learning. These models are algorithms that are developed to not only learn the various classes but also categories in a dataset. A classic example of a discriminative model is Support Vector Machine (SVM), which is widely used for classification tasks.

The transformer network enabled advancements in Generative AI models in 2017. Previously, Long Short-Term Memory models were used that were not effective. The end result was the emergence of the first iteration of the generative pre-trained transformer (GPT-1) in 2018. This discovery has set the road map for future advancements. The GPT-2 launched in 2019 provided an ability to generalize several unsupervised

tasks as a basic foundation model. The advanced imaging model named DALL·E was introduced in 2021 as a transformer-based pixel generative model. Microsoft integrated the DALL·E model into Copilot after testing the technology successfully with the original Bing Chat. Moreover, Copilot has been aggressively integrated into Microsoft Designer using which you can create stunning images, wallpapers, greeting cards, stickers, avatars, emojis, cliparts and much more.

The launch of Midjourney and Leonardo has set new dimensions to the advanced AI-based image generation from natural language prompts. OpenAI released GPT-4 in March 2023, which was regarded as an incomplete version of an artificial general intelligence (AGI) system by Microsoft. The company recently released GPT-4o, which is capable of generating images and videos. Meta also announced AI integration with WhatsApp and Instagram but is available only in select regions.

While unimodal Generative AI systems accept one type of input, multimodal systems are capable of accepting multiple types of input. For instance, GPT-4 accepts both text and image inputs. With Microsoft Copilot, you can provide prompts either as text or images. Copilot also provides the ability to scrape through an active PDF file. You can ask Copilot to generate a suitable title or seek additional information about the image using a suitable prompt.

Generative AI systems are trained on words that are modified to tokens, which LLMs can access. Some of the popular LLMs are GPT-3, GPT-4, GPT-4o, LaMDA, LLaMA, Gemini, Meta AI, and Grok. These technologies are capable of performing natural language processing and generation including machine translation. They make use of datasets via Wikipedia. Moreover, LLMs are also trained based on publicly available massive indexed data on search.

GPT models are aggressively trained in several programming languages such as HTML, C++, C#, Visual Basic, and Java in addition to older languages like COBOL, PASCAL, FORTRAN, and others. AI chatbots like Microsoft Copilot and Google Gemini generate source code based on

the required command. Generative AI platforms are capable of generating stunning images and are trained via Imagen, DALL·E, Midjourney, and Stable Diffusion, among others. You can create images using lengthy prompts with the help of Microsoft Copilot.

The Generative AI technology can generate audio by leveraging natural speech synthesis and text-to-speech (TTS) capabilities. Third-party AI tools such as ElevenLabs, MusicLM, and MusicGen have the required capability to produce audio from the text prompt. You can use Microsoft Copilot to create songs based on the provided prompt. In addition to audio, you can use third-party tools such as FlexClip and Veed to create videos based on the input. You should note that the produced video won't be accurate because of the nature of the AI technology. Nowadays, researchers are aggressively using Generative AI by training them in robotics. Even medical professionals have been employing AI. Google has been involved in the development of UniPi and RT-2 multimodal vision-language-action models that can change the way we work with robots.

Generative AI models are used in several popular chatbot tools such as ChatGPT, Microsoft Copilot, GitHub Copilot, Google Gemini, Meta AI via LLaMA, Midjourney, and Stable Diffusion. The features are also integrated with Microsoft 365, which enables enterprise companies to leverage the benefits of Copilot.

Generative AI has the potential to create new content such as text, code, images, and videos with the help of AI models. With the help of AI, you can automate code generation/completion and suggestions. Microsoft has integrated GitHub Copilot into Visual Studio, which will minimize the time involved in programming. AI can be used to enhance code quality, bug checking, and other critical vulnerabilities. You can make use of GenAI chatbots like Microsoft Copilot to rewrite old source code as per the latest coding standards. Moreover, you can use AI for creating unit and integration tests. The possibilities are endless with AI, and the technology world will shake aggressively in the upcoming months.

Regulations

Generative AI technology comes with several restrictions. In recent times, there have been serious concerns about the misuse of Generative AI tools for cybercrimes, including fake news and deepfakes. It's to be noted that companies can't release AI software products without adhering to the laws of the country. You should note that companies like OpenAI, Google, and Meta have signed an agreement with the US government in July 2023. The purpose of this agreement is to watermark AI-enabled content. The US Executive Order 14110 signed in October 2023 stipulates all companies based in the United States to report while training large AI models. This move was done after amending the Defense Production Act. The Artificial Intelligence Act drafted by the European Union mandates disclosure of copyrighted material used for training Generative AI chatbots. Moreover, companies should specifically label the AI-generated response.

Sometimes, Generative AI chatbots act in a biased manner, forcing companies to take corrective steps. Google recently apologized after Gemini threw inaccuracies in historical image generation depictions. The company was also forced to disable image generation with faces because of inconsistent rendering. The recent social media outage over Meta AI rendering responses in a biased format is a classic example of AI behavior. The respective companies should invest additional time to eradicate bias from the output. It's to be noted that several newspaper companies have sued OpenAI and Microsoft because of copyright infringements.

There are also reports that the UK is also moving ahead to regulate AI after the AI Safety Summit held at Bletchley Park in November 2023. The participants expressed deep anguish over the risks and harms due to misuse of data. The Interim Measures for the Management of Generative AI Services is formed to regulate any user-specific Generative AI in China. The Cyberspace Administration of China intends to create a secure AI environment. This includes watermarking generated images and videos,

including restrictions on personal data collection. Interestingly, Generative AI chatbots like ChatGPT and Google Gemini are banned in China because of safety concerns.

Even though India hasn't passed any laws to regulate AI, the government has made it clear that violations will be dealt with strictly as per the existing IT laws. OpenAI, the company behind the development of ChatGPT, recently revealed how an Israeli-based company used its platform to influence the Indian general elections held in 2024 in the form of comments, tweets, and articles. There are concerns about Generative AI replacing human jobs because the systems can quickly generate and rewrite content easily.

Imparting Proper Training

Generative AI tools such as ChatGPT, Copilot, and Gemini are trained on large and publicly available datasets. These include works that are copyrighted. That's why chatbots reveal the source from where the content is fetched below each response. For example, Copilot displays the relevant source(s) after the display of the output. There were instances where AI-based image generators produced images that were identical to the copyrighted images. Google recently discontinued the generation of images with human faces in Gemini after a series of complaints regarding the generated images. Getty Images has sued Stability AI because of the usage of its images to train Stable Diffusion. The Authors Guild and *The New York Times* have also filed lawsuits against Microsoft and OpenAI over the usage of their articles and blogs to train Copilot and ChatGPT.

Evolution of GPTs

Generative pre-trained transformer (GPT) is a popular Large Language Model (LLM) that is employed in the Generative AI tools such as ChatGPT, Copilot, and Gemini. OpenAI is the company behind the development of GPTs. They are used in natural language processing tasks via artificial neural networks. GPTs are trained on language datasets of text that can generate quality content based on the relevant query, which is otherwise called a prompt.

The evolution of GPT dates back to 2018 with the launch of the first iteration, which is named GPT-1. The model comprised a 12-level and 12-headed transformer decoder followed by linear softmax. The initial version of GPT-2 was launched on February 14, 2019, with modified normalization and 1.5 billion parameter count followed by the full version on November 5, 2019.

The higher scalable GPT-3 based on GPT-2 was launched on May 28, 2020, with 175 billion parameter count followed by GPT-3.5 on March 15, 2022. Microsoft initially launched Copilot based on the GPT-3 model and subsequently switched over to GPT-4.

The advanced GPT-4 with 1.7 trillion parameter count was released on March 14, 2023, with support for both text and images as input. OpenAI launched GPT-4 Turbo in November 2023 as a multimodal model capable of processing both text and image inputs. The model is packed with extensive data, which is capable of providing accurate current information.

OpenAI announced the release of GPT-4o, also called GPT-4 Omni, on May 13, 2024, with support for text, image, and audio prompts. GPT-4o is available for ChatGPT free users in limited access mode in addition to the GPT-4o mini model. Meanwhile, ChatGPT Plus subscribers have access to GPT-4o, GPT-4o mini, GPT-4 models with support for advanced data analysis and DALL·E image generation.

Note Microsoft recently announced that GPT-4o will be integrated into Copilot in the upcoming future. The team also demonstrated the capabilities by using the *Minecraft* game with the GPT-4o model.

OpenAI is expected to release GPT-5 by Q4 2025 with PhD-level intelligence. The upcoming model will be developed to achieve human-level performance with advanced memory and reasoning functionalities. Microsoft revealed the latest version of its Small Language Model (SLM) named Phi-3.5 on August 20, 2024. The AI models and related technologies are under continuous development. You can expect the launch of several new AI models and chatbots regularly, as the field is evolving rapidly. The future is bright for AI, and it's up to you to use it responsibly.

Evolution of Chatbots

OpenAI's ChatGPT leverages its own GPT model to generate responses. The free version provides support for GPT-3.5 with limited access to GPT-4o, file uploads, custom GPTs, and much more. Microsoft borrowed OpenAI's GPT language model and integrated it with Copilot, which is available in Windows 11, Microsoft Edge, Skype, and the Web. The company also released a Copilot Windows app that can be pinned to the Taskbar, including access via Windows 11 desktop and Start menu. Microsoft also launched an exclusive graphics app named Microsoft Designer based on Generative AI. Google's Gemini AI has been integrated with the language model named PaLM. This model has been designed, developed, and trained by Google and accepts both text and image prompts.

Meta also released its own LLM named LLaMA with Facebook, WhatsApp, and Instagram integration. The access is limited to certain countries. However, Meta AI is currently available on WhatsApp in India. X (formerly Twitter) also released an exclusive Generative AI model named Grok. LumaLabs recently launched Dream Machine, which is a Generative

AI model for the creation of high-quality videos from text and images. The service is available for free with a limit of five shots per day with an enhanced limit for paid users. Imagine you are interacting with ChatGPT, Copilot, or Gemini. This means that you are communicating with chatbots. Table 1-1 provides a quick glance of the evolution of the popular chatbots.

Table 1-1. *Learn the Evolution of Generative AI Chatbots*

Chatbot	Company	Launch Date	Technologies	URL
ChatGPT	OpenAI	Nov 30, 2022	GPT-3.5/4/Turbo/ 4o/4o mini	chatgpt.com
Bing Chat	Microsoft	Feb 7, 2023	GPT-3/4	Renamed as Copilot
Copilot	Microsoft	Sep 21, 2023	GPT-4/Turbo/GPT-4o	copilot.microsoft.com
Bard	Google	March 21, 2023	PaLM 2	Renamed as Gemini
Gemini	Google	Feb 20, 2024	Gemini	gemini.google.com
Grok	X	Nov 4, 2023	Python/Rust	x.com

Evolution of Microsoft Copilot

We all worked even before the launch of Microsoft Copilot, which is a Generative AI chatbot. We worked aggressively during the pandemic times even without Copilot. We never heard about technologies such as ChatGPT, Copilot, Gemini, and Gork during those times. Let's trace back as to how we worked. We often open a web browser such as Microsoft Edge or Google Chrome and navigate to search engines like Bing, Google, Yahoo, and much more. If you had worked online during the late 1990s, you would have worked with Yahoo, Lycos, and Altavista search engines. The process works like this: you input a query into the search box, and the relevant search engine throws the result. Let's check in Figure 1-1 as to how the result of a traditional search engine appears on your desktop.

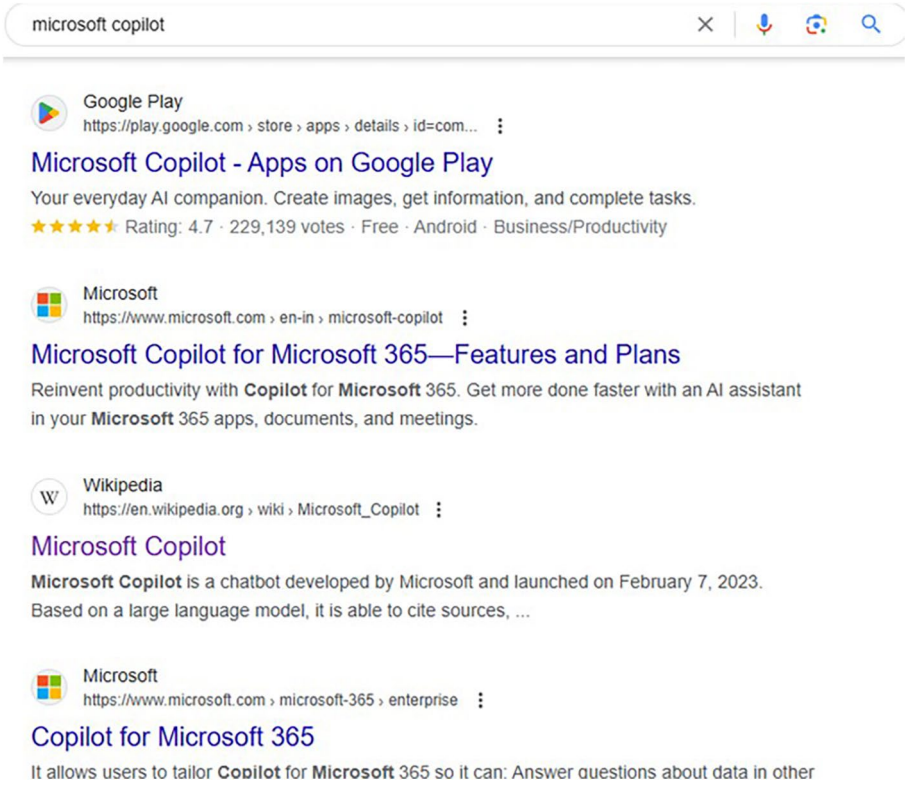

Figure 1-1. *This is how a traditional non-AI search engine displays the result*

As you can see, the search engine provides the results with the title, description, and URL. You have to manually visit each search result, and the whole process should be repeated until you find a specific answer relevant to your query. The search results rendered through web browsers are paginated. This means you have to select each page manually to locate the relevant information. Sometimes, you will have to select several pages and then manually click the links to locate a piece of specific information. You only had search engines at your disposal. It's still a credible tool because the system provides links from reputed sources that are ranked according to the popularity of the domain. You just need to open the link

and read the content, which will be supported by images and videos. You can also select the internal links from the displayed web pages to locate additional resources.

Even though Microsoft's Bing exists, Google dominates the search engine space because publishers often produce content in such a way as to rank them better on Google only. Sometimes, web pages rank higher on Bing than Google. It all depends upon the algorithm adopted by the search engines. Both Google and Microsoft keep on changing the algorithm that affects the display of your content. Google's Panda update was notorious because web pages ranked higher before the rollout of the update drastically went down in the overall search rankings. This will not only affect the traffic but also the overall revenue of publishers.

History

Microsoft established a strategic partnership with OpenAI in 2019 and started to infuse funds. As part of the deal, OpenAI systems are being run on the Microsoft Azure cloud platform. Microsoft revealed in September 2020 that it had licensed OpenAI's GPT-3 technology. Even though other users can receive output from its public API, Microsoft will only have access to the underlying language model. OpenAI created an Internet sensation in November 2022 with the launch of GPT-3-enabled ChatGPT chatbot. The system was primarily designed to deliver information based on prompts. The whole system gained worldwide attention with users storming into ChatGPT. A major development happened on January 23, 2023, when Microsoft announced a $10 billion investment in OpenAI.

Origin of Bing Chat

Just days after the massive investment in OpenAI, Microsoft Copilot (originally named Bing Chat) was launched on February 7, 2023. Bing Chat was designed based on the GPT-3 language model but was upgraded to the

GPT-4 language model. The system generated answers based on queries by citing sources. Bing Chat was able to deliver short/long essays based on the tone, create poems, perform calculations, and much more. Microsoft renamed Bing Chat as Copilot in late 2023 to provide uniformity across Microsoft AI products like GitHub Copilot.

Microsoft continues to add new features and capabilities to Copilot. The chatbot was expanded with support for plugins. For example, Microsoft Copilot provides the capability to generate songs via the Suno AI plugin. Copilot can be considered as an advanced replacement for Cortana, which has been discontinued by Microsoft.

Bing Chat was initially launched as an integrated feature for the Bing web browser and Microsoft Edge. Microsoft embedded Copilot into Windows 11 during the sidelines of the Microsoft Build conference. You can easily launch Copilot in Windows 11 directly from the Taskbar. Microsoft announced the addition of a dedicated Copilot key for Windows devices in January 2024. This is a major development in the quest to tag Windows 11 devices as AI enabled.

Even though Microsoft Copilot was launched based on the GPT-3 model, the system currently makes use of the GPT-4 language model based on Microsoft Prometheus. Copilot Pro subscribers have access to the advanced GPT-4 Turbo model. The system has been fine-tuned with not only supervised but also reinforcement learning techniques. The Microsoft Copilot dashboard looks similar to ChatGPT, but you can specify the output tone. Moreover, Copilot displays sources from where the output is being fetched. The interactions with Copilot are saved just like ChatGPT. Microsoft Copilot is designed in such a way that it can communicate with numerous languages and dialects.

The Bing AI chatbot was initially made available in waitlist mode to users of Microsoft Edge and Bing mobile apps. Microsoft revealed that one million people joined the Bing Chat waitlist within 48 hours of the official launch. The Bing Chat UI looked as shown in Figure 1-2.

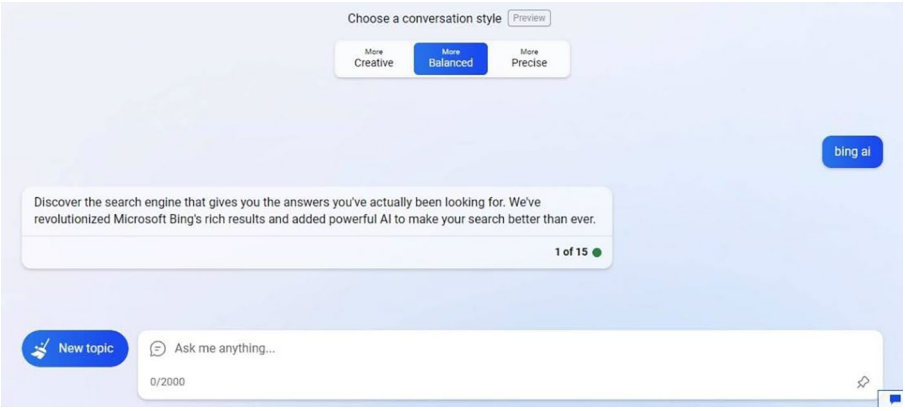

Figure 1-2. *Bing Chat user interface*

Microsoft restricted the chat session to 5 with a limit of 50 queries per day per user. The company relaxed the restrictions to 30 chat sessions and 300 queries per day. These restrictions helped the company to balance the server load and also to provide quick replies. Microsoft eliminated the waitlist requirement and migrated the AI chatbot to Open Preview on May 4, 2023. Bing Chat was made available for consumption on non-Edge web browsers such as Google Chrome, Firefox, and others on August 4, 2023. Microsoft Copilot is available for free just like search engines. With the help of the free version, you can access several features including the ability to create songs and images. The image creation does come up with restrictions in the form of tokens for Copilot Free users, while the Pro subscribers have 100 tokens per day. The system generates images via OpenAI's DALL·E technology using powerful algorithms.

Image Creator

Microsoft released Bing Image Creator (currently Image Creator) powered by OpenAI's DALL·E 2 technology in March 2023. The system was designed to generate rich and compelling images based on the provided prompt.