Chapter 2

Progressing from Turing to Deep Learning

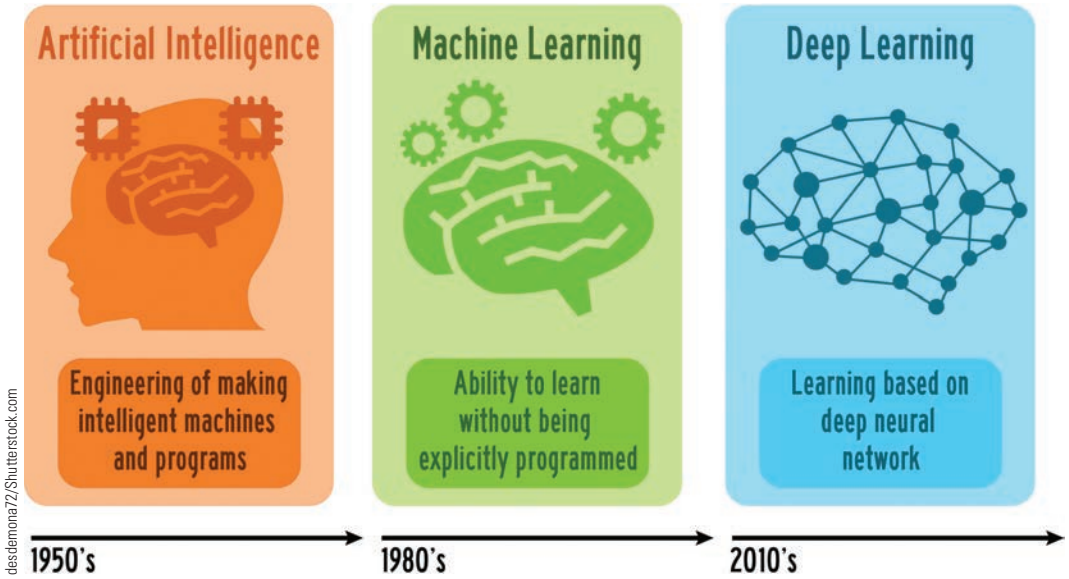
Learning Objectives

After completing this chapter, you will be able to:

- **2.1** Trace the evolution of AI beginnings to practical applications.
- **2.2** Compare the relationship between the Turing test and machine intelligence.
- **2.3** Identify the applications of machine learning.
- **2.4** Highlight the potential applications of deep learning.
- **2.5** Use Microsoft Copilot's AI capabilities to generate creative text formats within a Word document.
- **2.6** Generate slide content using PowerPoint Copilot.
- **2.7** Explain how AI is transforming different aspects of business operations, including chatbots, marketing, and security.

AI (artificial intelligence) at its core is simply software running on a computer. What makes it different is that, unlike other computer software, AI software keeps learning. As it continues to learn, it gets better at what it does. AI's journey begins in the 1950s, when scientists built the first computers and wondered if they could teach them to think like people (**Figure 2-1**). Back then, AI was like a basic calculator following simple instructions. Before computers, scientists and engineers would do complex calculations by hand, which took forever. Early computers could handle these calculations much more quickly, making them ideal for tasks like designing airplanes or predicting weather patterns. During World War II, some of the first computers were built to help crack enemy codes. In the 1950s, this skill continued to be important for governments to keep their information safe. The AI timeline extends beyond these past events and into the future; it is crucial to identify connections between earlier developments and current innovations while looking toward future opportunities that AI may bring.

Figure 2-1: From Turing to deep learning



2.1 Tracing the Evolution of AI

By tracing the history of AI, you can better understand its current state and potential future directions. In the 1950s, computing machines mainly acted as large basic calculators. In fact, when NASA (National Aeronautics and Space Administration) needed solutions to complex calculations, like rocket launch paths to space, they often relied on human computers, groups of women who solved those hard math problems, as featured in the movie *Hidden Figures*. The 1950s advanced the need for more complex calculations and for machines to begin to think more like humans. Driven by the innovations of forward-thinking scientists and advancements in computer speed and capacity, AI has evolved from a science fiction concept to a powerful force with significant impact on today's world.

Each decade since then brought new ideas and approaches to move AI forward. As computer hardware and Internet capabilities improved, AI researchers overcame technology challenges and advanced its abilities. **Table 2-1** summarizes each decade starting in the 1950s to provide a big picture of how AI has progressed.

Table 2-1: AI progressing through decades

Decade	Key inventions and progress
1950s	The Turing test, proposed by Alan Turing
1960s	Perceptron, a simple artificial neural network with machine learning, followed by the AI winter (a period with a sudden drop in interest and funding for AI research as well as limitations in technology)
1970s	Rise of logic programming languages like Prolog
1980s	Advancements in computer vision, natural language processing, and robotics
1990s	Improved speech recognition software and robots with increased autonomy
2000s	Early steps into deep learning
2010s	Deep learning revolution with advancements in computing power, big data, image recognition, and personalized shopping recommendations
2020s	Deep learning breakthroughs in fields from healthcare to self-driving cars; the invention of OpenAI's ChatGPT and millions of AI apps

2.1 | Two Rights & a Wrong

Read the following three statements and then identify the incorrect one.

1. One of the key features of AI is its ability to keep learning and improving.
2. The beginning of AI can be traced to the 1990s with the introduction of the Internet.
3. Each decade since the 1950s brought new ideas and approaches to move AI forward.

Answers at end of chapter

2.2 Connecting the Turing Test and Intelligence

Understanding each decade's major contributions helps us connect the dots to identify today's huge advancements in AI. The birth of the AI field starts in 1956 at the Dartmouth College Summer Workshop (**Figure 2-2**), where a group of creative thinkers including John McCarthy, Marvin Minsky, Allen Newell, and Herbert Simon laid the foundation for the field of AI. They began to brainstorm about proposed machines capable of solving problems and even exhibiting human-like learning. This era saw the rise of symbolic AI, where researchers focused on programming machines with explicit rules and logic to mimic intelligent behavior. These rules would later be called code and lead to today's AI explosion.

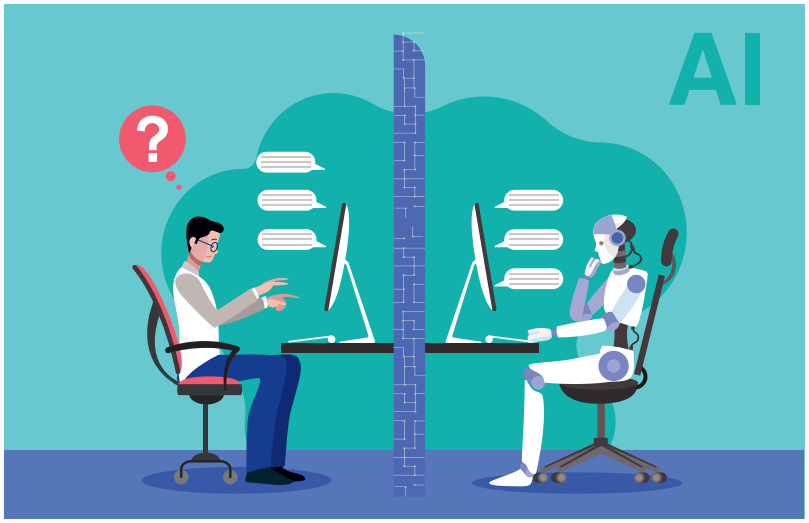
A key idea that emerged from Dartmouth Workshop discussions was the **Turing test**, proposed by Alan Turing in his 1950 paper "Computing Machinery and Intelligence." The Turing test suggested that a machine could be considered intelligent if it could hold a conversation indistinguishable from one with a human (**Figure 2-3**). This idea provided a benchmark for evaluating progress in AI and fueled research into natural language processing and human–computer interaction.

Alan Turing was a British mathematician who worked at Bletchley Park, a facility established in England during World War II to break German secret cyphers. He created the Turing test, originally called the imitation game, stating that a machine was intelligent if it could converse like a human. The Turing test is a set of guidelines meant to determine if a computer can truly think like a human.

Figure 2-2: Dartmouth College Summer Workshop

Jon Bilous/Shutterstock.com

Figure 2-3: Robot and human facing the Turing test



Jesus Sanz/Shutterstock.com

Figure 2-4: The Turing test imitating human conversation

DC Studio/Shutterstock.com

In the Turing test, someone who serves as a judge chats with both a person and a computer program. Imagine you are in a room with a wall dividing it in half. You are on one side, and two doors are on the other side. Behind one door is a person, and behind the other is a computer (or a robot) as in **Figure 2-3**. You do not know who is behind either door, but you can chat with them by typing messages back and forth. Your job is to figure out which is the human and which is the computer. You can ask them anything you want, like their favorite song or their plans for the weekend. By the way they answer your questions and chat with you, you should be able to tell the difference between a human and a machine, right? If you cannot tell the difference between them based on their conversation, then the computer program is considered to have passed the Turing test (**Figure 2-4**). This test shows that the computer is very good at imitating human conversation.

Turing's research, which resulted in the creation of the code-breaking machine at Bletchley Park (**Figure 2-5**), was a significant technological breakthrough and played a crucial role in the Allied victory in World War II. Although the Turing test did not play a role in the code-breaking machines of World War II, nevertheless it and the introduction of the first digital computers helped advance the study of AI.

Do AI engines like ChatGPT pass the Turing test today? AI has undoubtedly improved in handling conversations. Large language models like ChatGPT can hold conversations that are witty, informative, and even emotional at times. There have been claims of AI passing the Turing test, but these are often debated. The general consensus is that while AI is getting pretty good at conversation, it is doubtful that AI has achieved true human-level understanding.

The Turing test has some basic limitations. It focuses on imitation rather than true understanding. A machine can trick you by mimicking human conversation patterns without actually possessing human-like intelligence. AI can still miss the moral judgments and situational complexities needed to make truly sound decisions. AI excels at handling factual data and conversation patterns but struggles with understanding human emotions and making ethical judgments.

In the 1950s, Turing lacked the technology to prove his theory because computing machines had not advanced to that point. Turing is credited with pioneering artificial intelligence before it came to be called by that term. His imitation game is still used today.

Figure 2-5: The Turing code-breaking machine at Bletchley Park

AmbrosiniV/Shutterstock.com

2.2 | Two Rights & a Wrong

Read the following three statements and then identify the incorrect one.

1. The Turing test suggested that a machine could be considered intelligent if it could hold a conversation indistinguishable from one with a human.
2. If a person cannot tell the difference between a computer program and a person based on their conversation, then the computer program is considered to have passed the Turing test.
3. Today's AI has shown that it can pass the Turning test.

Answers at end of chapter

2.3 Applying Machine Learning Innovations

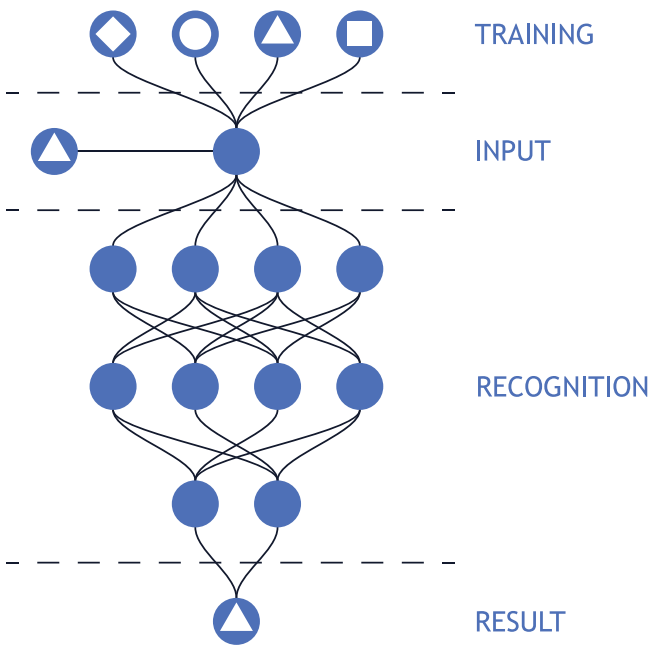
The imitation game was more comprehensively developed in the early 1960s. Arthur Samuel, a computer scientist at IBM, coined the term **machine learning (ML)**. ML is a way for computers to learn to recognize patterns from many examples and to make decisions, without being directly programmed with specific rules for every decision. Samuel's work focused on a computer program that played checkers (**Figure 2-6**), a simple game, yet one that requires strategy and a response to counter another player's move on the checkerboard. Each time the computer played checkers, it learned from its previous games to improve during the next game. This is the first time that a computer evaluated its past wins and losses to learn with ML.

Samuel's work coincided with another step in the rise of ML. Frank Rosenblatt, a New York research psychologist studying the brain, invented a machine that could model learning like humans do. He created the **perceptron**, inspired by the structure of the human brain, as a basic model for an artificial neuron. This neuron received information and carried the information to the perceptron, which acted as a filter that separated things into two categories. The perceptron is like a sorter at a plant that recycles not paper or plastics, but information. In a way, the perceptron is a simplified model of a biological neuron. It receives information, processes it to determine what it is, and makes a decision based on a predefined model (like deciding between paper or plastic). In **Figure 2-7**, the computer is trained to evaluate the different criteria to determine how to sort the input. The input comes into the computer, which then tests the criteria to recognize the object and then displays it as the result. The perceptron can even learn from its mistakes. If it keeps misclassifying paper and plastics, it learns from its errors and gets better at sorting things correctly. Although the perceptron was somewhat basic, it did pave the way to use these neurons in a more

Figure 2-6: Machine learning through the game of checkers

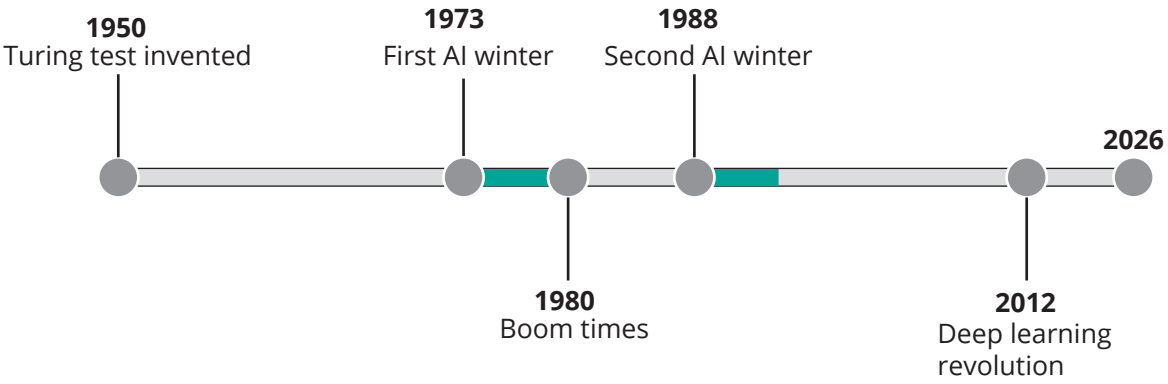
Stas Malyarevsky/Shutterstock.com

Figure 2-7: Perceptron, like the human brain, classifies data into categories



all_is_magic/Shutterstock.com

Figure 2-8: AI winter timeline



complex neural network. By the end of the 1960s, people were excited about where all this research would lead.

AI Winter

AI development has had its ups and downs. In the 1970s, the technology could not really support all the early ideas to turn the research into reality because computers were still basic, large, and expensive. Only very large organizations, not homes, had computers. Computer coding languages such as COBOL had been developed for businesses like banks, but there were no significant breakthroughs in the field of AI. The term **AI winter** (**Figure 2-8**) refers to a period of reduced funding, interest, and progress in the field of AI. During the 1970s, interest and excitement about AI waned, and programs suffered funding cuts when disappointment surrounding AI research set in. AI research did not halt entirely during the AI winter, but it did cause researchers to pause and reevaluate their direction. As researchers tried tackling more complex problems, they realized their technology was not powerful enough. A second AI winter occurred around 1988.

Computer Vision

The AI winter of the 1970s put a damper on progress, but it was not a permanent freeze. The 1980s and 1990s were a vibrant time for technology. From bulky beige desktop computers to laptops, and to the rise of the Internet, significant advancements paved the way for today's AI (**Figure 2-9**). Researchers could begin to experiment with complex AI topics that simply would not work on the slower machines of the past. The amount of digital data available also started to explode. With the rise of personal computers (PCs) and the early stages of

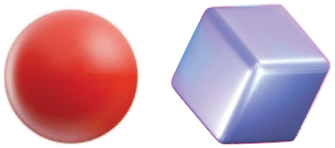
Figure 2-9: Computers in the 1980s and 1990s

Vallabh Soni/Shutterstock.com

the Internet, researchers could access more text, images, and other information to train their systems. Instead of trying to build a general AI computer that could do everything, researchers started focusing on specific tasks.

Researchers began to teach computers to see. **Computer vision (CV)** is a field of artificial intelligence that allows computers to perceive and understand the world around them, just like a human, using cameras, data, and algorithms to replicate vision. In the 1980s and 1990s, when computer vision was still in its early stages, CV systems could identify basic objects in controlled settings. As an example, think of a program that can tell the difference between a red ball and a blue cube on a clean table (**Figure 2-10**). Computers were getting better at figuring out where things began and ended in an image, such as the curved edge of a ball and the corner of a cube. This was crucial for recognizing the outlines of objects and their relative positions. Imagine a program that can identify basic shapes by tracing their edges. However, cameras of the time did not have very high resolution, which made it difficult for computers to capture the fine details crucial for accurate recognition.

Figure 2-10: Early computer vision could determine shapes and colors



Sabelskaya/Shutterstock.com; Evgenia Vasileva/Shutterstock.com

Natural Language Processing

The 1980s also laid the groundwork for today's AI revolution in computers that could understand human speech. In this decade, a specific area of AI called natural language processing (NLP) focused on listening to basic spoken words and reading typed text to interpret their meaning, but this beginning was a long way from understanding complete conversations in all the world's languages. Early NLP systems relied heavily on a technique called **keyword spotting** (**Figure 2-11**), which detects keywords or phrases used in audio recordings and typed text. It's like entering text in a search engine such as Google. If your question contains specific words that match exact predetermined coded responses, the computer might be able to find a result. However, if your recorded phrase or text deviates even slightly from the known list of words, the NLP would be lost. This early development of NLP would one day be used in advanced AI systems such as today's voice assistants like Siri, Google, and Alexa that understand your spoken commands.

Figure 2-11: Early NLP used keyword spotting to detect basic phrases

Stokkete/Shutterstock.com

Early Robotics

The term robot is over 100 years old. It was first mentioned in a play written in 1920 by Karel Čapek named *Rossum's Universal Robots*. The play was about fictional human-like machines that assisted in doing work. Before the 1980s, some factories used automated machines for repetitive tasks, such as automatic looms that could weave fabric or conveyor belts that moved materials around. These were not really modern robots in the traditional sense, but they established the groundwork for the more sophisticated robots of the future.

Early AI-enabled robots in the 1980s and 1990s had simple sensors that could feel tactile sensations and measure distance to objects. This enabled the first robots to engage with their surroundings in a limited fashion, such as a robot arm with a sensor that could stop its movement upon encountering an obstacle. Some robots began to include cameras that could perform basic image-recognition tasks, like identifying different parts on an assembly line. On a vehicle assembly line, a robotic arm with a camera could identify which make and model of a car was about to be painted in the paint booth (**Figure 2-12**).

Figure 2-12: A robotic arm painting a car

Jenson/Shutterstock.com

The goal was to recognize the car model and identify key features like the location of the windows and headlights on that model. Based on the information from the computer vision AI system, the robotic arm holding the paint gun could be programmed to adjust its movements slightly to fit the correct layout of that particular car model. This allowed the robot to paint around the car's body features without someone manually masking the car with tape over the windows and headlights, which saved time and money. This example demonstrates the advancements made in early AI robotics, even with low-resolution cameras, that managed to increase productivity in industrial applications like painting a car.

2.3 | Two Rights & a Wrong

Read the following three statements and then identify the incorrect one.

1. Like the Turing test, machine learning (ML) is considered only a theory that cannot be implemented.
2. Perceptron is inspired by the structure of the human brain.
3. The term AI winter refers to a period of reduced funding, interest, and progress in the field.

Answers at end of chapter

2.4 Illustrating Deep Learning

One of the most exciting applications of generative AI was the creation of deep learning models in the early 2000s that began a new era of AI with faster computer power. **Deep learning** is a type of machine learning that teaches computers to handle data in a way that resembles human brain functions. Typically, deep learning includes the following three layers. Very complex AI systems can have more than three layers.

- **Input layer:** The first layer of deep learning is the input layer where data is entered. For example, an image could be uploaded to the Google search engine so that the image can be described.
- **Hidden layer:** The second layer is called the hidden layer where the input is processed. If an image was uploaded into Google's search engine, during this layer, deep learning would determine what the image looks like or find similar images on the web.
- **Output layer:** The third layer of deep learning is called the output layer and displays the final product. The computer might describe the image that was uploaded as displaying a partial solar eclipse (**Figure 2-13**).

In many ways, you use deep learning when you study and learn in a college course. You read all the information in your book and listen in class. You then practice a given task with that data repeatedly by completing your assignments and taking practice tests, improving your score each time. Lastly, you prove that you understand the material by completing a

project or taking a test. Deep learning is like human learning, continuously practicing and improving the AI's skills.

In previous years, as computers became faster and more powerful, researchers trained complex neural networks with massive amounts of data such as text, images, and videos. Early deep learning models advanced the field of image recognition. Imagine showing a computer thousands of pictures of every type of bear. Deep learning models became remarkably good at distinguishing between them, determining whether a bear was a polar bear, a brown bear, or another type of bear (**Figure 2-14**). This massive amount of information that was fed to the computers is often called **big data**. Big data is a crucial requirement for deep learning from data that includes social media posts and images, robotic sensors that collect data about smart homes and smart cities, financial information, and even medical details.

This advanced image recognition capability paved the way for applications like facial recognition in photos and navigation for self-driving cars. Deep learning's impact in the 2000s and 2010s influenced many career pathways (**Table 2-2**).

In the mid-2010s, two advances—one in hardware and one in software—helped propel AI to the next level. Hardware graphics processing units (GPUs) were originally developed to support the processing required for rendering images in computer games. However, GPUs

Figure 2-13: Google identifies an uploaded image as a solar eclipse

John Fader/Shutterstock.com

Figure 2-14: Using deep learning models to determine a type of bear

Achmad Yuge/Shutterstock.com

Table 2-2: Impact of deep learning

Deep learning technology	Field	Deep learning impact
Speech recognition	Human–computer interaction	Boosted the accuracy of speech-to-text software and made early voice assistants like Siri more reliable in understanding spoken instructions
Machine translation	Language translation	Broke down language barriers and improved communication across countries and cultures
Spam filtering	Email management	Reduced unwanted spam and junk email and improved the user experience to save time
Medical diagnosis	Healthcare	Aided doctors in analyzing medical images like X-rays and MRIs. Machine learning is now helping scientists and other medical professionals use the human genome, which consists of approximately three billion DNA base pairs of chromosomes, to create personalized medicines and diagnose tumors.
Retail shopping and personal preferences	E-commerce and entertainment	Revolutionized recommendation systems for online stores and streaming services
Fraud detection	Financial services	Improved the ability to detect fraudulent activities like credit card scams
Stock market	Financial services	Explored the potential for predicting stock market trends
Game development	Video games and virtual reality	Created more realistic and challenging AI opponents in video games and virtual reality

can also be used to carry out similar computations in parallel on large datasets, which was a key breakthrough for training neural networks. GPUs turned out to be ideally suited to the computational challenges of training AI neural networks. GPU chips are now in such high demand for AI that a single high-performance GPU can sell for over $50,000 and is delivered in an armored car.

A second development was a breakthrough in how neural networks can be expanded through new models of architecture. Instead of relying on what was called "recurrence," these new models depend on an "attention mechanism" to develop the dependencies in the data. These two advances opened the floodgates of investments by businesses, governments, and universities that led to today's boom in AI.

2.4 | Two Rights & a Wrong

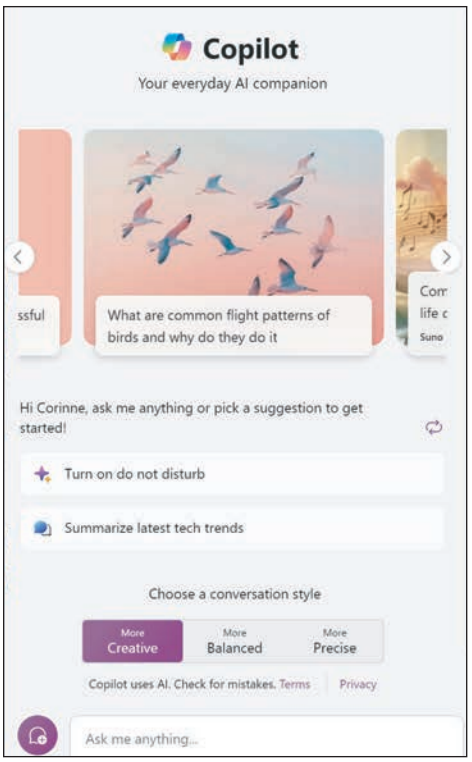
Read the following three statements and then identify the incorrect one.

1. Deep learning is a type of machine learning that teaches computers to handle data in a way that resembles human brain functions.
2. Big data is a crucial requirement for deep learning and includes data such as social media posts and images.
3. It is anticipated that deep learning will play a role in virtual reality in the distant future, but that remains uncertain.

Answers at end of chapter

2.5 Using Deep Learning in Microsoft Office with Copilot

Figure 2-15: Windows displaying the Copilot pane as a virtual assistant

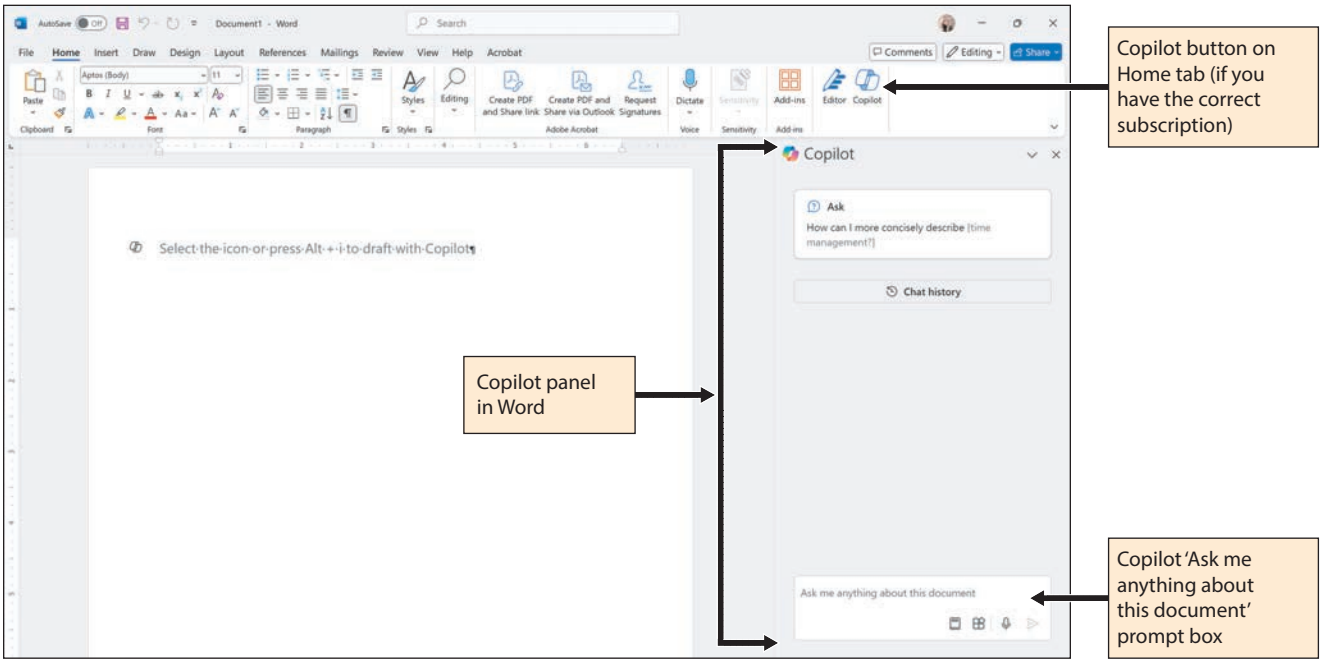


Currently, machine learning, deep learning, and other AI technologies continue to evolve in a multitude of technology apps. An example of AI in action is Copilot for Microsoft 365, which is fueled by deep learning technologies. Microsoft 365 is a productivity tool that integrates with Microsoft Office applications such as Word, Excel, PowerPoint, Outlook, SharePoint, and Teams. A recent addition to Microsoft 365, Copilot is a subscription service that uses AI to enhance productivity within the applications in the Office suite. Ask your instructor if your school has access to Microsoft 365 with Copilot. With a subscription, you can use Copilot in Word Online, Windows, Mac, and iPad apps.

With Copilot in Microsoft Word, you can compose a document much more quickly than you normally would. It can even help with research right within the Word app. Copilot acts like a virtual assistant to help you with your work in several ways throughout the Microsoft 365 suite of apps, such as the Microsoft Edge browser and newer Windows operating systems (**Figure 2-15**), where a Copilot button appears on the taskbar by default. The free version of Copilot in Edge and Windows provides fundamental AI assistance, such as summarizing webpages, generating text, and answering questions. Copilot in Office offers more advanced features, such as generating complex documents, analyzing data, and creating presentations; however, it requires a paid subscription.

In Microsoft Word, the Copilot tool is located on the Home tab. When you click the Copilot button, a pane is displayed with options to summarize

Figure 2-16: Microsoft Word 365 Copilot button and pane



the document you are writing or to ask a question about the document (**Figure 2-16**). In Microsoft Word, Copilot can check your grammar and suggest improvements to your writing, making your documents sound more polished and professional. Each time you ask Microsoft Copilot to assist in your document, Copilot considers the context and the details of your requested prompt and responds with a unique, creative response. This means it might choose different phrasing or change the style to use a more professional tone, for example, each time you use the same prompt. Even if you ask Copilot repeatedly to react to a certain prompt, you will receive different responses each time. You can refine your question or your prompt throughout your writing to target exactly the response that would work best in your document. Remember, Copilot, like all AI language models, can sometimes generate incorrect or misleading information. Always review and verify the output.

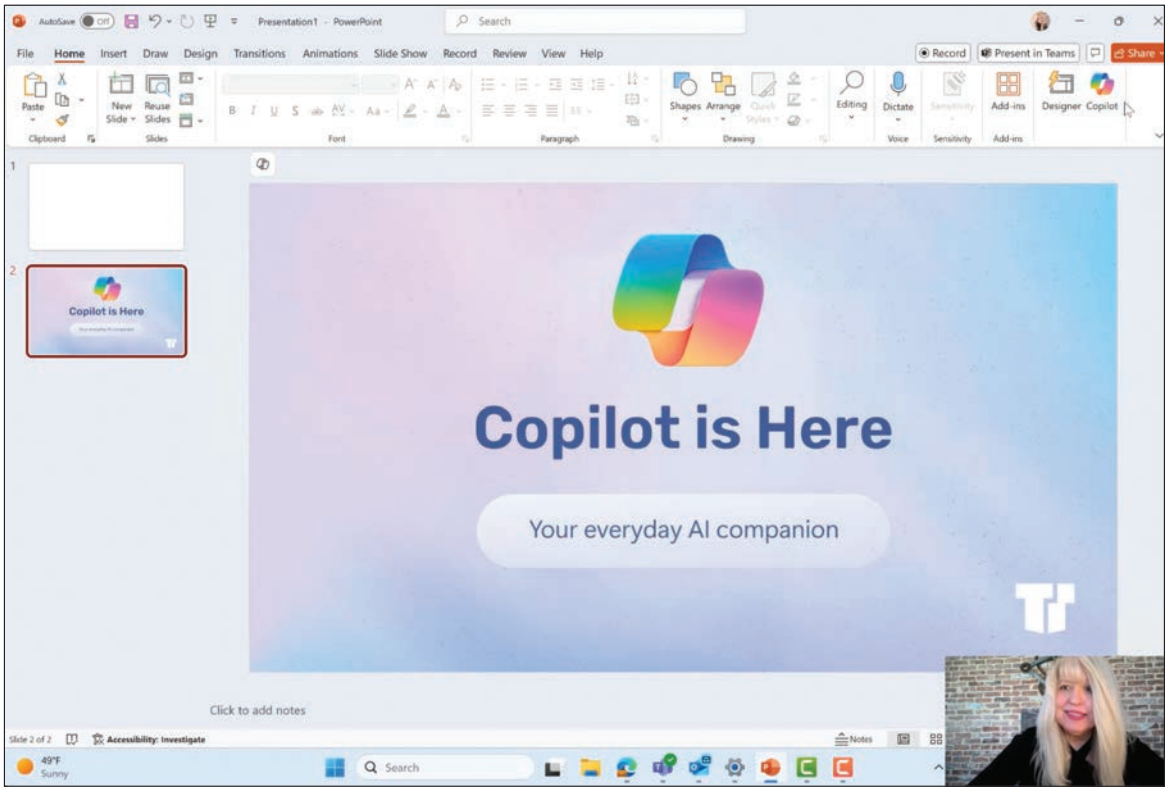
Using Word 365 with Copilot for a Startup Company Scenario

A local startup company called Urban Rooftop Gardens has the idea of setting up urban gardens on the rooftops of large apartment buildings throughout medium and large cities. One of the co-owners would like to create a brainstorming Word document using Copilot to generate some ideas to assist them in creating their business plan. Copilot can respond to prompts about the Urban Rooftop Gardens startup business to assist in the following tasks:

- **Brainstorm target audience:** Ask Copilot for help identifying the ideal customer profile. Consider factors like age, healthy eating, environmental interests, and living situation (such as apartments with rooftops or balconies).
- **Craft a compelling mission statement:** Work with Copilot to develop a clear and concise statement highlighting the benefits of the rooftop garden service. Focus on fresh local produce, reduced carbon footprint, and sense of community.
- **Create a motivational email:** Design an email that ignites customers' interest and encourages them to engage with the brand.

Prompt Along 2-1

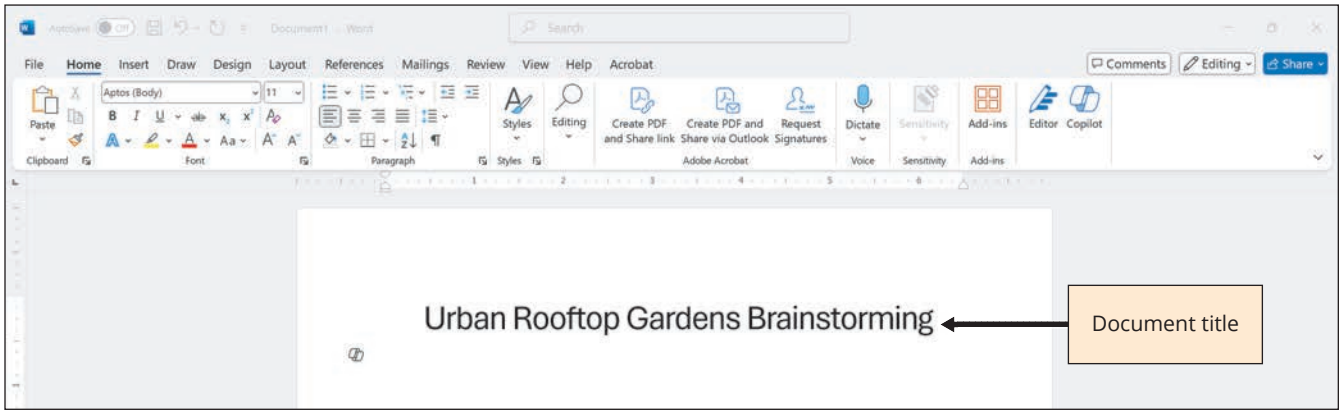
If you have access to Copilot through a Microsoft 365 subscription, complete the following steps. Otherwise, read the steps for Prompt Alongs 2-1 through 2-6 and examine the figures, but do not perform the steps. Play **Video 2-1** to experience Copilot in action.



To get started using Copilot in Microsoft Word 365:

1. If necessary, download and install Microsoft 365 through your school's link. Ask your instructor for this download link and to confirm if your school's installation of Microsoft 365 includes Copilot.
2. Open Microsoft Word and click Blank document to open a new document.
3. On the Home tab, click the Styles button and then click Title. Type **Urban Rooftop Gardens Brainstorming** as the document title. Click the Center button to center the title (**Figure 2-17**) and then press Enter to go to the next line.

Figure 2-17: Microsoft Word 365 document with title



Engineering AI Prompts in Copilot Chat

Microsoft Word 365 Copilot can shift how you brainstorm and create a rough draft of a document. As you type, Copilot can suggest relevant phrases, refine existing text, and even integrate files that you have already created as a resource. Whether you are drafting a mission statement, an article, or a business project proposal, Copilot can step in to assist you with being more creative and make your ideas move forward. Have you ever run into writer's block, where you find it difficult to get started? Copilot can serve as a way to brainstorm directly in a Word document in real time without leaving the application. Remember that you must review and tailor the generated rough draft content to align with your unique style and voice of your business.

Copilot AI prompts are your way of communicating to Copilot exactly what you need. Microsoft has analyzed the most effective prompts and recommends that your prompts contain the following four components: goal, context, expectations, and source (**Figure 2-18**).

Think of a Copilot AI prompt as a starting point, like a conversation starter in your document. Do you have a block of text that feels clunky? Select it and ask Copilot to "rewrite for clarity" or "sound more professional." By observing Copilot's refined suggestions, you can elevate your own writing style and learn to express ideas more professionally. Suppose you started a document and realize you want a catchy title. Type a simple prompt like "Generate a title for a business proposal about sustainability initiatives," and Copilot will offer creative options. **Table 2-3** lists more complex Copilot AI prompts to consider when using some of the four components of goal, context, expectations, and source (if appropriate) mentioned in **Figure 2-18**.

Figure 2-18: Copilot prompt components

Table 2-3: Advanced Copilot prompts

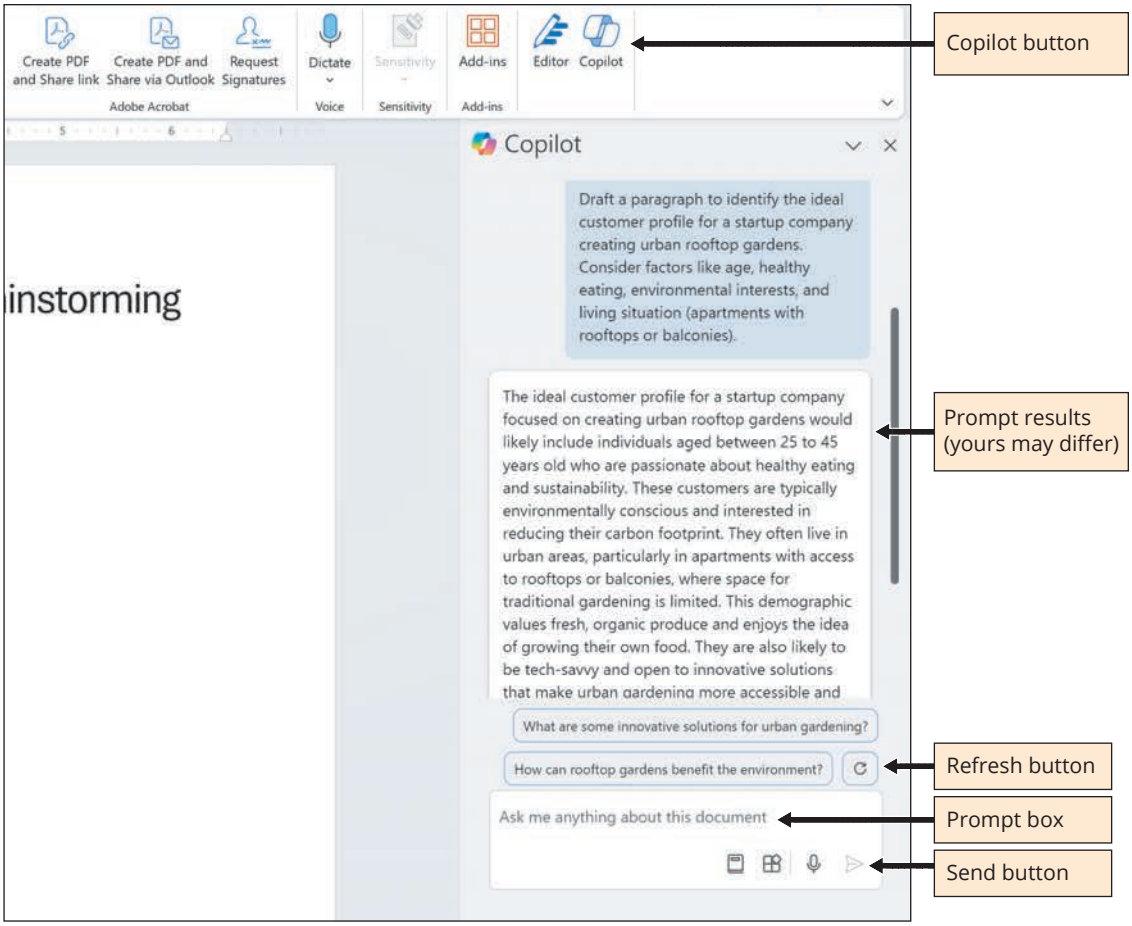
Type of business document	AI prompt for Copilot
Welcome letter to a new employee	Craft a warm welcome for a new employee (goal) who is joining the marketing team (context) that highlights the company's positive culture (expectations) and include details from our company website (source).
Meeting agenda: brainstorming session for local community fundraising	Generate a structured agenda for a brainstorming session (goal) on a community fundraising launch (context) and list key discussion points on fundraising activities within the company (expectations). Look at last year's agenda (source).
Social media post in hospitality: brand awareness	Draft a captivating social media post to increase brand awareness (goal) for a new country music-themed hostel in Nashville, TN (context). In a creative and eye-catching post, highlight Nashville activities and use relevant hashtags (expectations).
Sales script: cold calling for a cloud-based storage company	Develop a persuasive sales script for cold calling potential clients (goal) to offer a cloud-based accounting software solution for small businesses (context) with an engaging tone and content that identifies client pain points and presents the software's solutions effectively (expectations). Upload the market research on our customer base (source).

Prompt Along 2-2

To start brainstorming a draft about the target audience for the rooftop garden service using Copilot in Word:

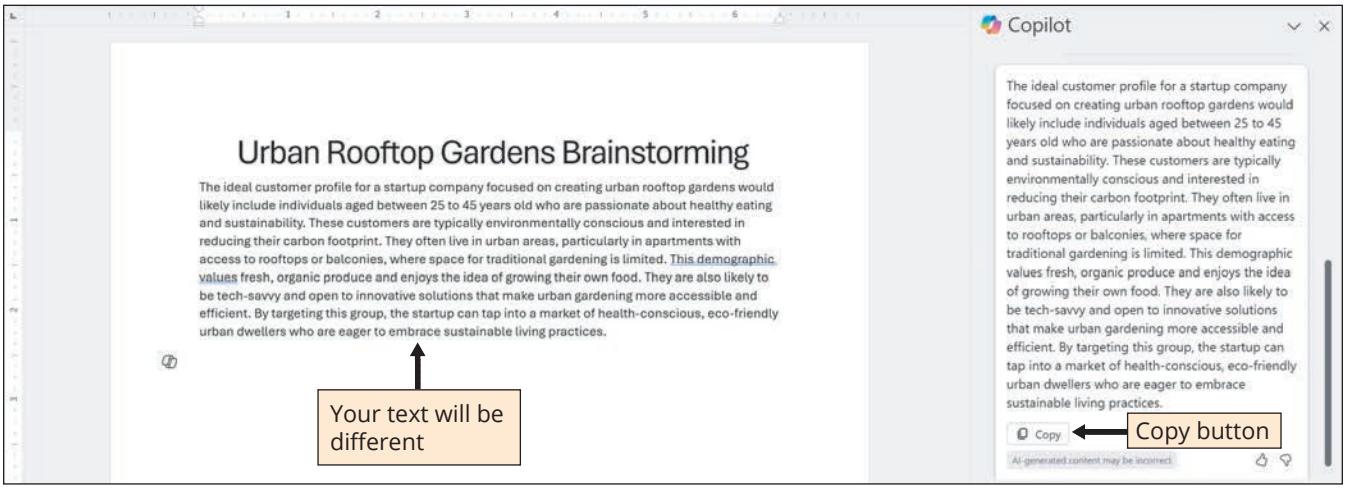
1. On the Home tab, click the Copilot tool (or press Alt+I) to display the Copilot pane. You must have a Copilot subscription within Microsoft 365 to use the Copilot tool.
2. In the Copilot pane, describe what you need to draft. Click the Ask me anything about this document box and type the following prompt: **Draft a paragraph to identify the ideal customer profile for a startup company creating urban rooftop gardens. Consider factors like age, healthy eating, environmental interests, and living situation (apartments with rooftops or balconies).**
3. Click the Send button (paper airplane icon). Copilot uses generative AI to produce a response paragraph (**Figure 2-19**). Each time Copilot generates content, the results will be different. Notice that Copilot creates more questions below the response to allow you to dig further into the topic.

Figure 2-19: Copilot pane displays an AI response



4. Scroll down in the Copilot response and click the Copy button in the Copilot pane to copy the AI-generated content to the Clipboard.
5. Click the blank line below the title and then click the Paste button on the Home tab in the Clipboard group to paste the generated content into the Word document to assist in your brainstorming ideas (**Figure 2-20**). Read the response and make changes in the wording to reflect your own voice.

Figure 2-20: AI response copied and customized within the Word document



Refining Your Writing with Copilot

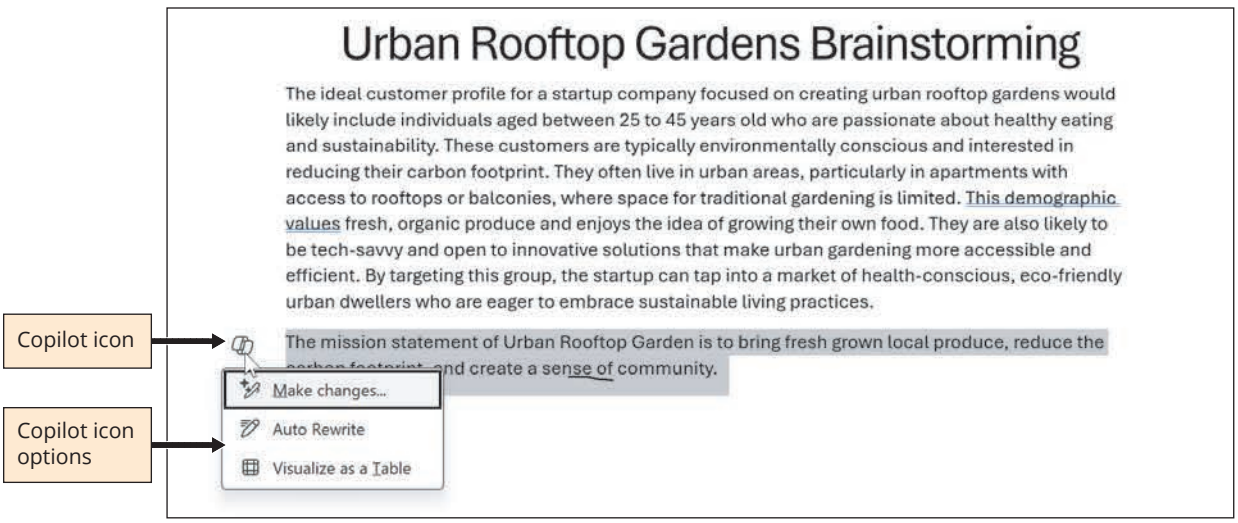
Not only can you generate AI brainstorming text responses from Copilot but you can also refine your own writing. Revising your documents can be more time consuming than thinking through your ideas initially. Whether you are creating a business plan, designing a meeting agenda, developing a marketing social media campaign, or developing a financial report in Word, Copilot can save time by analyzing your text and offering multiple rewrite suggestions. Copilot takes into account the surrounding text (the context) and the overall topic when generating suggestions.

Prompt Along 2-3

To rewrite your existing content using Copilot:

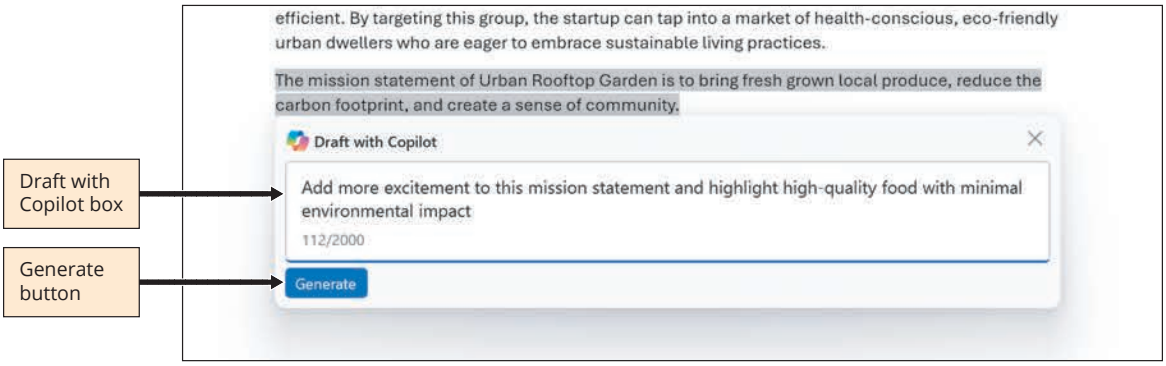
1. Close the Copilot pane. On the next line of the same Word document, type the following text: **The mission statement of Urban Rooftop Gardens is to bring fresh-grown local produce, reduce the carbon footprint, and create a sense of community.**
2. Select the typed sentence. In the left margin, click the Copilot icon (also called the Inspire Me button) to display a menu of options that includes Make changes, Auto Rewrite, and Visualize as a Table (**Figure 2-21**). You can also press Alt+I (for Inspire Me) to open the Draft with Copilot box.

Figure 2-21: Rewrite with Copilot icon options



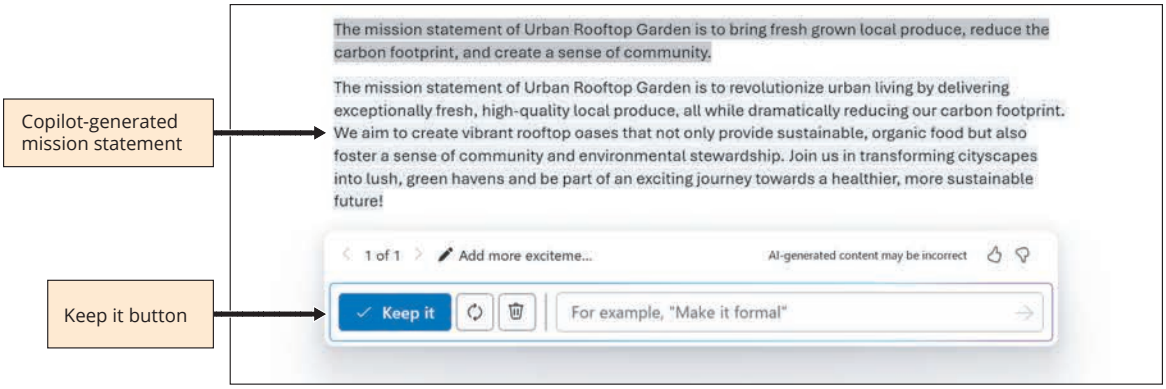
3. Click Make changes. Type the following prompt in the Draft with Copilot box: **Add more excitement to this mission statement and highlight high-quality food with minimal environmental impact** (**Figure 2-22**).

Figure 2-22: Make changes option using Copilot



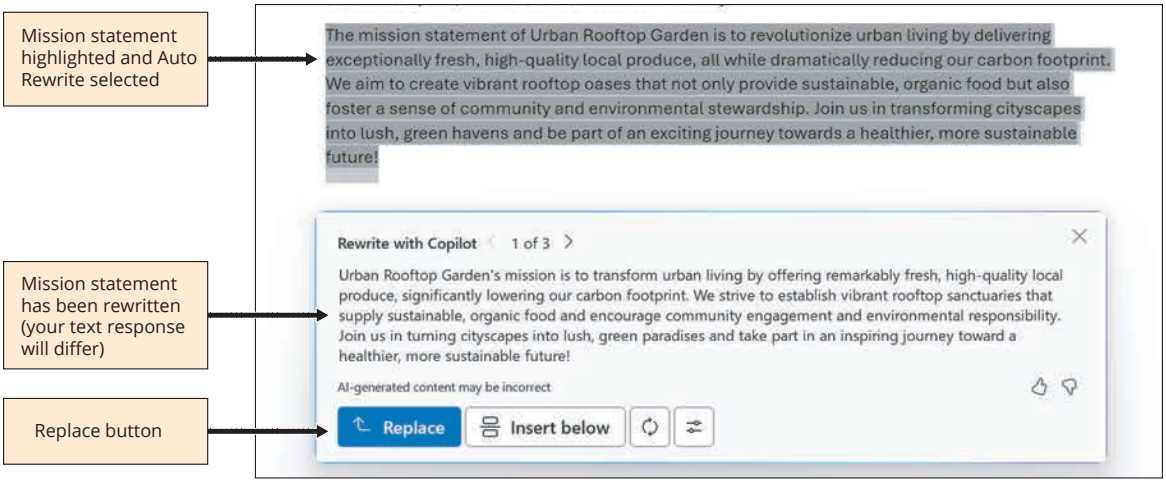
4. Click the Generate button to generate the AI content. The AI-generated text appears below the original mission statement text (**Figure 2-23**). Your text response will be different. You can now determine if you want to keep the AI-generated text or modify it with another prompt.

Figure 2-23: AI-generated mission statement using Make changes option



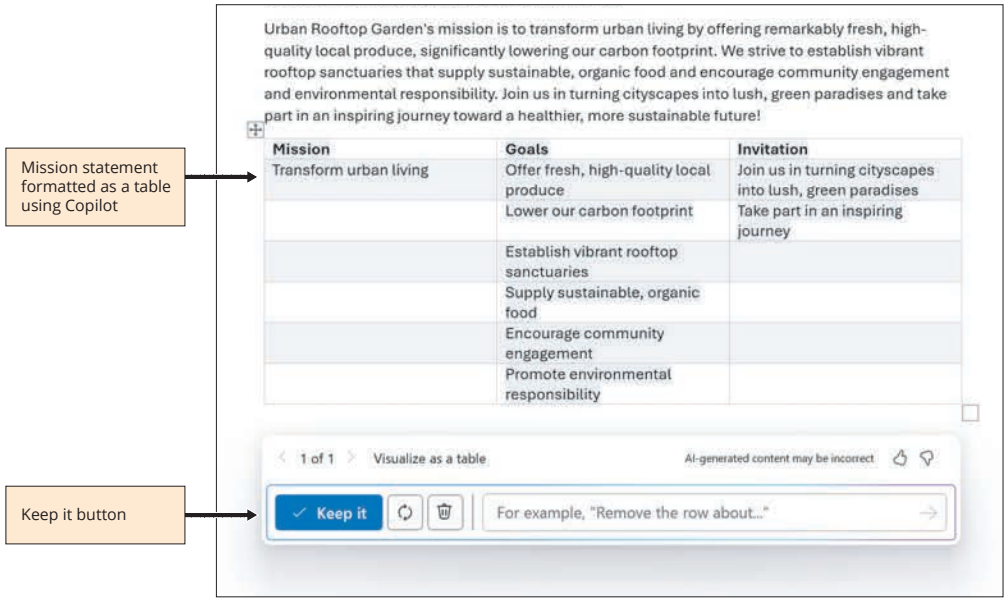
5. Click Keep it to preserve the new mission statement.
6. Select the new AI-generated mission statement and click the Copilot icon.
7. Click Auto Rewrite to generate a reconstructed mission statement (**Figure 2-24**). Your text response will be different.

Figure 2-24: Auto Rewrite remade the mission statement



8. Click the Replace button. Select the newly generated AI content mission statement.
9. Click the Copilot icon again and then click Visualize as a Table to display the content on the mission statement structured as a table (**Figure 2-25**). Options include Keep it, Discard, Regenerate, and giving more instructions to Copilot, such as if you want it to add another column.
10. Click the Keep it button.

Figure 2-25: Mission statement AI-generated text displayed as a table



Chatting with Copilot about Your Word Document

Beyond generating content, Copilot in Word supports questions about the entire Word document. After providing answers to your questions, Copilot provides the referenced sources along with citations used by the AI tool within your document. For example, if you were sent a document about a new product that your boss wants to review, you can use the Copilot pane to assist in reviewing the document in the following ways:

- **Summarize documents with ease:** Type "Summarize this document" directly into the Copilot chat pane to generate a summary that helps you quickly grasp the key topics.
- **Provide concise bullets:** Copilot can analyze the document and provide a bulleted list highlighting the essential points.
- **Create custom types of documents:** You can tailor the prompt further by specifying the types of documents Copilot can summarize such as an email message, article, blog, or report.

Prompt Along 2-4

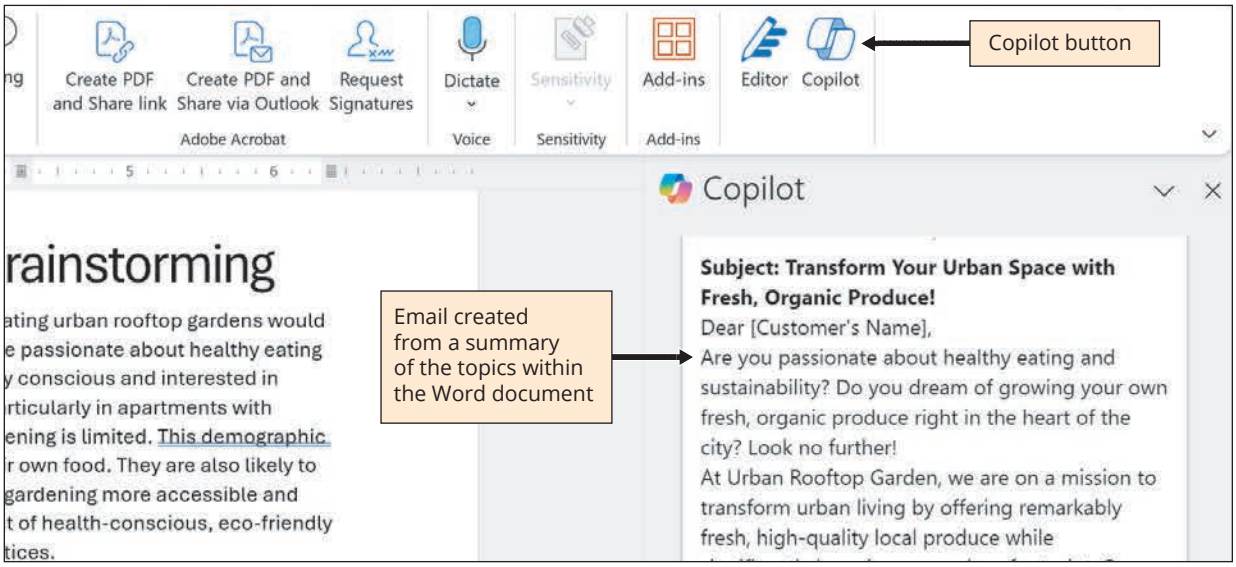
To summarize your sample document using Copilot:

1. On the Home tab of the same Word document, click the Copilot button (or press Alt+I) to display the Copilot pane.
2. In the Copilot pane, type the following text in the Ask me anything about this document box: **Summarize the document to design an email that ignites customer interest and encourages them to engage with our brand.**

3. Click the Send button. Copilot generates an email based on everything summarized from the existing document (**Figure 2-26**). Your email will have different text within the response.

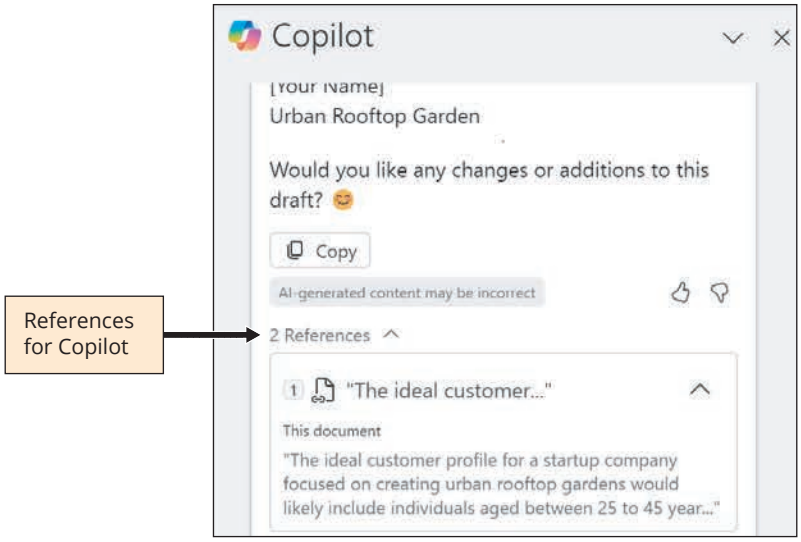
4. Save the Word document using **Urban Rooftop Gardens Brainstorming** as the filename.

Figure 2-26: Email created by summarizing Word document



References are provided near the bottom of the Copilot pane below your response (**Figure 2-27**). The References arrow is expanded to display the references to the sources Copilot AI used in the document. Based on your prompt, Copilot taps into the vast resources of the web and its language library. It searches for relevant information, data, and content that align with your needs. This allows Copilot to suggest content and even find supporting visuals to enrich your document.

Figure 2-27: Copilot references



2.5 | Two Rights & a Wrong

Read the following three statements and then identify the incorrect one.

1. Microsoft Copilot can be used in Word Online, Windows, and Mac but not Apple iPad apps.
2. In Microsoft Word, Copilot can check grammar and suggest improvements to make documents sound more polished and professional.
3. Because Copilot considers the context of each prompt, it may respond with a different response even if the same prompt is entered.

Answers at end of chapter

2.6 Developing Microsoft PowerPoint Slides Using Copilot

After completing a brainstorming document in Word such as for the Urban Rooftop Gardens business, you may need a presentation to summarize the information into a slide deck to share in customer meetings. Copilot within PowerPoint further assists you by turning ideas into a designed presentation based on AI prompts. The prompts can request a 10-slide presentation from scratch, generating relevant slides with royalty-free images and layouts on a particular topic, transitions between slides and animations to keep your presentation dynamic and engaging, and even a new slide with an inspirational quote for interest. Remember you are ultimately the designer and Copilot's suggestions are based on your input and your overall presentation goals. You can leverage its recommendations or choose from PowerPoint's slide layouts and presentation themes to tailor your presentation to your specific needs. Once you type a prompt, Copilot suggests wording and a flow for your presentation, making sure your ideas are clear to your audience.

Creating a New Presentation with Copilot in PowerPoint

Instead of starting with a blank white screen, Copilot within PowerPoint takes your concept from the AI prompt you enter and then searches the web, gathering relevant information to construct a presentation tailored to your needs. You can start from scratch or upload an existing file such as a Word document to use as the basis of the presentation. You can even start with an already created PowerPoint presentation and then add more individual slides and images. When you create a new slide deck from scratch, Copilot generates pre-populated slides with well-designed layouts based on your topic, inserts Creative Commons open-source images (meaning you do not have to research copyright information), and even leaves room for charts and illustrations. Be sure to consider the slides Copilot produces as an initial first draft that serves as a springboard, saving you time and effort. Think of Copilot's initial slide deck as a well-organized foundation, ready for your personal touch. Remember, the presentation should reflect your unique voice, your personality, your company's voice, and your expertise. Feel free to elaborate on Copilot's suggestions. Be sure to adjust the order of the slides or even remove slides that do not meet your needs.

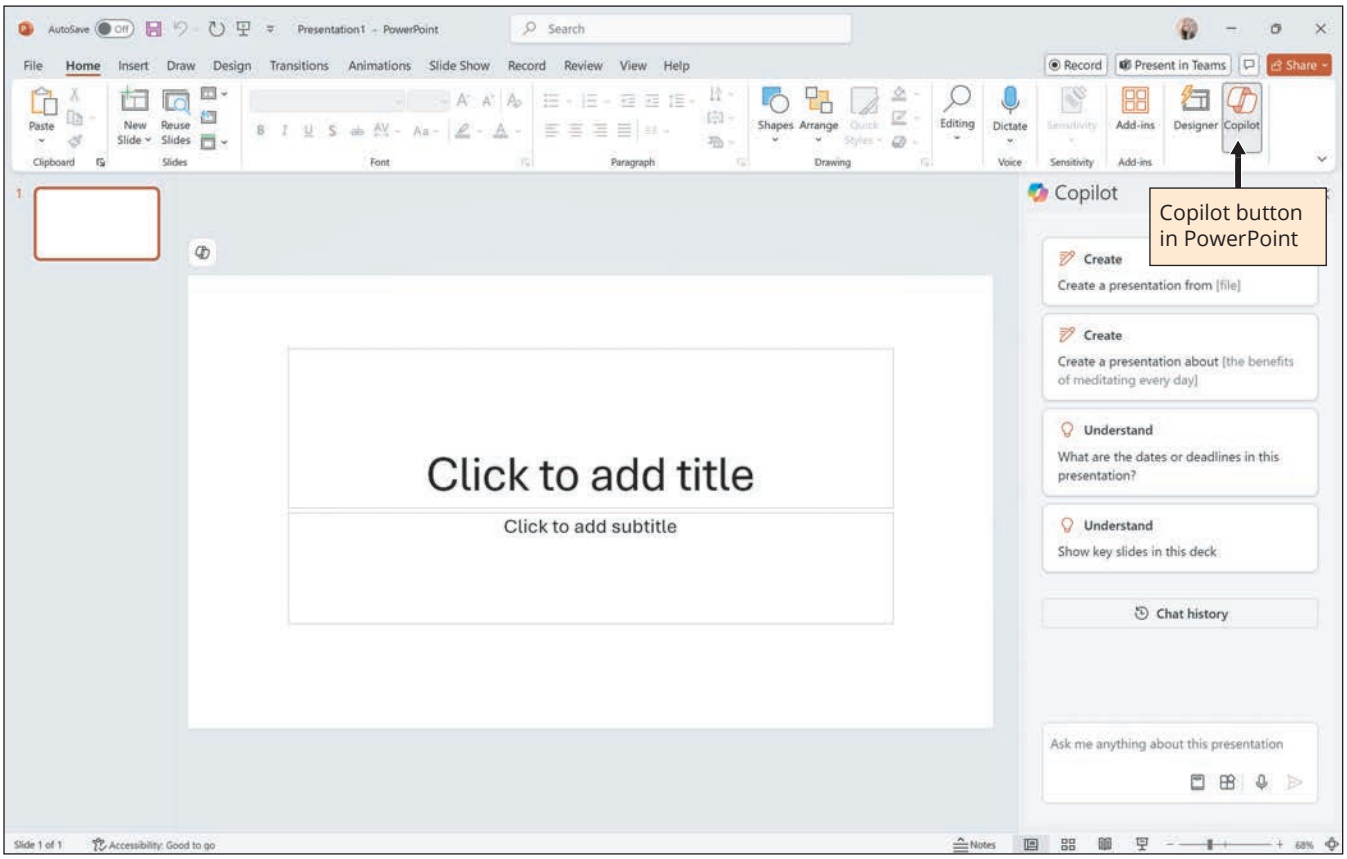
Prompt Along 2-5

If you have access to Copilot through a Microsoft 365 subscription, complete the following steps. Otherwise, read the following section and examine the figures, but do not perform the steps.

To create a new PowerPoint presentation using Copilot based on the subject of Urban Rooftop Gardens:

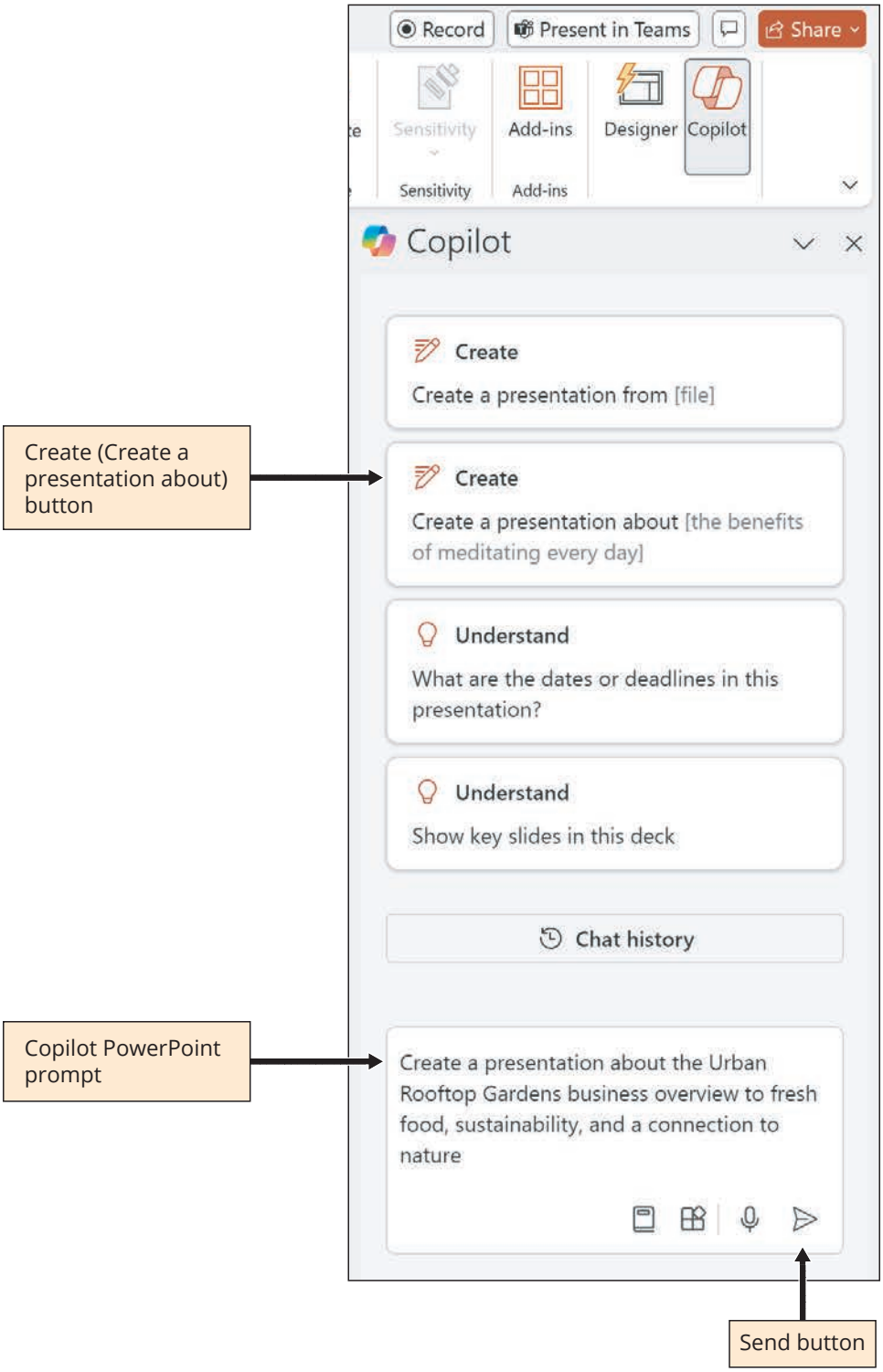
1. Open Microsoft PowerPoint and click Blank Presentation to open a blank slide deck.
2. On the Home tab, click the Copilot button to display the Copilot pane (**Figure 2-28**). You must have a Copilot subscription within Microsoft 365 to have the Copilot button appear on the ribbon.

Figure 2-28: Copilot pane within PowerPoint



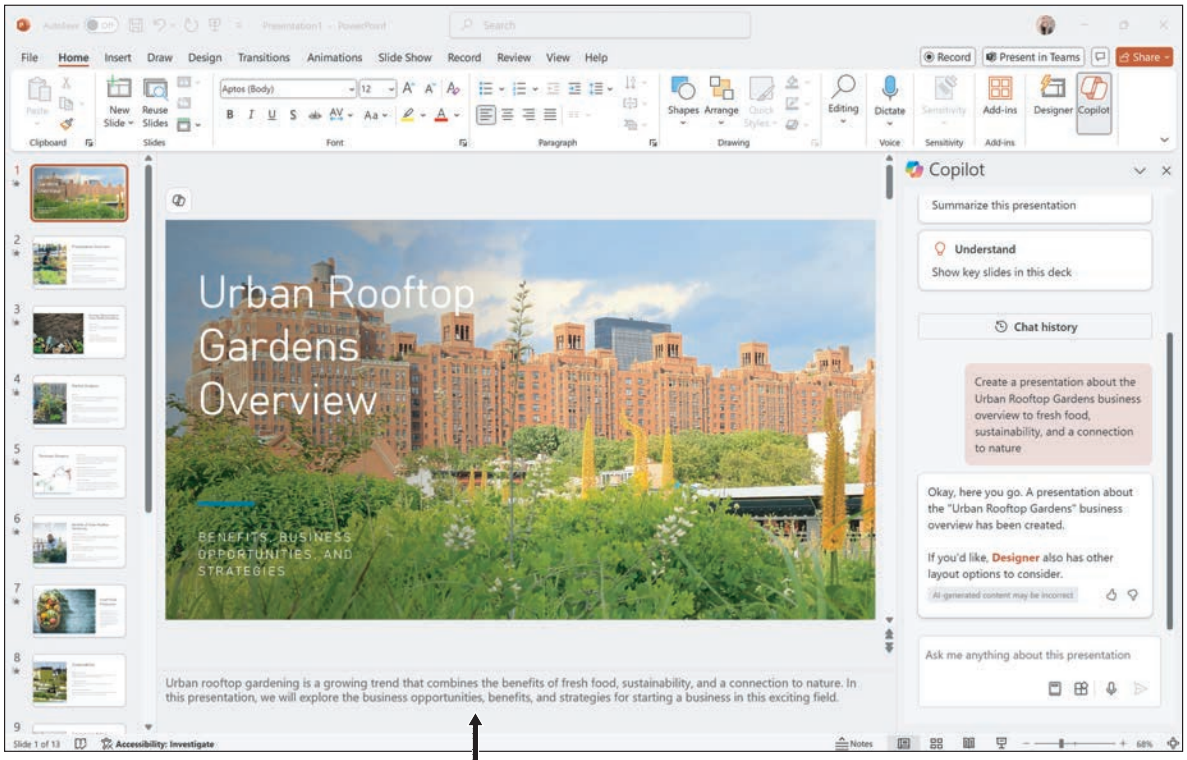
3. In the Copilot pane, click the Create (Create a presentation about) button and in the Prompt box after the text Create a presentation about, type or use the microphone icon to enter the following text: **Create a presentation about the Urban Rooftop Gardens business overview to fresh food, sustainability, and a connection to nature** (**Figure 2-29**).

Figure 2-29: Prompt in Copilot pane for Urban Rooftop Gardens



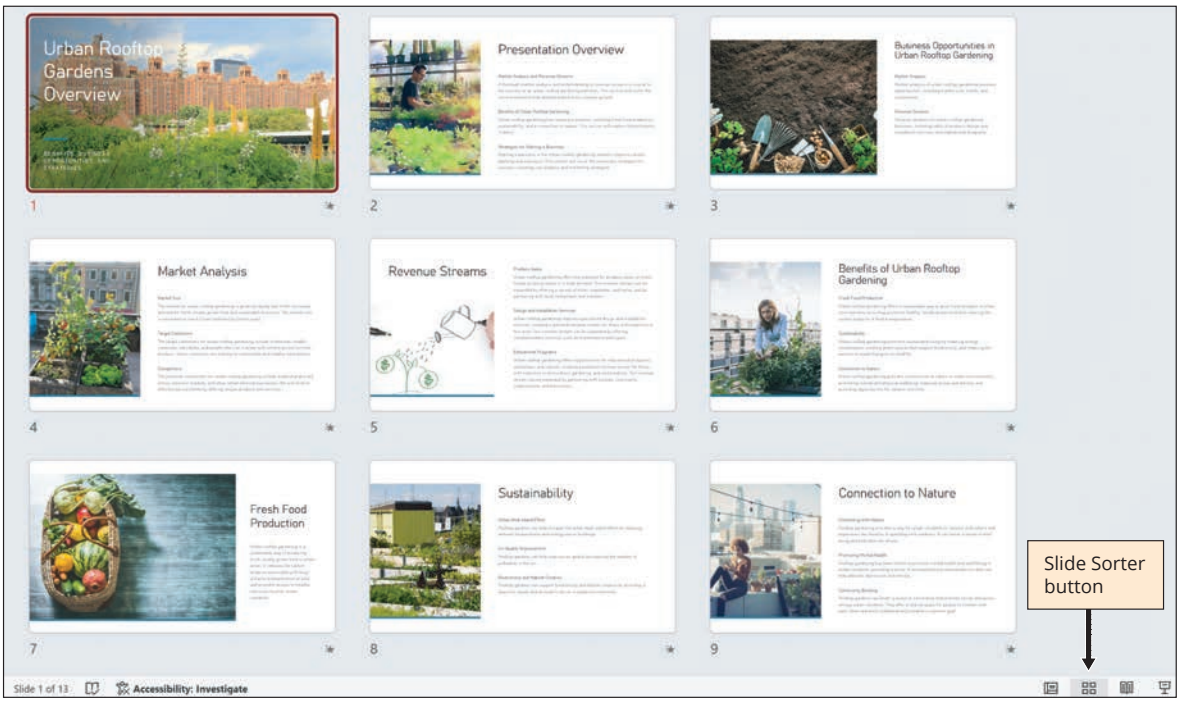
4. Click the Send button to send the AI prompt to Copilot to generate slides based on the prompt with speaker notes below each slide. In **Figure 2-30**, Copilot created 13 slides on the topic. (The number of your slides may vary, and the images and text will be different.)

Figure 2-30: Copilot-generated slides with speaker notes



5. Click the Slide Sorter button in the bottom right to display all the slides (**Figure 2-31**).

Figure 2-31: Copilot-generated slides displayed in Slide Sorter view



Adding a Slide into an Existing Presentation with Copilot in PowerPoint

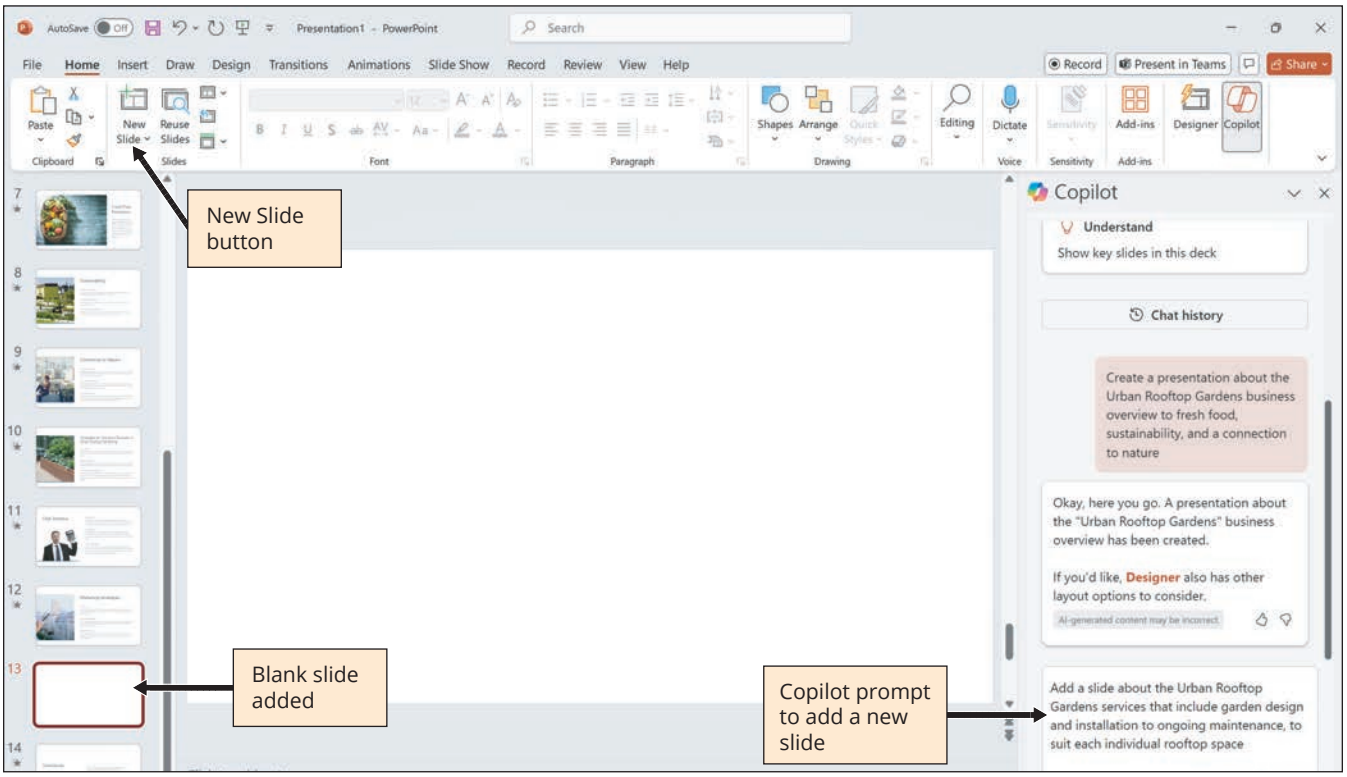
After reviewing the generated slide deck, you might find that the presentation is missing a slide, such as one highlighting the services that Urban Rooftop Gardens can provide. The company offers a range of services to suit each individual rooftop space, from design and installation to ongoing maintenance. With Copilot's help, you can insert a slide about the company's design services while ensuring a flourishing garden and even include animation to add interest to the presentation. Copilot can also suggest stock images for a presentation. You can ask Copilot to "Add an image of a rooftop garden with an interesting design" and it will review the available stock images and select one to add to the presentation. You can use other documents to craft your slides by typing "Create presentation from file" as a prompt in PowerPoint.

Prompt Along 2-6

To use Copilot to add a slide to the current presentation with an image:

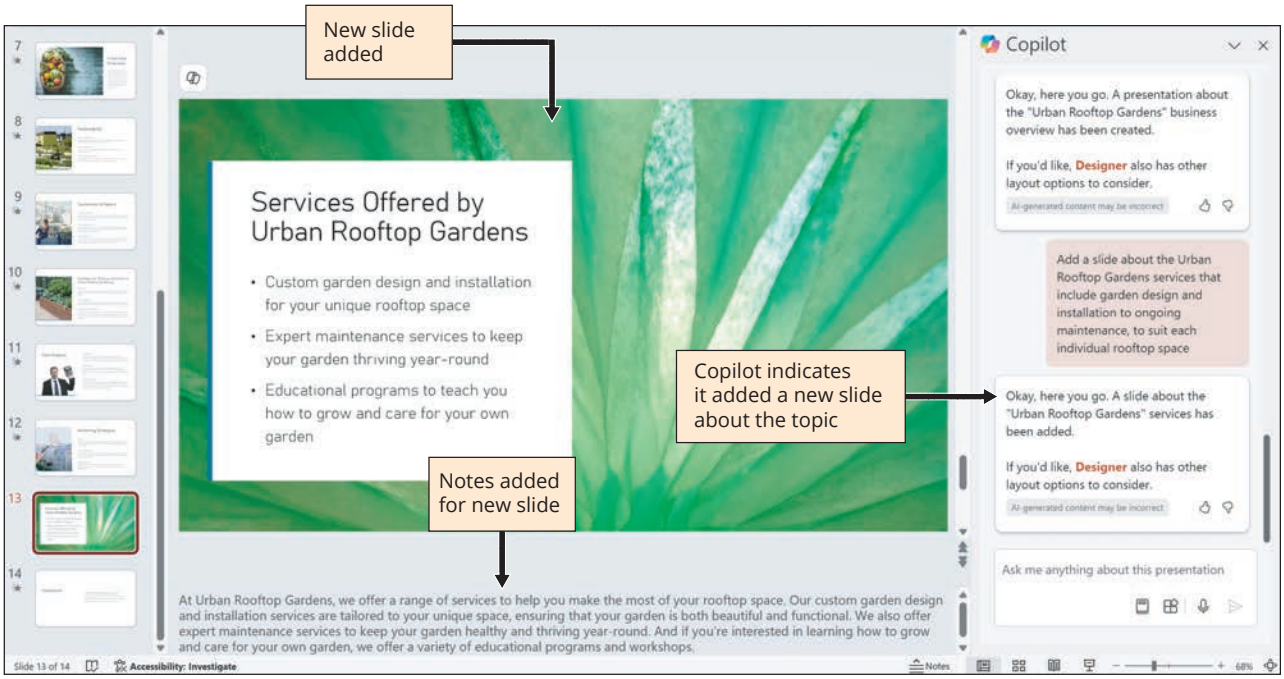
1. Double-click the last slide of the draft presentation in the Slide Sorter view to display the same slide in Normal view.
2. In the Thumbnail pane on the left, click between the next to last slide and the final slide.
3. If needed, on the Home tab, click the Copilot button to display the Copilot pane.
4. In the Copilot prompt box, type **Add a slide about the Urban Rooftop Gardens services that includes garden design and installation to ongoing maintenance, to suit each individual rooftop space** (**Figure 2-32**).

Figure 2-32: A new slide request in the Copilot pane



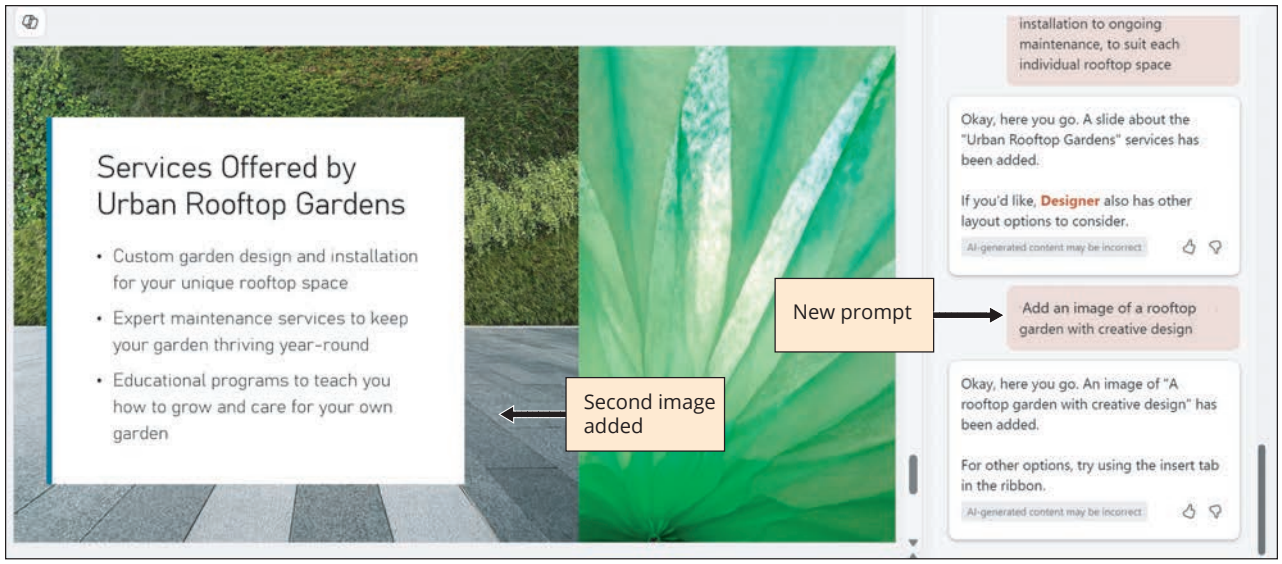
5. Click the Send button. Copilot generates a new slide (**Figure 2-33**). Your slide will vary.

Figure 2-33: Copilot adds a new slide with notes



6. In the Copilot prompt box, type **Add an image of a rooftop garden with creative design** and click the Send button. A new image is added to the new slide (**Figure 2-34**). Your image will be different.

Figure 2-34: Copilot adds an image to the slide



7. In the Copilot prompt box, type **Animate this slide** and click the Send button to add animation to the current slide for more interest.
8. Click the Slide Show tab and then click From Beginning to view the entire slide show.
9. Save the presentation using **Urban Rooftop Gardens Presentation** as the file name.

Company Security of Copilot and ChatGPT

Safety is a major concern when selecting an AI assistant like Copilot or ChatGPT for any company. Both have impressive features, but knowing their differences can be vital for your business. **Commercial data protection** is common in most businesses when it comes to securing your company's information. Commercial data protection is the practice of safeguarding sensitive business information such as trade secrets, customer names, credit card numbers, and other private information from unauthorized access or disclosure. Company versions of software are often called enterprise versions, which means that they have extra layers of protection to keep information safe from prying individuals. Here's a breakdown of why Copilot might be a safer and more secure option for your company:

- **Data privacy and control:** Copilot keeps your company's data private. It does not store your data outside of your designated workspace. This ensures your confidential information stays within your control. ChatGPT, the publicly available version, has limitations on data privacy. Although OpenAI, the creators of ChatGPT, attempts to provide strong security, company data could be used for training purposes or accessed by unauthorized parties.
- **Company security measures:** When a company purchases Microsoft 365, it sets up security procedures called protocols based on the company's needs. Because Copilot is part of Microsoft 365, it follows those same security measures. ChatGPT, on the other hand, is designed for a general audience and does not know your exact security needs. A version of ChatGPT called Enterprise has a much higher level of security.
- **Support and service:** When you invest in a powerful tool like AI, you need to know that help is available when you need it. The Enterprise version of ChatGPT comes with dedicated support. Your company will have access to experts who can help you get the most out of the tool and troubleshoot any issues. It is like having a team of mechanics on call to keep your car running smoothly.

2.6 | Two Rights & a Wrong

Read the following three statements and then identify the incorrect one.

1. Copilot within PowerPoint further assists a user by turning ideas into a designed presentation using AI prompts.
2. PowerPoint Copilot does not allow the user to upload an existing document or edit an existing PowerPoint presentation but can only be used when starting from scratch.
3. Even when using Copilot within PowerPoint, the final presentation should reflect the user's unique voice, personality, and expertise.

Answers at end of chapter

2.7 Perceiving AI's Impact on Business and the Economy

The seeds of AI were planted in the mid-20th century by creative people like Alan Turing, who started building the foundation of early AI with the Turing test. In the decades that followed, early limitations in computing power hindered progress. But today, the explosion

of data in this new digital age, along with advancements in machine learning and deep learning, has propelled AI into the forefront of technological innovation. The Turing test sparked early AI research, but it did not prove the level of true intelligence.

In 2007, a new term was coined called AGI, which stands for **artificial general intelligence** (**Figure 2-35**). AGI refers to a type of artificial intelligence that can understand, learn, and apply knowledge in a way that is indistinguishable from human intelligence. AGI is different from the Turing test as it measures whether AI can solve multiple problems in new situations instead of just focusing on one task. Despite AGI being a future goal, current AI advancements are influencing numerous industries. Following are some ways these technologies, though not yet AGI, are transforming different business sectors.

Figure 2-35: AGI is knowledge that is the same as human reason

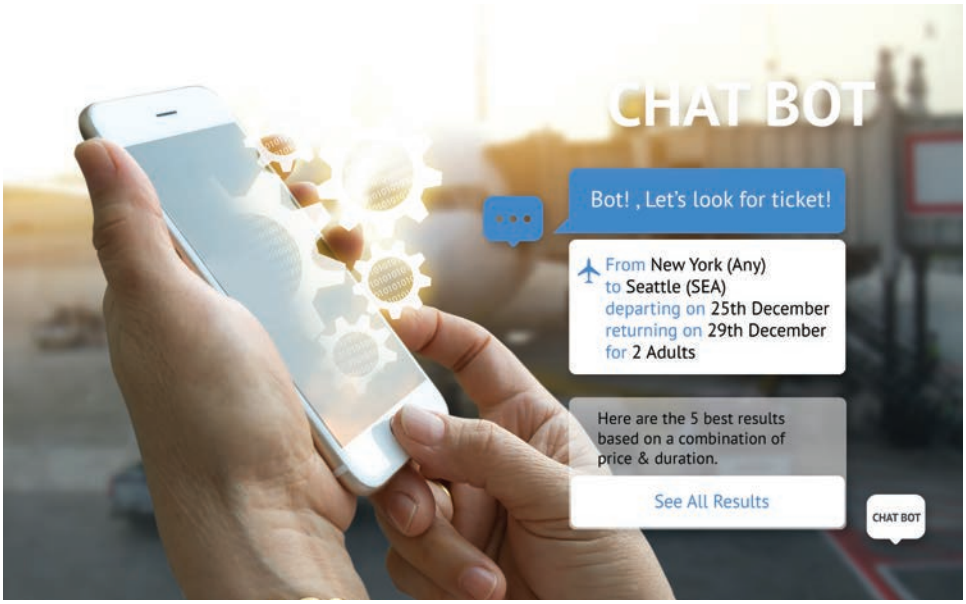
LuckyStep/Shutterstock.com

Customer Experience Reimagined

AI is reshaping the business economy and altering the workforce. Entire industries are starting to shift from a human-based workforce to AI-based services, especially in the customer service field. For decades, when a flight was cancelled due to weather or maintenance issues, customers would spend hours waiting on the phone or standing in a line at the airport to speak to a customer agent. AGI is rapidly transforming the landscape of customer service in the airline industry, specifically in the realm of rebooking. AI chatbots, which simulate having a conversation with a virtual assistant on a website or messaging app (**Figure 2-36**), can now assist tens of thousands of customers at the same time to rebook their flights, 24 hours a day, seven days a week, at a great cost savings. These greatly improved chatbots use NLP to recognize the intent behind a user's message and generate appropriate responses.

Chatbots, however, are still far from perfect. While they are improving each year, they can still struggle with complex or hard-to-understand questions. Chatbots cannot replicate human emotions or empathy, which can be important in certain customer service situations. As the number of chatbots increases, industries like banking, e-commerce, and travel with high volumes of repetitive customer inquiries are likely to see a greater automation of tasks, impacting jobs currently performed by humans. AI is rapidly transforming the job market, and while it is creating new opportunities, it also poses a risk of automation for certain roles throughout fields such as customer service, manufacturing, accounting, news reporting, and loan processing.

Figure 2-36: AI chatbot rebooking a flight



Zapp2Photo/Shutterstock.com

Data-Driven Decision Making

In the AI age of information, businesses are focusing on data. Data helps business leaders interpret underlying trends to understand what products their customers are interested in now and into the future. How does AI data shape your interaction when you see an ad for a product you are interested in?

Scenario with AI Data

Maya, a 19-year-old college student with a passion for fitness, is scrolling through her Instagram feed when an interesting ad pops up. It features a pair of modern wireless earbuds with active noise cancellation, perfect for blocking out gym noise during her workouts (**Figure 2-37**).

Figure 2-37: AI-based earbud ad tailored to user preferences

Jacob Lund/Shutterstock.com

Behind the scenes, AI and data are at play. Maya has recently interacted with fitness-related content on Instagram, and her search history reveals an interest in workout equipment. Advertisers use this data to target her with relevant ads, making the wireless earbuds appear on her feed at the precise moment she might be receptive.

Intrigued, Maya clicks the ad, which takes her to the earbud company's website. As the website loads, AI algorithms in the background analyze Maya's browsing behavior. They track the features she spends the most time on, like battery life and noise cancellation details.

Maya decides to add the earbuds to her favorites list for later consideration. This action further strengthens her browsing profile. The website might also offer a pop-up discount. The next day, Maya wakes up to an email from the company. AI, analyzing her website activity, triggered an automated email campaign. The email offers a special welcome discount and highlights the benefits of creating an account for faster checkout. The email also shows positive customer reviews and social media mentions to build trust and encourage Maya to purchase. This scenario illustrates how AI data plays a constant role in the shopping journey, from targeted advertising to email marketing campaigns and social media influence.

Opportunities and Concerns with the New AI-Based Economy

The vast amount of private data collected about everyone has significant positive and negative implications. Collected AI data can make you safer. AI can analyze your spending habits and recognize unusual patterns, like a purchase from a different country you have never visited or for a product you never have purchased. This helps banks stop fraudulent transactions before an online thief can drain your financial accounts.

Figure 2-38: AI-based home detection cameras

Eric Broder Van Dyke/Shutterstock.com

New home AI-powered security cameras (**Figure 2-38**) are smarter than a basic video camera. Unlike traditional cameras that trigger alerts for any movement, AI can distinguish between familiar faces like yours or those of your friends and unfamiliar ones, reducing false alarms and unnecessary notifications. AI-powered cameras can differentiate between a familiar pet and an intruder. Similarly, AI can analyze your daily routine and detect unusual activity in your house, potentially sounding an alarm and alerting authorities to a break-in.

As businesses gather more personal data, however, the risk of **data breaches** grows. If private customer information is mistakenly entered into public AI models like Copilot or ChatGPT, it could be exposed to others when AI answers a question. Data breaches happen when unauthorized people gain access to private information such as your address, identification numbers, credit card details, and medical records. These breaches can have devastating consequences for individuals and businesses, leading to financial losses, identity theft, and damaged reputations. A large data breach can ruin consumer trust in businesses.

One of the three major credit reporting agencies in the United States, Equifax, experienced a devastating data breach in 2017. The breach exposed the personal

information of an estimated 148 million Americans, including Social Security numbers, birth dates, and addresses. The breach severely damaged Equifax's reputation and led to a loss of consumer trust. This is just one example of the thousands of data breaches that happen every year. These criminal breaches can result in funds being stolen from your personal accounts, unauthorized account access, and difficulty securing loans or credit cards in the future.

The journey of AI from its inception to the present day has had many significant milestones. From the early days of the Turing test to the rise of machine learning and deep learning, AI has evolved to become a huge part of various industries and applications. The development of deep learning models and their application in fields such as speech recognition, machine translation, and medical diagnosis has revolutionized the way you interact with technology and process information. Looking to the future, the continued integration of AI technologies like Microsoft 365 Copilot into productivity tools promises to further enhance your capabilities and drive innovation. Jobs may require many people to learn new technology skill sets over their careers. The certainty of AI is changing almost every job pathway and clearly will change your future.

2.7 | Two Rights & a Wrong

Read the following three statements and then identify the incorrect one.

1. AGI is a type of AI that can understand, learn, and apply knowledge in a way that is indistinguishable from human intelligence.
2. The use of AI has decreased the risk of a data breach because AI can always detect the actions of a data thief.
3. Unlike traditional cameras that trigger alerts for any movement, AI-powered cameras can distinguish between familiar faces and unfamiliar ones, reducing false alarms and unnecessary notifications.

Answers at end of chapter

Summary

- Alan Turing proposed the Turing test in the 1950s. The Turing test suggests that a machine can be considered intelligent if it can hold a conversation indistinguishable from one with a human. The Turing test provided a benchmark for evaluating progress in AI and fueled research into natural language processing and human–computer interaction. Each decade since the 1950s has introduced new ideas and approaches to move AI forward.
- Machine learning (ML), introduced in the 1960s, is a way for computers to learn to recognize patterns from many examples and make decisions and then learn from those decisions, without being directly programmed with specific rules for every decision.
- The perceptron, inspired by the structure of the human brain, serves as a basic model for an artificial neuron that receives data and filters it into two categories.
- AI winter is a period of reduced funding, interest, and progress in the field of AI, as in the 1970s and late 1980s. During AI winter, AI researchers paused and reevaluated the direction of their research to overcome technology that was not powerful enough for true AI.
- Computer vision (CV) is a field of artificial intelligence that allows computers to perceive and interpret the world visually as a human does.
- Early natural language processing (NLP) systems relied on keyword spotting, which detects keywords or phrases

used in audio recordings and typed text. If the text contains specific words that match predetermined coded responses, the computer might be able to find a result. This early development of NLP provided the foundation for voice assistants like Siri, Google, and Alexa that understand spoken commands.

- Early AI-enabled robots had simple sensors that could detect tactile sensations and measure distance to objects, allowing them to engage with their surroundings in a limited fashion. Robots with cameras could perform basic image-recognition tasks like identifying parts on an assembly line.
- Deep learning is a type of machine learning that teaches computers to handle data in a way that resembles human brain functions. Typically, deep learning includes three layers: the input, hidden, and output layers.
- Copilot for Microsoft 365 is fueled by deep learning technologies. As you enter prompts, Copilot acts like a virtual assistant to help you brainstorm and research topics, develop drafts, and enhance documents and presentations.
- A recent development in AI is artificial general intelligence (AGI), which refers to a type of AI that can understand, learn, and apply knowledge indistinguishable from how human intelligence works. AGI is different from the Turing test as it measures whether AI can solve multiple problems in new situations instead of focusing on a single task.
- AI is reshaping the business economy, shifting entire industries from a human-based workforce to AI-based services, especially in the customer service field. Businesses use AI-fueled big data to interpret trends, analyze consumer preferences, and make decisions.
- Collected AI data can protect you from fraud, identify theft, and electronic and physical threats, but it also makes you susceptible to data breaches.

Key Terms

AI winter
artificial general intelligence (AGI)
big data
commercial data protection
computer vision (CV)
data breach
deep learning
keyword spotting
machine learning (ML)
perceptron
Turing test

Review Questions

1. In which decade were the early steps taken to start the journey of AI?
2. What is the Turing test and who proposed it?
3. What are the limitations of the Turing test in evaluating AI?
4. What is the core difference between AI software and normal computer software?
5. What was the significance of the Dartmouth College Summer Workshop in 1956?
6. What were some key inventions and progress in AI during the 1960s?
7. What is an AI winter?
8. What advancements in AI occurred in the 1980s?
9. What was the impact of deep learning in the 2010s?
10. What is commercial data protection and why is it important for businesses?
11. How does Copilot ensure data privacy and control for companies?
12. How does Copilot help in brainstorming and creating rough drafts in Microsoft Word?
13. What are the four components of Copilot AI prompts?
14. How can Copilot assist in creating a PowerPoint presentation?
15. How has deep learning impacted medical diagnosis and healthcare?

Hands-On Activities

AI Activity 2-1: Exploring Copilot Text Prompts for Microsoft Word (LO 2.5)

Using **Table 2-3** as an example, create complex Copilot for Word prompts for the following business scenarios and identify the four prompt components of goal, context, expectations, and source (if available) mentioned in **Figure 2-18**. If you have access to Microsoft Copilot, also provide the results of entering each prompt into Word Copilot.

1. Create a Word Copilot prompt with the four components to develop a new product roadmap of a built-in LED modular smart backpack with a laptop sleeve and a portable phone charger. If possible, save the Copilot results as a file named Demographics.
2. Create a Word Copilot prompt with the four components to capture the interest of possible investors in a new restaurant called Global Vegetarian Street Food. The restaurant atmosphere will be vibrant and fast-paced, with a focus on fresh, flavorful food. If possible, save the Copilot results as a file named Menu.
3. Create a Word Copilot prompt with the four components to design an employee handbook at a new startup tech firm and include company policies, procedures, and expectations for employee conduct. If possible, save the Copilot results as a file named Handbook.
4. Create a Word Copilot prompt with the four components to produce a fun nature blog for traveling to off-the-beaten-path destinations and pursuing activities such as exploring ancient ruins, seeking hidden wildlife encounters, or participating in local festivals. If possible, save the Copilot results as a file named Nature.
5. Create a Word Copilot prompt with the four components to develop an outline for a project kick-off meeting. This agenda sets the stage for a new metaverse project for a company developing a virtual reality meeting room, outlining goals, timelines, team roles, communication channels, and showcasing meeting tutorials. If possible, save the Copilot results as a file named Project.

AI Activity 2-2: Exploring Copilot Text Prompts for Microsoft PowerPoint (LO 2.6)

Create the following prompts for PowerPoint with Copilot. If you have access to Copilot in PowerPoint, also submit the PowerPoint file created.

1. Create a prompt in Copilot for PowerPoint that generates 12 slides about AI-driven relaxation techniques to assist with lowering your stress levels and focusing on a healthy lifestyle. Explain that the tone of the slides should be engaging. If possible, save the Copilot results as a file named Relax.
2. Create a prompt in Copilot for PowerPoint that generates 15 slides about AI wearable devices that monitor vital signs, sleep patterns, and activity levels. This data can be used to identify potential health risks, track chronic conditions, and develop a customized health plan. If possible, save the Copilot results as a file named Wearables.

3. Using the slides created in step 2, explain the prompt you would enter between slides 13 and 14 to add a slide discussing a new feature for wearables that can detect sleep apnea.
4. Using the slides created in step 2 and the new slide added in step 3, write the prompt to animate this slide.
5. Create a prompt in Copilot for PowerPoint that uses the Word file created in **Figure 2-17** named Urban Rooftop Gardens Brainstorming to produce a presentation of 10 slides based on the Word document.

Projects

Educators, please create a free account at padlet.com or use another video platform for students to use. Students, create a video discussion board based on the following project descriptions.

1. Research and record a two-minute video at your instructor's padlet.com link or an alternative video discussion board link. Open the website openai.com. Log in with an email address. Record your interaction on video with the chatbot and share your thoughts as you have a discussion with the chatbot. With the Turing test in mind, have a conversation using several questions such as asking ChatGPT to name its favorite movie. When it answers, continue the conversation. Discuss the following topics and ask questions in your own words without reading a script. Share an existing business (not mentioned in this chapter) that is using AI for automation and interests you. Share some examples and discuss the specific tasks being automated. While automation offers efficiency gains, what potential negative consequences might arise from widespread adoption of AI in business operations? How could these be mitigated? (LO 2.2)
2. Research and record a two-minute video at your instructor's padlet.com link or an alternative video discussion board link. Discuss the following topics and ask questions in your own words without reading a script. With the rise of AI, some jobs might be automated. What are your thoughts on this potential job displacement? Share some specific career paths you are considering. What are some concerns you have regarding AI and its potential impact on jobs or society as a whole? How do you think they might be impacted by AI in the future? (LO 2.8)
3. Research and record a two-minute video at your instructor's padlet.com link or an alternative video discussion board link. Discuss the following topics and ask questions in your own words without reading a script. Research a company that has had a major data breach (other than Equifax, which was discussed in this chapter). Explain in your own words what happened in the data breach. Imagine you were a customer of this company and your information was leaked in the breach. How might this affect you? How important is it for companies to protect our personal data? Why? What steps should you take to protect your personal information online? (LO 2.8)
4. Research and record a two-minute video at your instructor's padlet.com link or an alternative video discussion board link. Discuss the following topics and ask questions in your own words without reading a script. Explain why it is essential to treat AI-generated PowerPoint slides as a rough draft rather than a finished product. Discuss the importance of human judgment, creativity, and critical thinking in refining AI-generated content for effective presentations. What topic would you select to create a PowerPoint presentation with Copilot and then update to your own voice? (LO 2.6)

5. Research and record a two-minute video at your instructor's padlet.com link or an alternative video discussion board link. Discuss the following questions and ask questions in your own words without reading a script. How has machine learning and deep learning revolutionized AI? What are some real-world applications of deep learning that have changed your life? (LOs 2.3 and 2.4)

Two Rights & a Wrong: Answers

2.1 Tracing the Evolution of AI

1. One of the key features of AI is its ability to keep learning and improving.
2. The beginning of AI can be traced to the 1990s with the introduction of the Internet.
3. Each decade since the 1950s brought new ideas and approaches to move AI forward.

Answer: The wrong statement is #2.

Explanation: The beginning of AI can be traced to the 1950s with the introduction of digital computers.

2.2 Connecting the Turing Test and Intelligence

1. The Turing test suggested that a machine could be considered intelligent if it could hold a conversation indistinguishable from one with a human.
2. If a person cannot tell the difference between a computer program and a person based on their conversation, then the computer program is considered to have passed the Turing test.
3. Today's AI has shown that it can pass the Turning test.

Answer: The wrong statement is #3.

Explanation: There have been claims of AI passing the Turing test, but these are often debated.

2.3 Applying Machine Learning Innovations

1. Like the Turing test, machine learning (ML) is considered only a theory that cannot be implemented.
2. Perceptron is inspired by the structure of the human brain.
3. The term AI winter refers to a period of reduced funding, interest, and progress in the field.

Answer: The wrong statement is #1.

Explanation: Machine learning (ML) is a way for computers to learn from lots of sample data to recognize patterns and make decisions, without being directly programmed with specific rules for every single decision.

2.4 Illustrating Deep Learning

1. Deep learning is a type of machine learning that teaches computers to handle data in a way that resembles human brain functions.
2. Big data is a crucial requirement for deep learning and includes data such as social media posts and images.

3. It is anticipated that deep learning will play a role in virtual reality in the distant future, but that remains uncertain.

Answer: The wrong statement is #3.

Explanation: Deep learning game development is being used today to create realistic and challenging AI opponents in games.

2.5 Using Deep Learning in Microsoft Office with Copilot

1. Microsoft Copilot can be used in Word Online, Windows, and Mac but not Apple iPad apps.
2. In Microsoft Word, Copilot can check grammar and suggest improvements to make documents sound more polished and professional.
3. Because Copilot considers the context of each prompt, it may respond with a different response even if the same prompt is entered.

Answer: The wrong statement is #1.

Explanation: Copilot can be used in iPad apps.

2.6 Developing Microsoft PowerPoint Slides Using Copilot

1. Copilot within PowerPoint further assists a user by turning ideas into a designed presentation using AI prompts.
2. PowerPoint Copilot does not allow the user to upload an existing document or edit an existing PowerPoint presentation but can only be used when starting from scratch.
3. Even when using Copilot within PowerPoint, the final presentation should reflect the user's unique voice, personality, and expertise.

Answer: The wrong statement is #2.

Explanation: PowerPoint Copilot does allow for document uploads and existing PowerPoint presentation.

2.7 Perceiving AI's Impact on Business and the Economy

1. AGI is a type of AI that can understand, learn, and apply knowledge in a way that is indistinguishable from human intelligence.
2. The use of AI has decreased the risk of a data breach because AI can always detect the actions of a data thief.
3. Unlike traditional cameras that trigger alerts for any movement, AI-powered cameras can distinguish between familiar faces and unfamiliar ones, reducing false alarms and unnecessary notifications.

Answer: The wrong statement is #2.

Explanation: The use of AI has increased risks of a data breach as more user data is stored for AI processing.