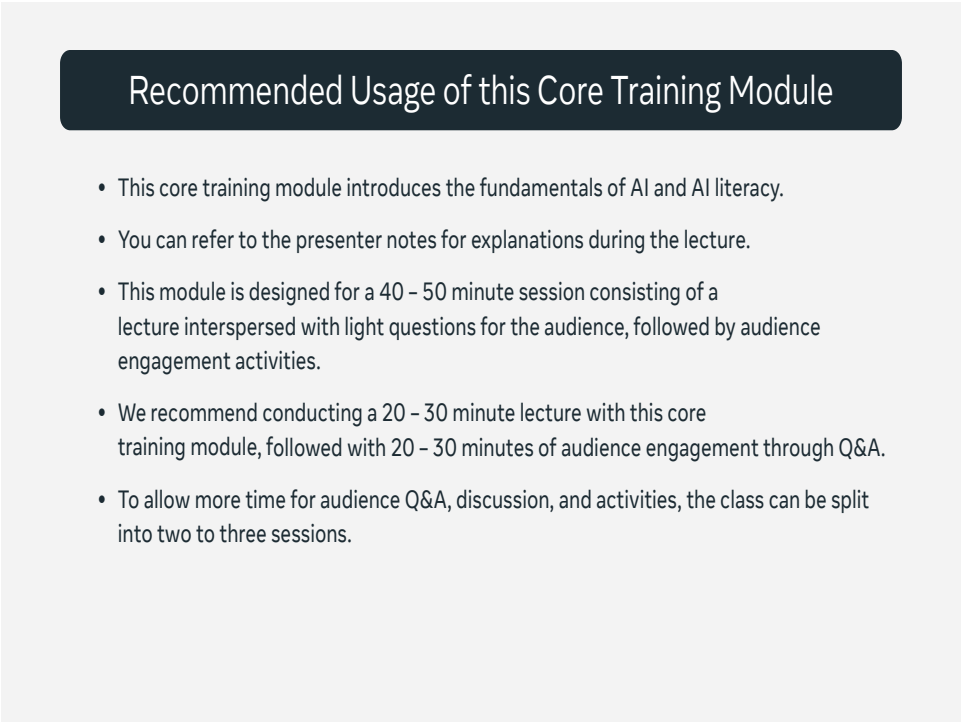
CORE MODULE

CDL, Center for Digital Literacy

AI Literacy

In partnership with:

Meta | WE THINK DIGITAL



These core training modules are designed to be presented to students and used as teaching materials for educators.

Digital literacy is not just about knowledge, but also a practical competency that can be applied in real-life situations. The Center for Digital Literacy recommends a hands-on and practical approach to digital literacy education, with limited focus on lectures.

However, since this first training module aims to provide an overview of AI concepts, it is structured to lean more towards lectures and Q&A sessions rather than being experimental or hands-on.

The suggested format is to allocate approximately 50-60% of the available time (25-30 minutes) for instruction from an educator or trainer, with the remaining time spent on Q&A from participants.

If you prefer to spend more time on questions, discussions, and activities, you can split the class into two or three sessions. Optional activity sheets are also available.

Question 1

Which of these is a real photo of a real person?

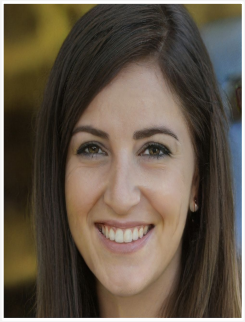
1

2

Question 2

Which of these is a real photo of a real person?

1

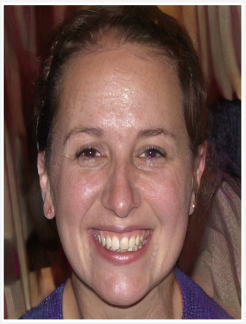


2

Question 3

Which of these is a real photo of a real person?

1



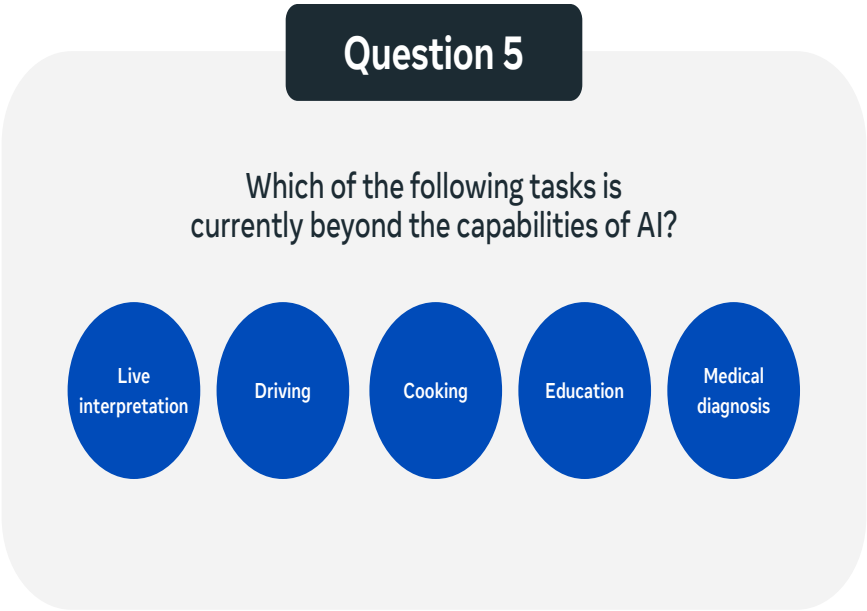
2

Question 4

Which of the following pieces of music was composed and sung by a human?

1

2



This is actually a bit of a trick question: all five examples leverage AI in some way. The real question is how much more can be achieved to enhance the different functionalities.

There are probably very few people who have not used translation apps. AI now provides real-time simultaneous interpretation, and many apps even include this feature during video conferences.

Autonomous driving can be divided into six levels, from Level 0 to Level 5:

- Level 1 is the driver assistance stage, which helps maintain vehicle spacing.
- Level 2 is the stage where partial automation is achieved, such as decelerating or accelerating on its own.
- Level 3 is the autonomous driving stage, where human hands are freed, and the car drives on its own.
- Level 4 enables autonomous driving on most roads, as well as sections with specific conditions such as highways. Driver intervention is not required except in situations like bad weather.

- Level 5 is the stage where complete autonomous driving is possible without a driver, just like in a science fiction movie. At this point, the vehicle will no longer need steering wheels, gears, or brakes.

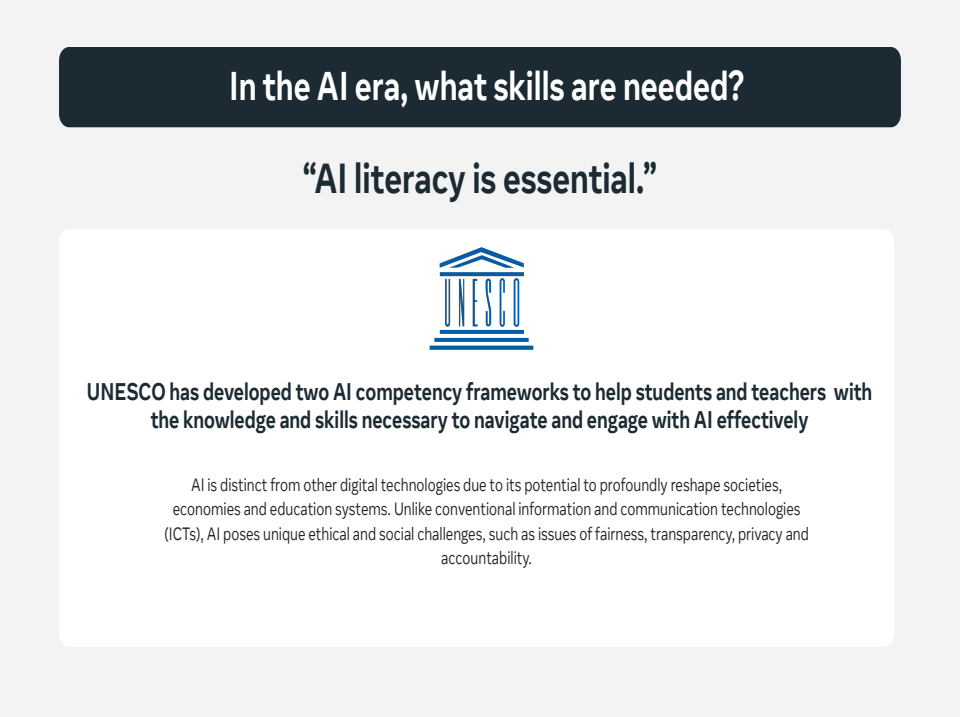
Currently, most vehicles sold by major automobile companies are at Level 2, and they are now trying to sell Level 3 vehicles.

Even cooking is possible with AI. Some people may have seen AI-powered robots that can make customized coffees and drinks or robots that can operate in the kitchen to cook, fry, and perform other duties.

AI has also begun to be used in education, ranging from software with artificial intelligence functions such as translators and creative tools to AI assistant teachers that help students learn. In Korea, starting in 2025, AI textbooks that will support customized learning for each student will be introduced into schools. This will help identify individual students' strengths and areas for improvement, providing individualized support based on each student's learning preferences.

Artificial intelligence is also being used in the medical field, from research to patient care and healthcare administration. Just as the industrial revolution began with the development of the steam engine and the information revolution began with the development of computers, AI has the potential to bring about transformative change across industries and society.

Understanding the basic concepts of what AI is, how it works, and the opportunities and challenges it presents will be critical to navigating this new technology safely and responsibly.

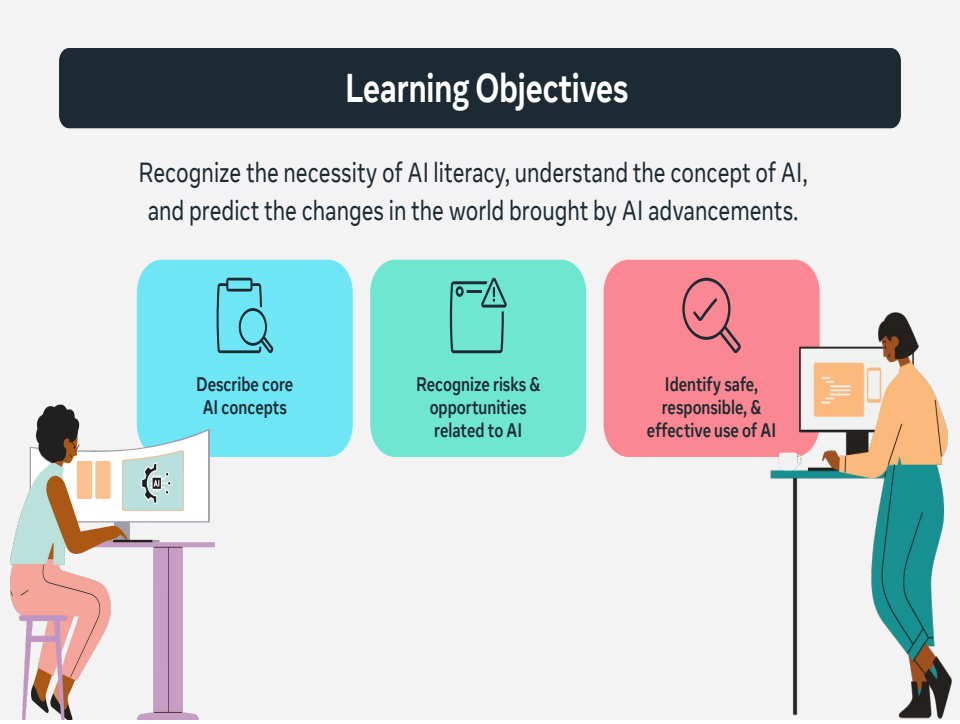


Artificial Intelligence (AI) is poised to transform the economy and various aspects of our lives as it becomes increasingly ubiquitous.

Therefore, it is essential for individuals of all ages and technical backgrounds to understand what AI technology is, its current state, and its future developments. Having a fundamental level of AI literacy will be critical in preparing people to safely navigate AI tools and AI-enabled technologies.

UNESCO defines AI literacy as "the knowledge, skills, and attitudes that teachers and students need to understand, use, and apply AI in an ethical and responsible manner." Both organizations emphasize the significance of AI literacy as a crucial skill for future generations.

AI literacy encompasses not only knowledge but also the practical ability to understand, use, and apply AI in real-life situations. It includes both technical skills and ethical and healthy attitudes and practices

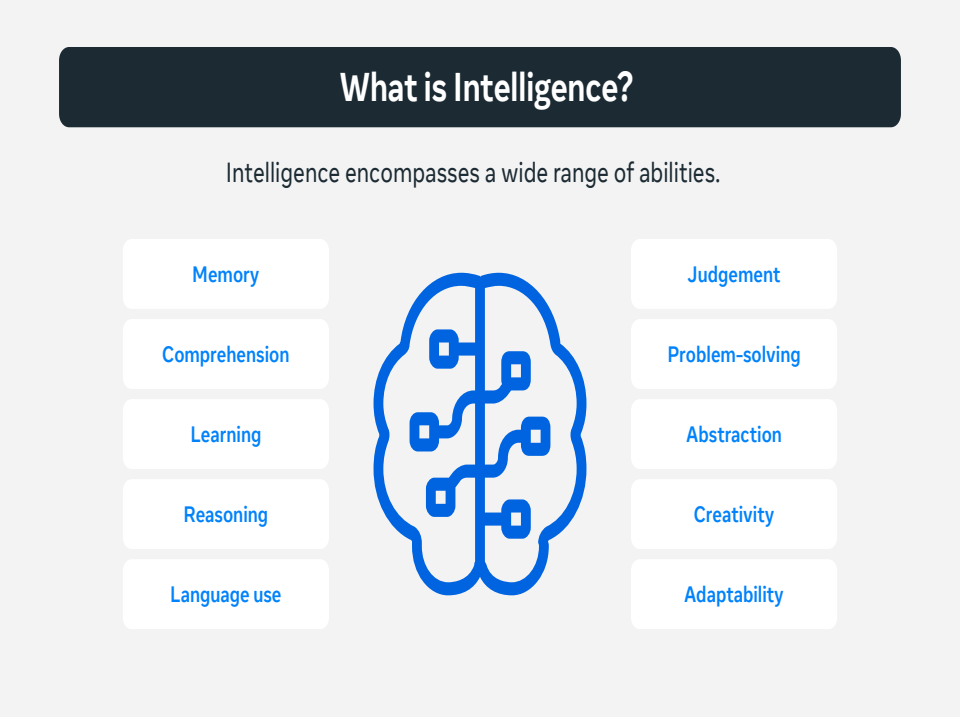


As a first step in improving AI literacy, an essential competency for future talent, the goals of this educational material are as follows:

The primary objective of this training is to equip you with a fundamental understanding of AI, enabling you to recognize its potential impact on the world and make informed decisions.

To achieve this, we will cover the core concepts of artificial intelligence, including its benefits and risks. We will also explore the opportunities and challenges presented by AI development, and provide guidance on how to use AI safely, responsibly, and effectively.

By the end of this training, you will have gained a solid foundation in AI literacy, empowering you to navigate the rapidly evolving AI landscape with confidence.



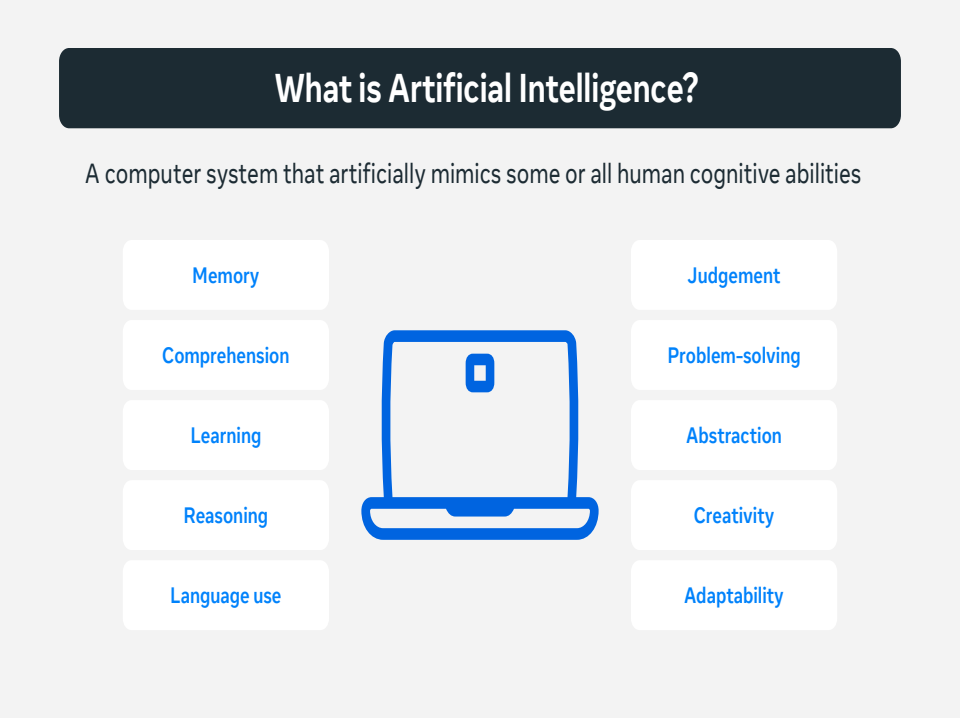
Before exploring artificial intelligence, let's consider what we mean by "intelligence."

Intelligence encompasses a broad range of abilities, including:

- Perceiving and processing information through senses like sight and hearing
- Learning and remembering new things
- Reasoning and drawing conclusions based on available information
- Using language to communicate effectively
- Making judgments and choosing the best solution from available options
- Solving problems and finding creative solutions
- Abstracting complex information to identify key features
- Generating new ideas and combining existing ones creatively
- Adapting flexibly to changing environments and situations

Humans possess this multifaceted intelligence, which enables us

to navigate and interact with the world around us.



Artificial intelligence (AI) is a computer system designed to mimic human intelligence.

As AI is modeled after human intelligence, it possesses many of the same capabilities, including learning, storing vast amounts of information, recognizing patterns, understanding complex language and concepts, logical reasoning, and problem-solving skills.

However, AI still lacks human-level common sense, creative thinking, and ethical judgment abilities. While it can generate new ideas and create works of art, its creativity and imagination are limited compared to humans.

AI demonstrates strong performance in specific domains but struggles with adapting to completely new environments or situations. Additionally, AI lacks human-level ethical judgment and value judgment abilities

Despite these limitations, AI continues to develop rapidly, overcoming its constraints through advancements in technology. Unlike humans, AI can operate 24/7 without breaks, and its performance can be improved by increasing computing power.

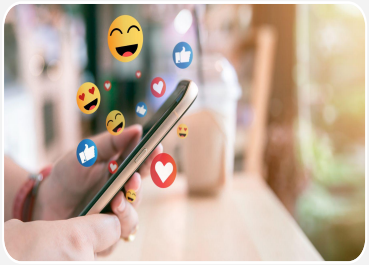
In the future this may lead to Artificial General Intelligence, with functions like reasoning, planning and perception that bring us to human capabilities and beyond.

Advancements in Computing Power

Processors have improved to the point where your smartphone could guide 610,000 Apollo 11 moon missions simultaneously

Apollo guidance computer

- Processing Speed: 2.048 MHz (2 million calculations per sec)
- Memory (RAM): 64KB
- Storage: 72KB
- Size: Similar to a large backpack
- Weight: Approximately 32kg



Smartphone CPU

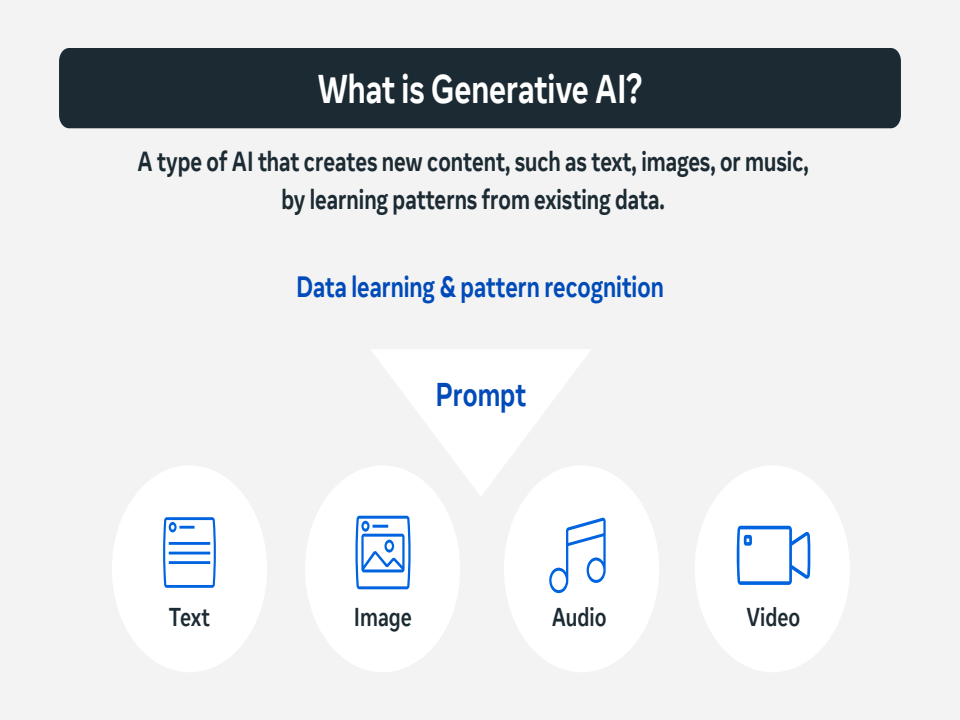
- 3.2 GHz (1,600 times faster than the Apollo guidance computer)
- Memory (RAM): 4GB (62,500 times larger)
- Storage: 128GB (1.7 million times larger)
- Size: Palm-sized
- Weight: Approximately 174g (183 times lighter)

The rapid development of artificial intelligence (AI) technology is largely attributed to the significant improvements in computing power.

Core technologies such as social networks, cloud computing, and natural language processing have enabled the rapid advancement of AI since the 2000s. These technologies are all data-related, and the development of cloud computing has made it possible to store, share, and accumulate large amounts of data.

The core of AI technology is data processing, which would not have been possible without significant improvements in computing power. The Apollo guidance computer used in Apollo 11 had a data processing speed that was 1,600 times slower than the latest smartphone, and its memory was 62,500 times smaller.

This significant improvement in computing power has enabled the rapid processing of large amounts of data, thereby advancing AI technology. As computing power continues to improve, we can expect AI technology to continue to advance and become increasingly integrated into our daily lives.



Generative AI refers to artificial intelligence technology capable of creating various forms of data, such as text, images, audio, and video. This technology can generate new data based on given input data.

Generative AI can produce new content and ideas, including conversations, stories, images, videos, and music.
It can translate languages, write articles, and create images, music, and videos based on user requests
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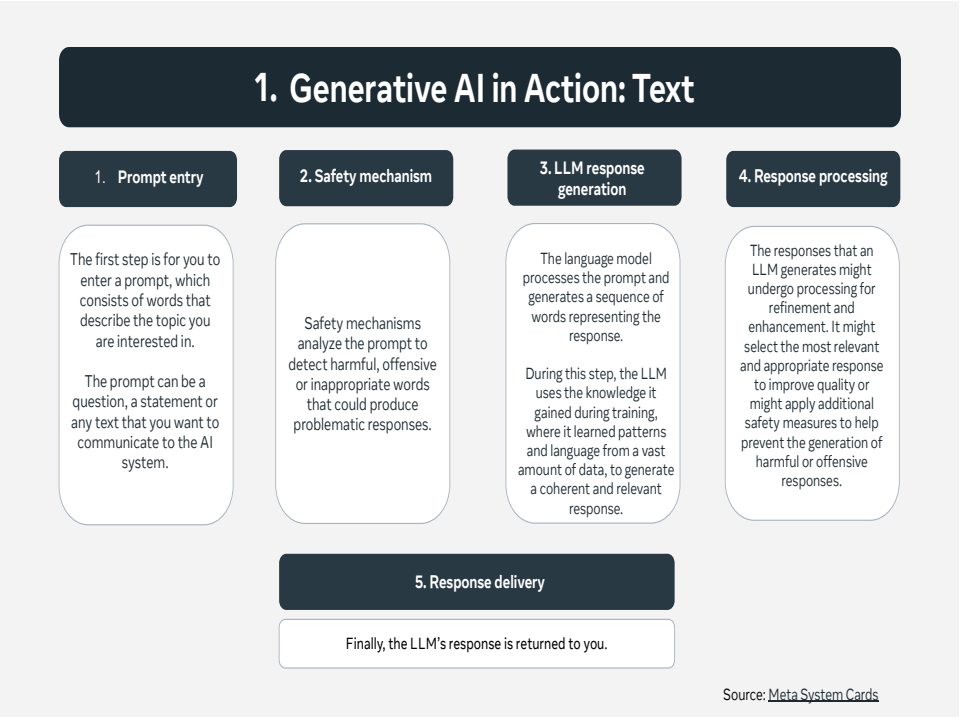


One type of artificial intelligence (AI) system is known as generative AI because people can use it to create something new, like images and text, based on descriptions or questions provided as prompts. The information here focuses on the type of AI system that may be used to generate text, including those you may use to interact with AI's.

AI systems that generate text rely on large language models (also called LLMs). LLMs learn language patterns from large amounts of text using a combination of machine learning and the guidance of people who help train the models. LLMs can perform a variety of language-based tasks such as completing a sentence or responding to questions in a conversational way.

There are multiple steps involved in this process, which are described below.

1. Prompt entry

The first step is for you to enter a prompt, which consists of words that describe the topic you are interested in. The prompt can be a question, a statement or any text that you want to communicate to the AI system.

1. Safety mechanisms

Safety mechanisms analyze the prompt to detect harmful, offensive or inappropriate words that could produce problematic responses.

2. LLM response generation

Next, your prompt is passed to the LLM for response generation. The language model processes the prompt and generates a sequence of words representing the response. During this step, the LLM uses the knowledge it gained during training, where it learned patterns and language from a vast amount of data, to generate a coherent and relevant response.

How does the LLM generate a response?

LLMs predict the word that is most likely to come next in a given sequence of words.

Typically, the second word of the LLM's response is generated by analyzing the prompt along with the predicted first word of the response. The LLM then analyzes the new sequence to predict the next word. This process is repeated until the complete response is formed.

The final response may vary even if the same prompt is used. This may be due to the intentionally dynamic nature of the LLM or because of the response processing step described below.

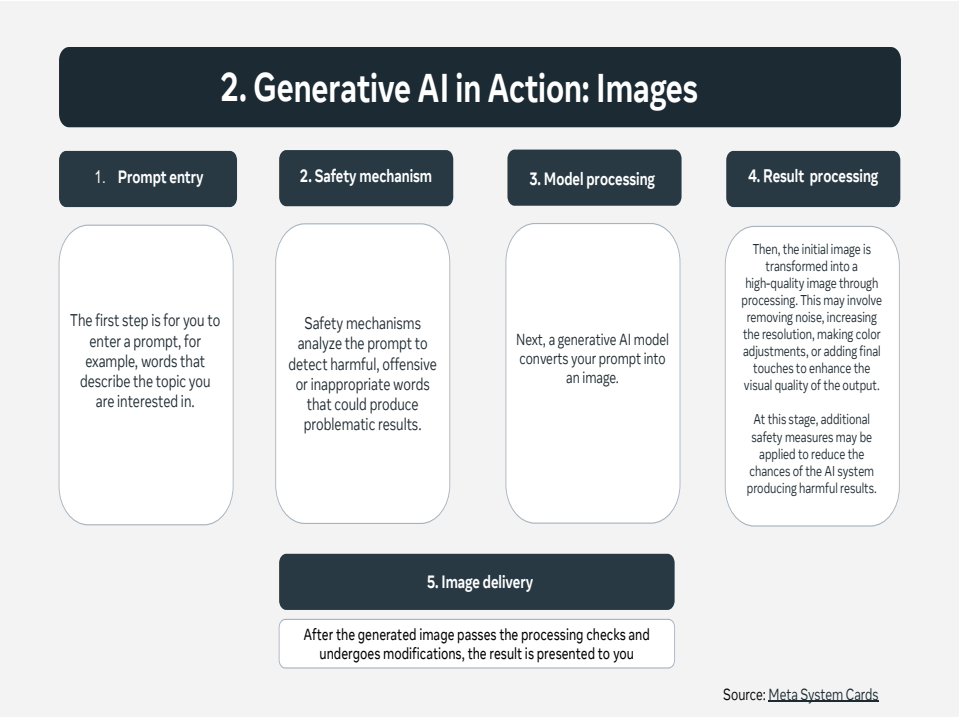
Note that some words in the prompt are more important for response generation than are others. To illustrate this point and to see how LLMs work, refer to the interactive demo below.

3. Response processing

The responses that an LLM generates might undergo processing for refinement and enhancement. For example, it might select the most relevant and appropriate response to improve quality. It also might apply additional safety measures to help prevent the generation of harmful or offensive responses.

1. Response delivery

Finally, the LLM’s response is returned to you.



AI systems that generate images typically rely on models that convert the words you provide as a prompt into an image. These models are trained by analyzing billions of images and their text captions (the descriptive text associated with the images). The model learns the association between these text descriptions and the images. After it's learned the associations, it can generate new images when you enter a text description of the image you want to see.

There are multiple steps involved in this process, which are described below.

1. Prompt entry

The first step is for you to enter a prompt, for example, words that describe the topic you are interested in.

2. Safety mechanisms

Safety mechanisms analyze the prompt to detect harmful, offensive or inappropriate words that could produce problematic results.

3. Model processing

Next, a generative AI model converts your prompt into an image.

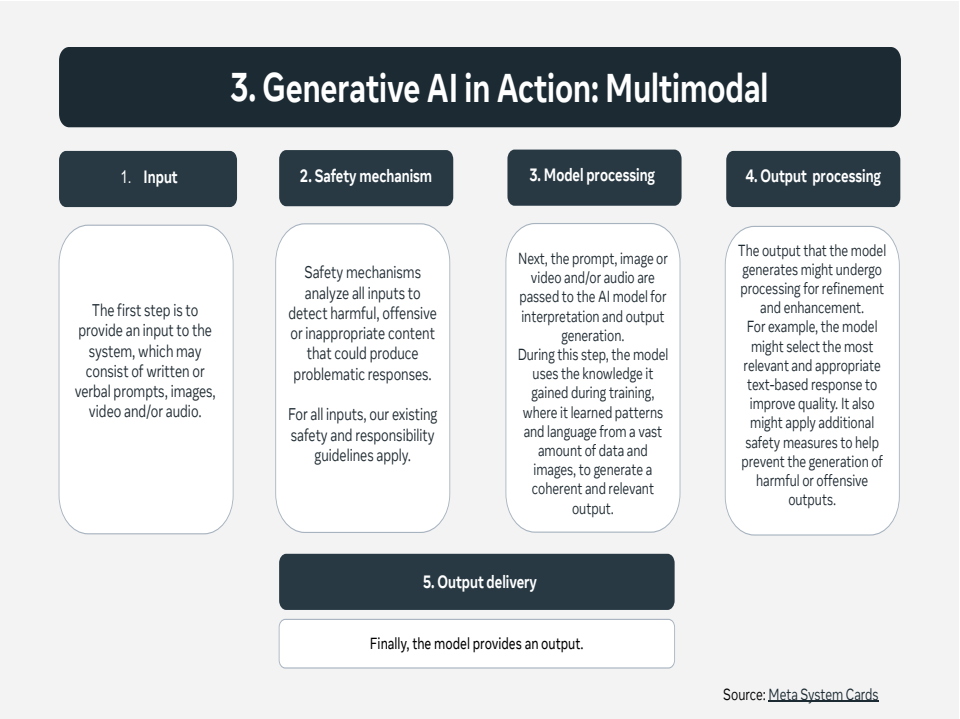
1. Result processing

Then, the initial image is transformed into a high-quality image through processing. This may involve removing noise, increasing the resolution, making color adjustments, or adding final touches to enhance the visual quality of the output.

At this stage, additional safety measures may be applied to reduce the chances of the AI system producing harmful results.

2. Image delivery

After the generated image passes the processing checks and undergoes modifications, the result is presented to you.



Multimodal generative AI systems typically rely on models that combine types of inputs, such as images, videos, audio, and words provided as a prompt. It then converts them into an output, which may also include text-based responses, images, videos and/or audio. These models are trained by analyzing large amounts of text and many images, videos or audio recordings. The models learn patterns and the association between text descriptions and corresponding images, video or audio recordings.

This process involves multiple steps, which are described below.

1. Input

The first step is to provide an input to the system, which may consist of written or verbal prompts, images, video and/or audio.

In the case of Ray-Ban Meta smart glasses, the device's AI system must be invoked, for example by saying "Hey Meta," followed by a prompt describing the question or topic you are interested in. For example, while looking at a tree you could say, "Hey Meta, look and tell me what kind of tree this is." This will trigger the glasses to take a photo and speech-recognition software to

convert your spoken words into text, which can be sent to the model.

1. Safety mechanisms

Safety mechanisms analyze all inputs to detect harmful, offensive or inappropriate content that could produce problematic responses. For all inputs, our existing safety and responsibility guidelines apply.

2. Model processing

Next, the prompt, image or video and/or audio are passed to the AI model for interpretation and output generation. In the case of Ray-Ban Meta smart glasses, the captured image and the text produced by spoken words are passed to the AI model.

During this step, the model uses the knowledge it gained during training, where it learned patterns and language from a vast amount of data and images, to generate a coherent and relevant output.

How does the model generate an output?

Each type of input (the prompt plus an image, video and/or audio) is processed and then combined to incorporate information from all input types.

For text output:

A language model predicts the word that is most likely to come next based on the combined information from the input.

Typically, the second word of the response is generated by analyzing the input along with the predicted first word of the response. The model then analyzes the new sequence to predict the next word. This process is repeated until the complete response is formed.

3. Output processing

The output that the model generates might undergo processing for refinement and enhancement. For example, the model might select the most relevant and appropriate text-based response to improve quality. It also might

apply additional safety measures to help prevent the generation of harmful or offensive outputs.

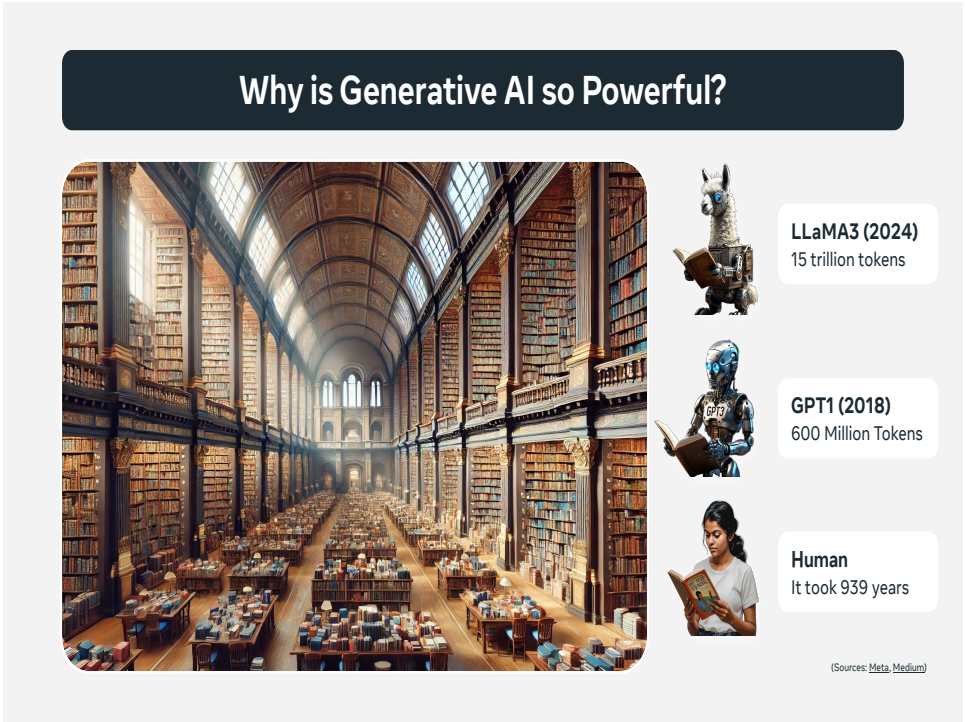
1. Output delivery

Finally, the model provides an output.

When using Ray-Ban Meta smart glasses, text-based responses are delivered in the accompanying app and through the speakers in the glasses. These, along with any images, are provided in the accompanying app.

Note that the output may vary even if the same inputs are used. This may be due to the intentionally dynamic nature of the model or because of the output processing step described above.

Also note that some words in the prompt or parts of the image, video or audio may be more important for output generation than are others. To illustrate this point and to see how this kind of generative AI model works, refer to the interactive demo below.



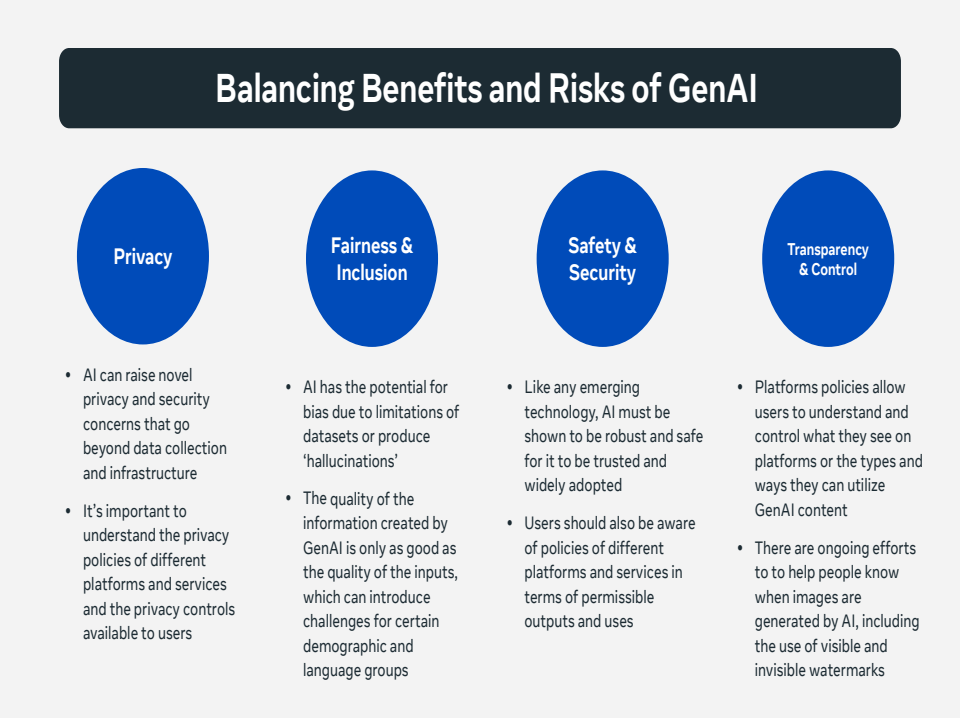
Generative AI has revolutionized the way we access and process information. By leveraging vast amounts of data, it can provide insights and knowledge that might be overlooked by humans.

Compared to human capabilities, generative AI can process information at an incredible speed. For instance, in 2018, GPT-1 was trained on a dataset of 600 million tokens. By 2024, Meta's LLaMA 3 has been trained on a staggering 15 trillion tokens, which is approximately 10,000 times more than GPT-1. To put this into perspective, 15 trillion tokens are roughly equivalent to about 210,000 books. If a human were to study this amount of material for 8 hours a day, it would take approximately 939 years to complete.

Generative AI has numerous applications across various fields, including healthcare, finance, education, and entertainment. Its ability to process complex tasks quickly makes it an invaluable tool for many industries.

Some of the key functions of generative AI include text generation, image creation, music composition, and video production. As this technology continues to evolve, its potential uses will only

continue to grow.



Generative AI is a powerful tool with significant impacts on our lives, from education to the workplace and home. While it offers benefits like creativity, productivity, and innovation, it also raises concerns about privacy, fairness, safety and transparency and disclosure.

Privacy

- AI can raise novel privacy and security concerns that go beyond data collection and infrastructure
- It's important to understand the privacy policies of different platforms and services and the privacy controls available to users

Fairness and Inclusion

- AI systems can perpetuate societal biases through their training data, leading to issues like negative stereotypes or erasure of identities. It's essential to respect privacy for sensitive demographic data while measuring and addressing potential fairness gaps.
- The quality of the information created by GenAI is only as good as the quality of the inputs, which can introduce

- challenges for certain demographic and language groups

Safety & security

- Like any emerging technology, AI must be shown to be robust and safe for it to be trusted and widely adopted
- Users should also be aware of policies of different platforms and services in terms of permissible outputs and uses

Transparency & Control

Rapid advances in AI have sparked excitement and concern. To address this, AI companies are implementing disclosure mechanisms to notify users when interacting with AI systems or content generated by AI. These mechanisms aim to promote transparency and help users differentiate between AI-generated and other content.

- Platforms policies allow users to understand and control what they see on platforms or the types and ways they can utilize GenAI content
- There are ongoing efforts to to help people know when images are generated by AI, including the use of visible and invisible watermarks

There are two types of disclosure mechanisms:

1. Direct Disclosures: User-facing disclosures that appear on the content or user interface, such as visible watermarks or text boxes explaining that the content is AI-generated.
2. Indirect Disclosures: Machine-readable signals embedded in the content itself, such as invisible watermarks or content provenance metadata. These signals help identify AI-generated content for journalists, platforms, and other actors.

Where can AI be used productively?

Medical

- Diagnosis and treatment
- Medical assistant
- Clinical data analysis
- Patient education
- Precision surgery
- Drug development

Manufacturing

- Demand forecasting
- Energy management
- Safety management
- Quality / inventory management

Finance

- Investment analysis
- Credit evaluation
- Customer service
- Financial product recommendations
- Automated trading
- Fraud detection

Agriculture

- Yield prediction
- Pest and disease detection
- Soil analysis
- Farm robot coordination
- Disaster preparedness

Public

- Public opinion collection
- Policy data analysis
- Complaint handling
- Crime prediction
- Disaster response
- Epidemic prediction

Smart City

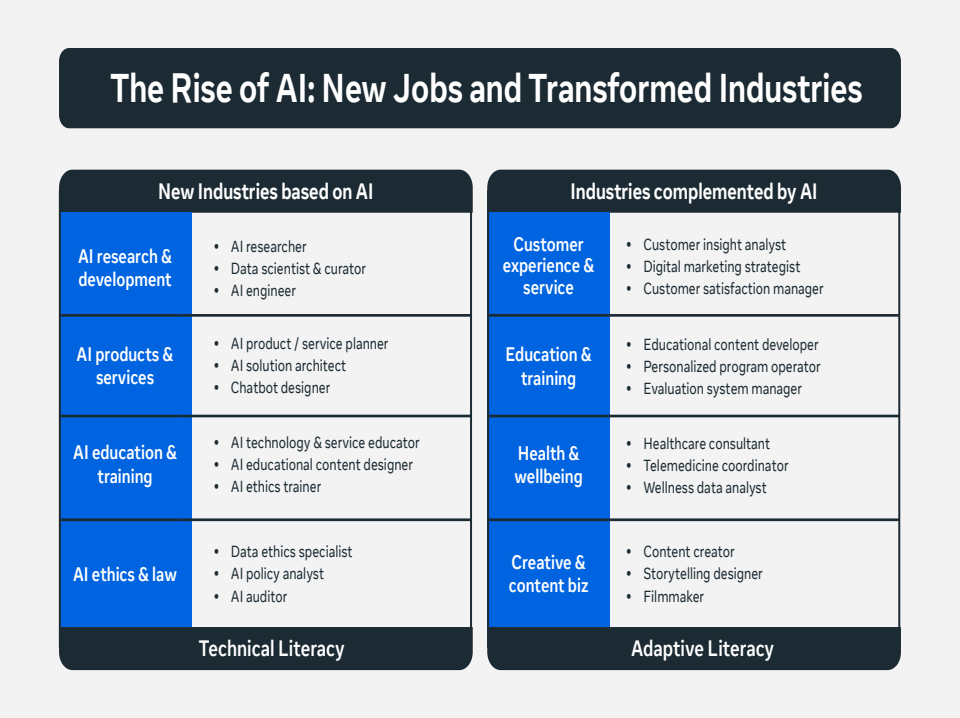
- Traffic management
- Urban energy management
- Security systems
- Waste collection optimization
- Public service automation

Space Industry

- Space debris tracking and avoidance
- Onboard food cultivation
- Wastewater and drinking water management

Environment

- Climate modeling
- Ecosystem protection
- Air quality monitoring
- Water quality management
- Soil health analysis
- Resource management optimization



The Rise of AI: New Jobs and Transformed Industries
Artificial intelligence (AI) is revolutionizing various industries, creating new jobs and transforming existing ones. This evolution has given rise to new roles across two main categories: industries directly related to AI and industries that have been transformed and enhanced by AI.

Industries Directly Related to AI

New professions have emerged in AI research and development, including:

- AI researchers
- Data scientists and curators
- AI engineers

These professionals develop and improve AI technologies, analyze data, and design and implement AI systems.

Industries Transformed and Enhanced by AI
AI has created new roles in various industries, including:

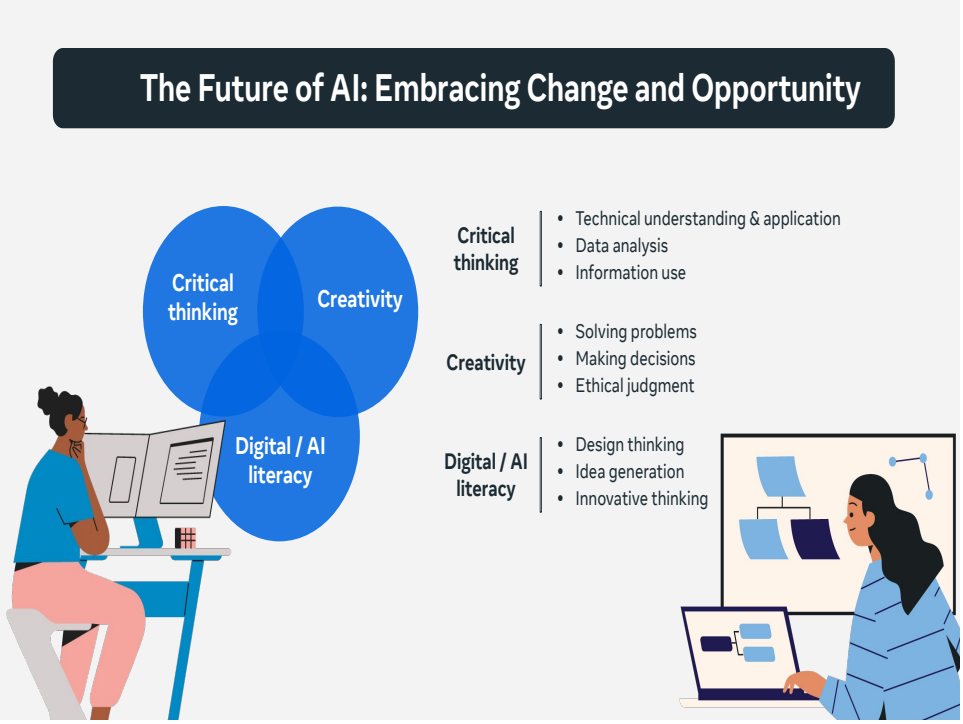
- Customer experience and service

- Education and training
- Health and wellbeing
- Creative and content business

Professionals in these fields use AI to analyze customer data, develop educational content, provide healthcare solutions, and generate new content.

Key Skills for the AI Era

To adapt to these changes, it's essential to acquire both technical skills (e.g., data analysis, AI model development) and adaptive skills (e.g., creative thinking, problem-solving, ethical judgment). Embracing AI as a powerful tool can unlock new opportunities and drive human progress forward.



As artificial intelligence (AI) continues to evolve, it's natural to have concerns about its impact on our lives. However, it's essential to recognize that AI is a tool, not a threat. By understanding its potential and limitations, we can harness its power to drive progress and innovation.

A Historical Perspective

The introduction of new technologies has always been met with a mix of excitement and apprehension. The advent of automobiles, for example, raised concerns about job losses and safety issues. However, as the technology improved and became more accessible, it brought numerous benefits, including increased productivity and social mobility.

The Benefits of AI

Similarly, AI has the potential to bring significant benefits to various industries and aspects of our lives. It can:

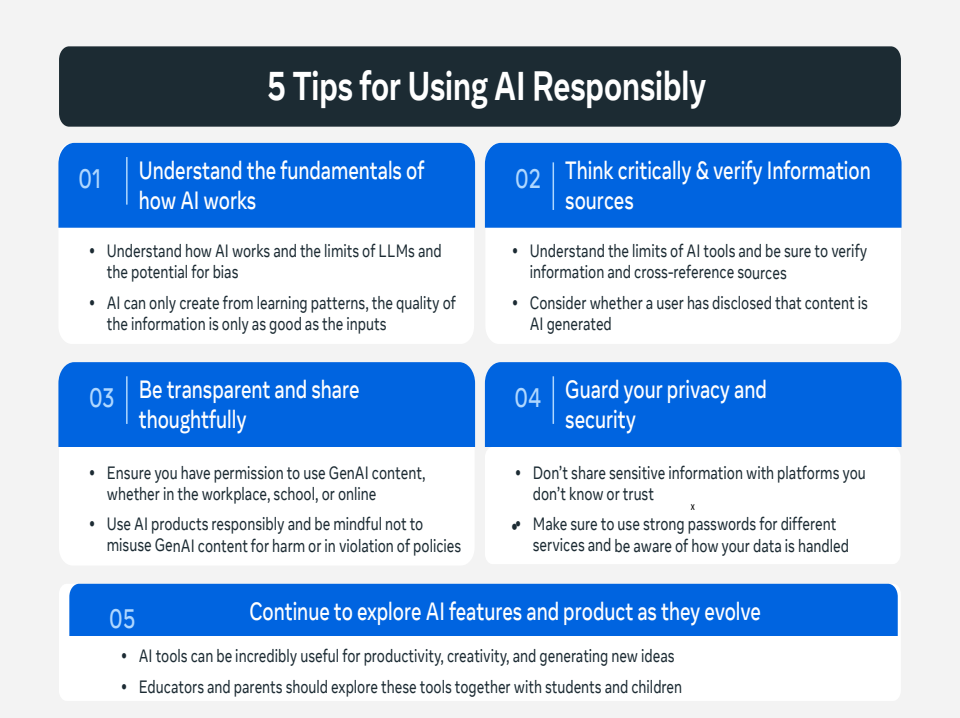
* Enhance productivity and efficiency
* Improve decision-making and problem-solving
* Provide personalized experiences and services

* Drive innovation and creativity

Embracing the Future of AI

To fully realize the benefits of AI, it's essential to understand its potential and limitations. We must also develop the skills necessary to work effectively with AI systems, including critical thinking, creativity, and digital literacy.

By embracing AI as a tool, rather than a threat, we can unlock its full potential and drive progress in various aspects of our lives.



1. Understand the fundamentals
   - Understand how AI works and the limits of LLMs and the potential for bias
   - AI can only create from learning patterns, the quality of the information is only as good as the inputs

2. Think critically and verify information sources
   - Understand the limits of AI tools and be sure to verify information and cross-reference sources
   - Consider whether a user has disclosed that content is AI generated

3. Be transparent and share thoughtfully
   - Ensure you have permission to use GenAI content, whether in the workplace, school, or online
   - Use AI products responsibly and be mindful not to misuse GenAI content for harm or in violation of policies

4. Guard your privacy and security
   - Don’t share sensitive information with platforms you don’t know or trust
   - Make sure to use strong passwords for different services and be aware of how your data is handled

5. Continue to explore AI features and products as they evolve
   - AI tools can be incredibly useful for productivity, creativity, and generating new ideas
   - Educators and parents should explore these tools together with students and children

CDL, Center for Digital Literacy

Thank you

In partnership with:

Meta | WE THINK DIGITAL