Microsoft

Shaping the New AI Economy and Its Regulatory Framework

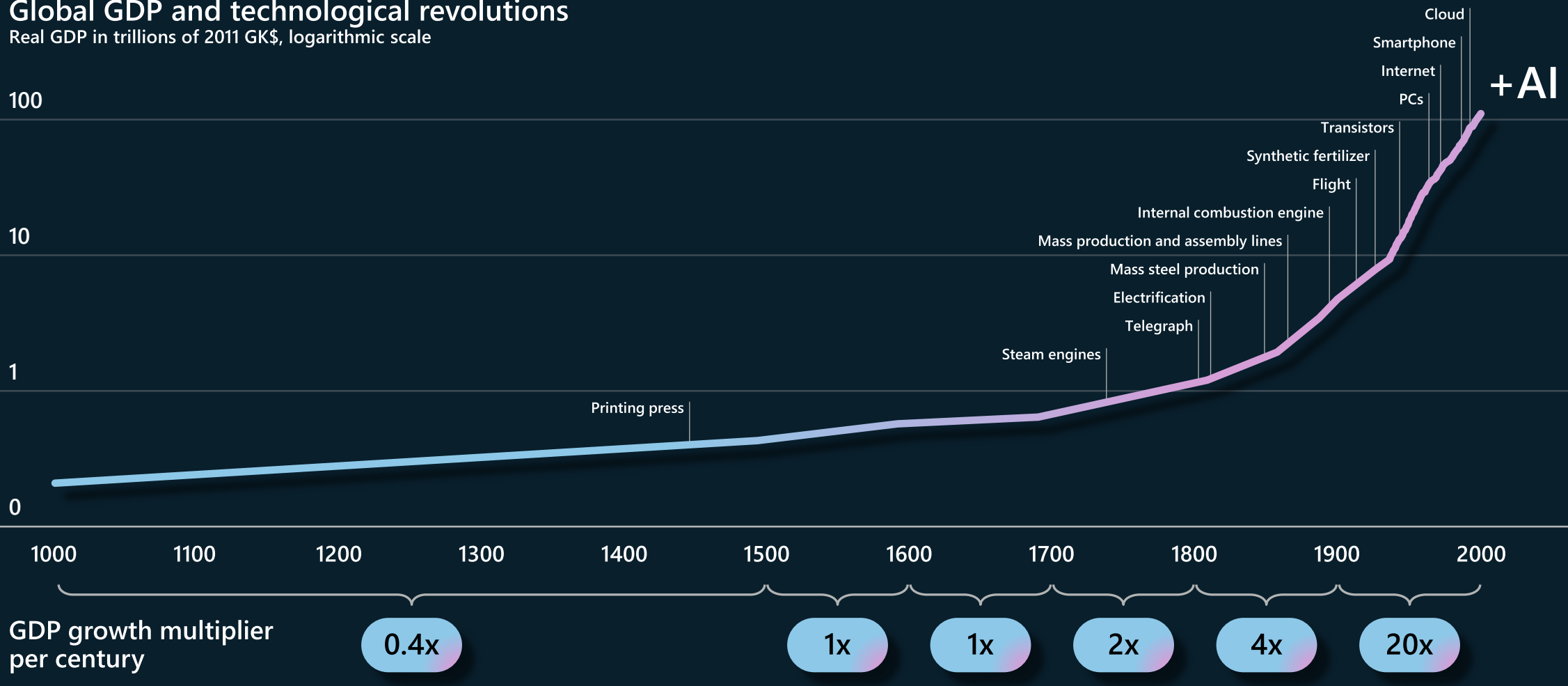
Alex Pessó, Microsoft Legal Director for Chile and Perú



Technology drives GDP growth, and the pace of change is accelerating

Global GDP and technological revolutions

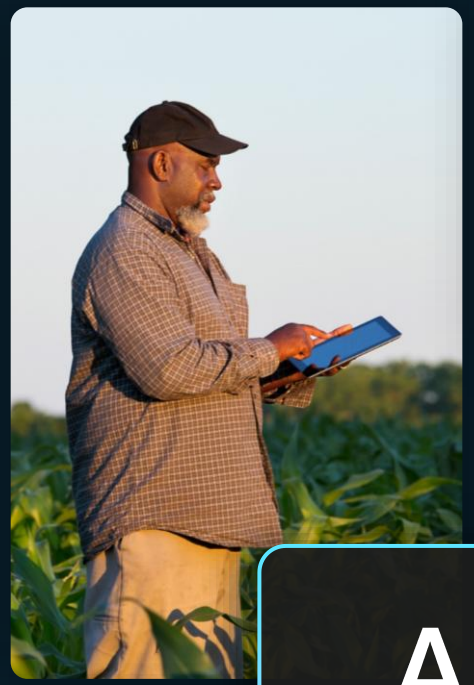
Real GDP in trillions of 2011 GK$, logarithmic scale



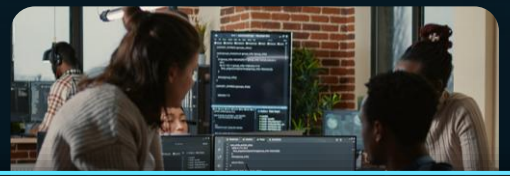
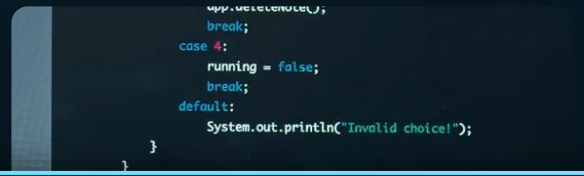
GDP growth multiplier per century

0.4x	1x	1x	2x	4x	20x

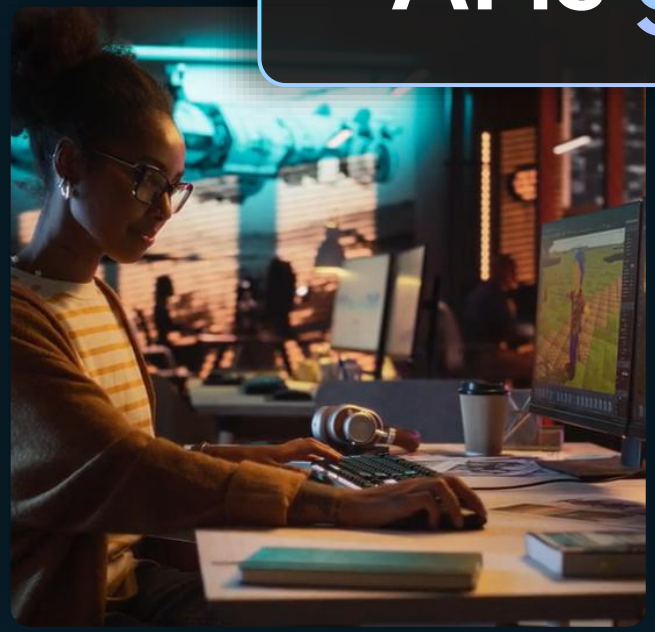
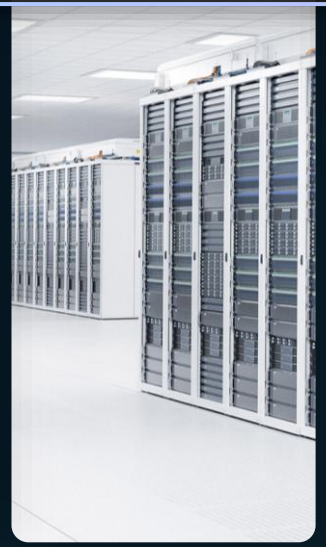
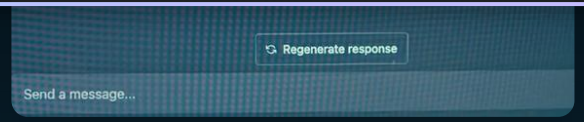
Source: Maddison Project, Ourworldindata

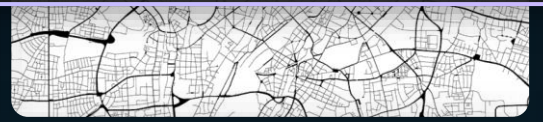


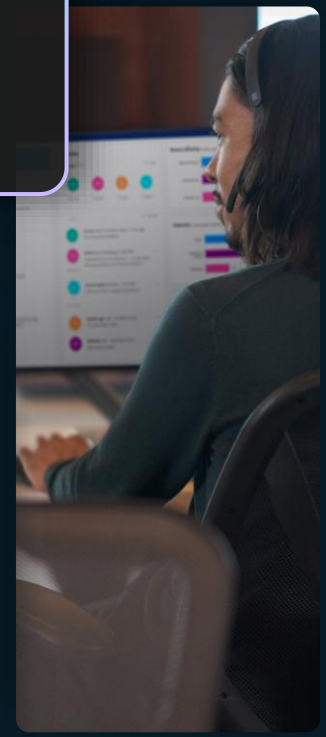


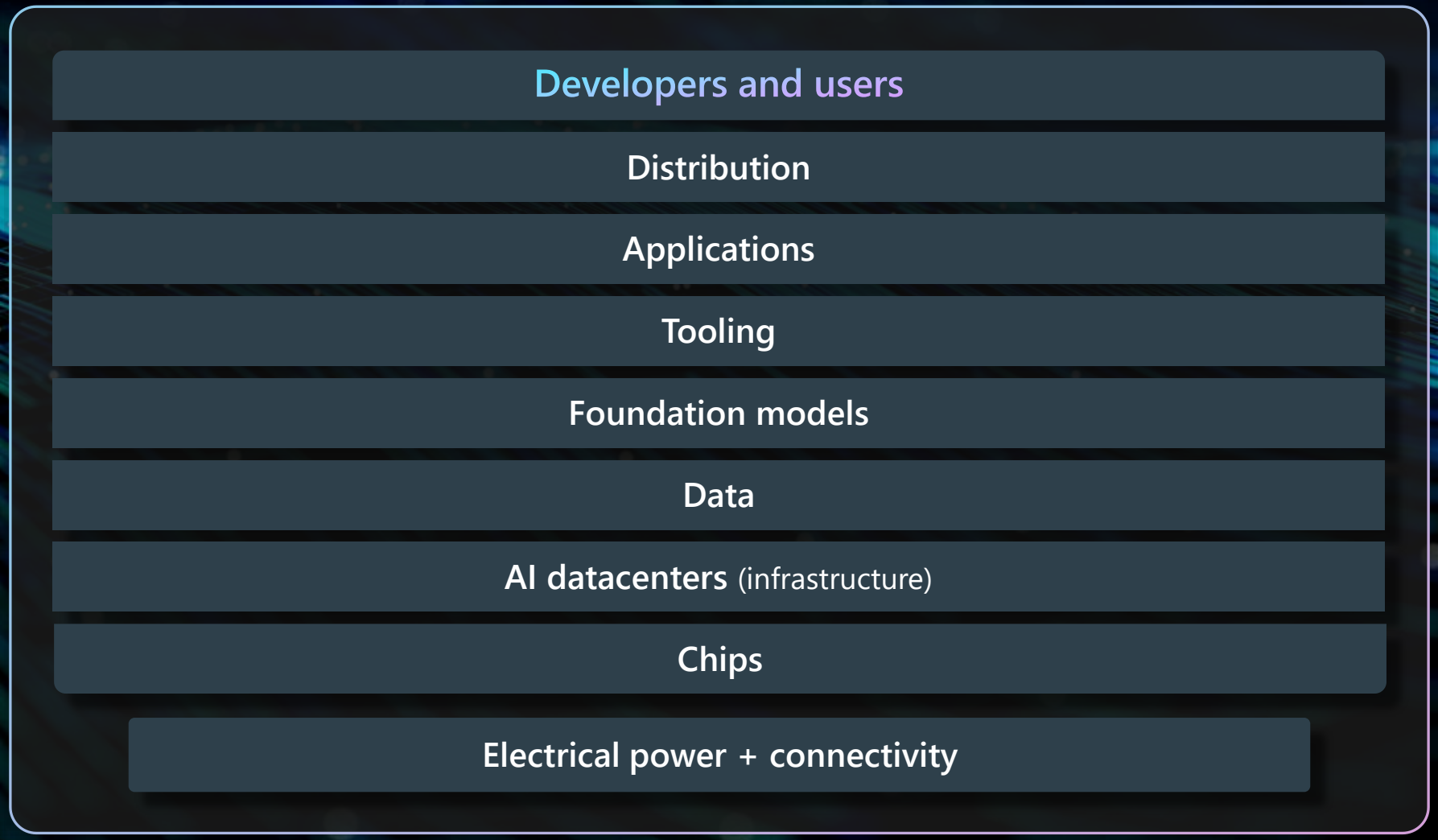
AI is general purpose technology



The Tech Stack for AI



The New AI Economy

Chips



AI datacenters



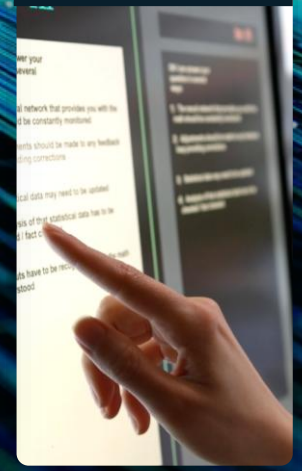
Data



Foundation models



Tooling



Applications



Distribution



Developers and users



Electrical power + connectivity

Different regulatory models

Different points of intervention across the tech stack

A common set of concerns

Key priorities for the evolving AI policy landscape



Risk-based approach

Governance frameworks that differentiate between high- and low-risk scenarios to support innovation and provide protection where it's needed most



Regulatory architecture that matches technology architecture

Laws that reflect the relevant layers of the AI technology stack and distribute responsibility along the AI value chain appropriately



Advancing AI measurement and science

Create risk-based definitions, processes, and standards for AI systems that can inform regulatory and legislative frameworks



Ensure a centralized and optimized application

Streamline the roles and responsibilities of enforcement agencies; avoid double regulation and rely on existing laws as much as possible;

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The Data and AI Opportunity

Healthcare/life-science

- Enhanced diagnosis and personalized treatment
- Drug discovery: Cancer; Infectious diseases like HIV, hepatitis, COVID-19, and influenza; and neurodegenerative diseases like Alzheimer's and Parkinson's

Climate change

- Enhanced climate models via analysis of data from sensors and satellites
- Risk assessment: Assess and predict impacts of climate change on infrastructure, ecosystems, and human populations, and develop adaptation and mitigation strategies

Agriculture

- Crop breeding: Pest, disease, climate-resistant
- Precision Ag: Optimize fertilizer, pesticide, H2O
- Food-safety: Detect/prevent food-borne illness via microbial data analysis and identifying contamination patterns

Education

- Personalized education via custom learning materials tailored to students' individual needs and learning styles
- Identify at-risk students and provide targeted interventions to improve academic outcomes

Materials science

- Superconductivity: Zero resistance at high temperatures > more efficient power grids
- High-strength: Stronger, lighter, more durable products – Aircraft, vehicles, buildings, bridges
- Self-healing: Medical devices

Finance

- Predict market trends, optimize trading/investment strategies
- Detect fraud and other financial crimes
- Risk assessment
- Personalized advice

Social justice

- Reduce bias and discrimination by analyzing large datasets to identify discrimination patterns
- Develop fairer hiring and promotion practices
- Identify and address systemic inequalities in housing, lending, healthcare

Energy

- Optimize energy consumption and reduce waste
- Carbon capture and storage: Generative AI can help identify new materials and technologies for capturing and storing carbon emissions from power plants and industrial processes

Creative expression

- Help writers, artists, and musicians create new and innovative works by providing them with inspiration and ideas
- Generate new designs for products and buildings, and optimize layout and functionality of cities and public spaces

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Data Inputs for AI Training

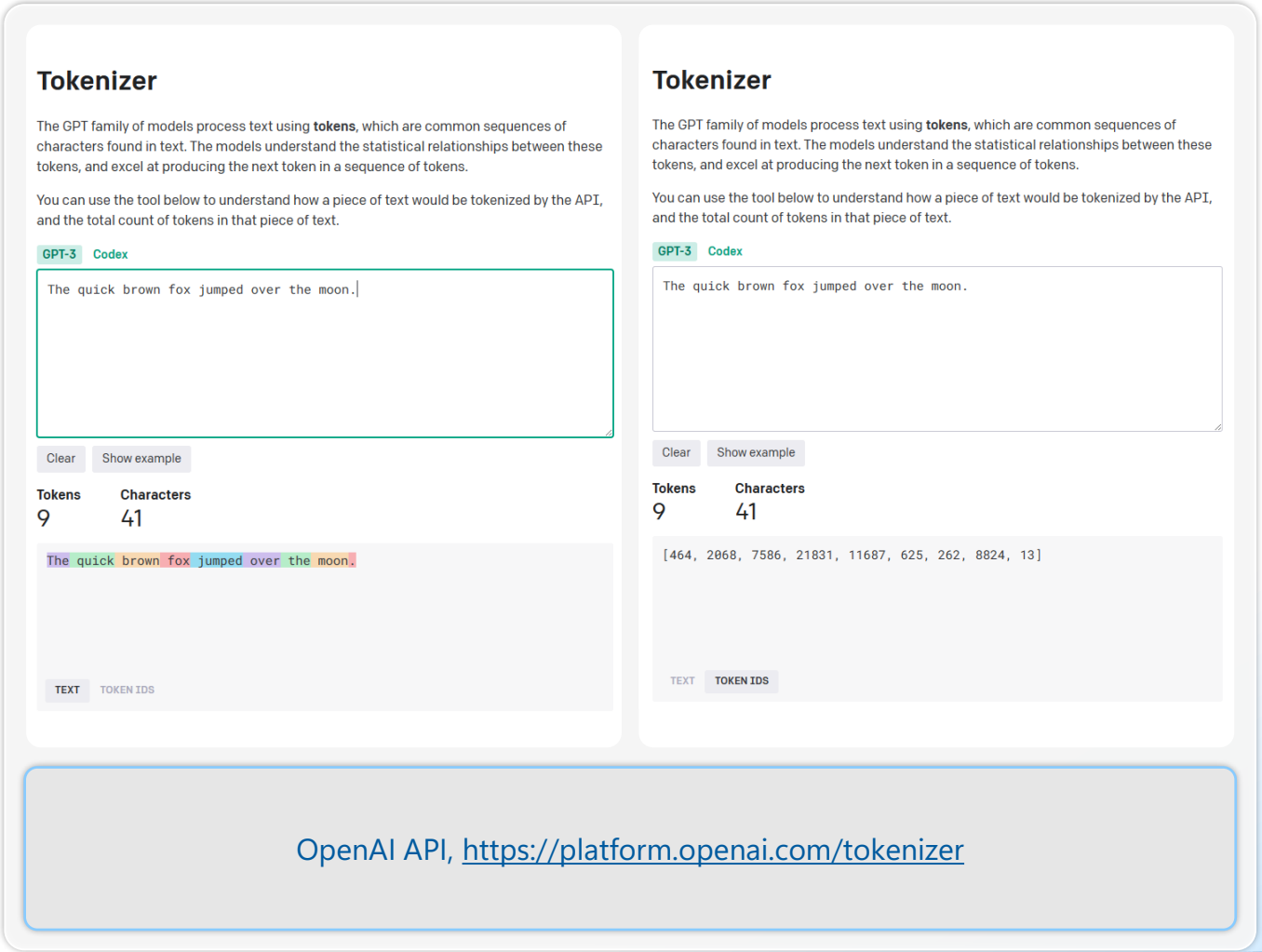
An AI model is trained by analyzing large amounts of data

This training data is input to a neural network as “tokens“, where the network takes the input as numbers

The network self-adjusts until the output shows that the model has learned patterns and can make predictions based on those patterns

This process is called self-supervised learning and can derive insights even if the data does not have human-created labels

Once the model is created, it no longer uses the training data to perform its tasks



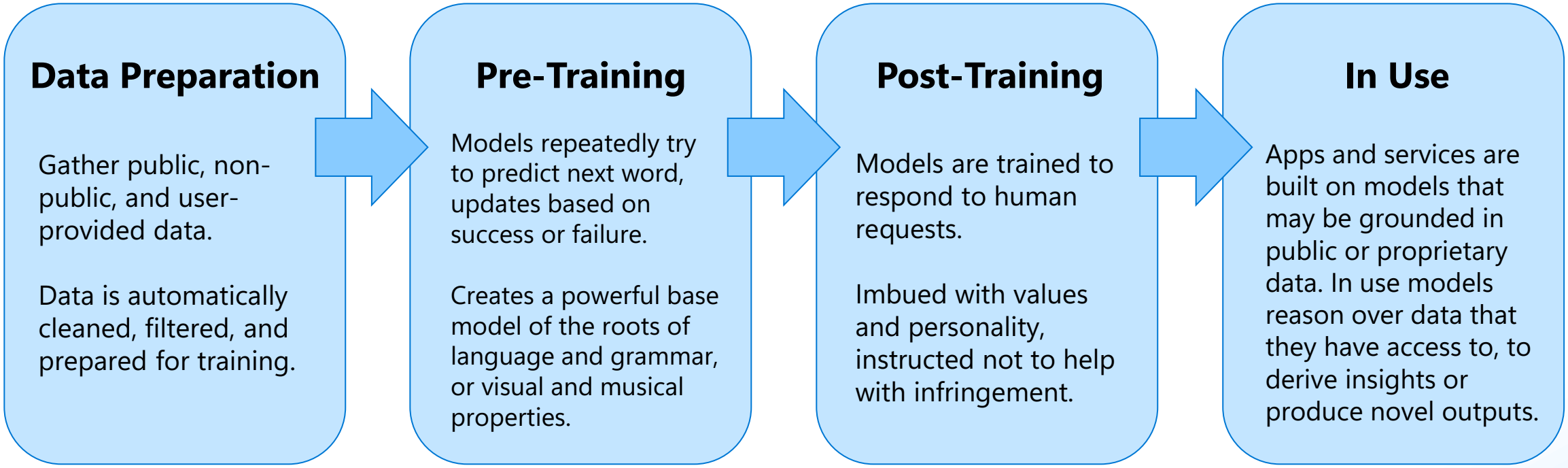
OpenAI API, https://platform.openai.com/tokenizer

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Data In the Model Development & Deployment Lifecycle

Grounding: find relevant, external sources of information that are not part of the LLM's training data.

Fine-tuning: training the pre-trained, base model on specific dataset.



Models are <u>not</u> a database, and do not continuously access training data.

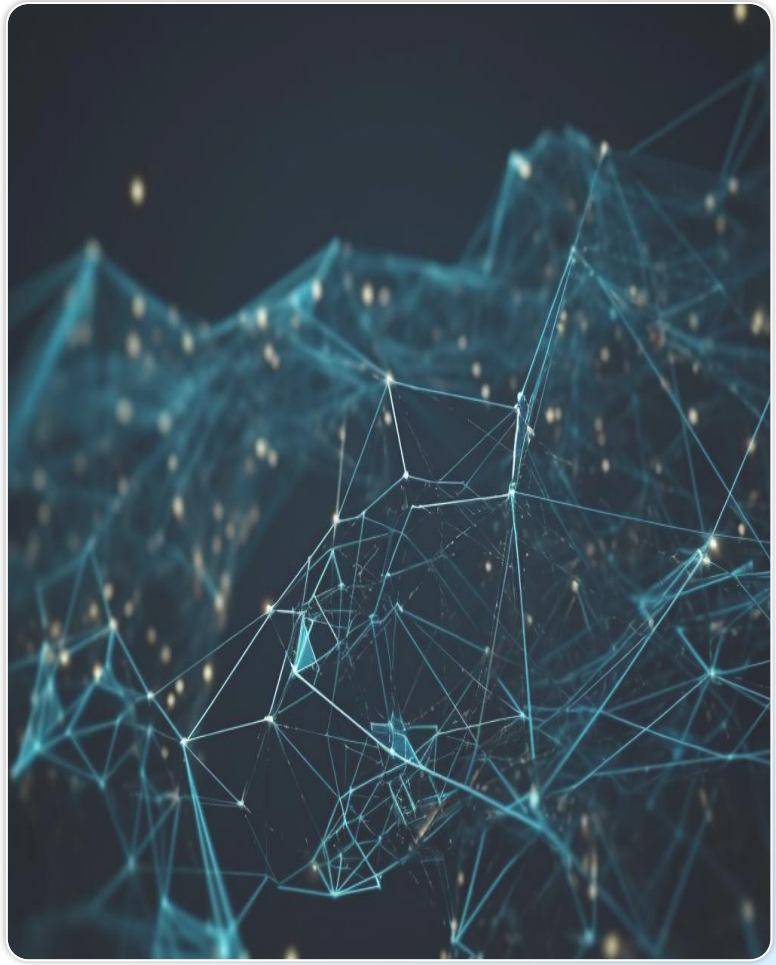
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Access to Data – the 3 Key Factors

Scale – The capabilities of large-scale AI models is generally proportional to the scale of data analysed during training.

Variety – Large amounts of varied data are essential to ensure that AI models are accurate, mitigate bias, and inclusive.

Fairness – For any organization to develop, fine tune and use AI, they need access to data.



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Copyright Modernization in the Age of Data and Generative AI

Principles of Copyright Law

- Copyright law promotes the twin goals of rewarding creative endeavors and promoting access to information and innovation.
- The benefits afforded rightsholders are designed to encourage the development of new works and bring new knowledge to the public…but this should not be at the expense of innovation or the public's right to learn from these works.
- Article 9(2) of TRIPS Agreement presents that threshold clearly: "Copyright protection shall extend to expressions and not to ideas, procedures, methods of operations or mathematical concepts as such."
- Yet a lack of legal clarity, especially around the analysis of publicly available data, can stifle opportunities to innovate.

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Text and Data Mining Exceptions & Existing Models

Text and Data Mining (TDM) means any automated analytical technique aimed at analysing text and data in digital form to generate information which includes but is not limited to patterns, trends and correlations.

- Provides legal clarity that TDM is not a copyright infringing activity.
- Enables data to be accessed for TDM at **scale**, from a **broad variety** of sources, **fairly** by everyone.
- Existing Models:
  - European Union – Articles 3 & 4
  - United States – Fair Use Doctrine (Israel, South Korea, Taiwan…)
  - Japan –data analysis is not considered an "exploitation of the work for enjoyment of the thoughts or sentiments expressed in the copyrighted work."
  - Singapore - exception for making and retaining copies of lawfully accessed works for purposes of computational data analysis.

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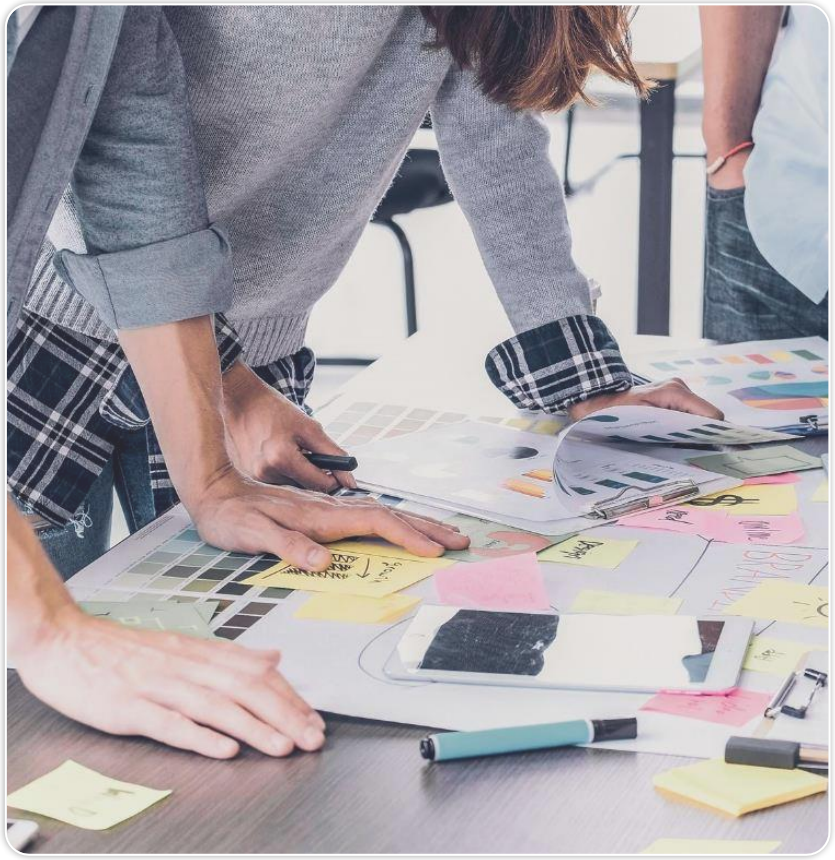
TDM Exception are not Unfriendly to Copyright Holders

- Copyright law provides robust remedies that are not displaced because of a TDM exception.
  - Claims remain available against the outputs.
- Conditions associated with a codified TDM:
  - Lawful access
  - Prohibition on the transfer of the work to another person
  - Unreasonably prejudice the interest of the copyright owner

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Our Approach to AI Model Development

Our Approach with Data…

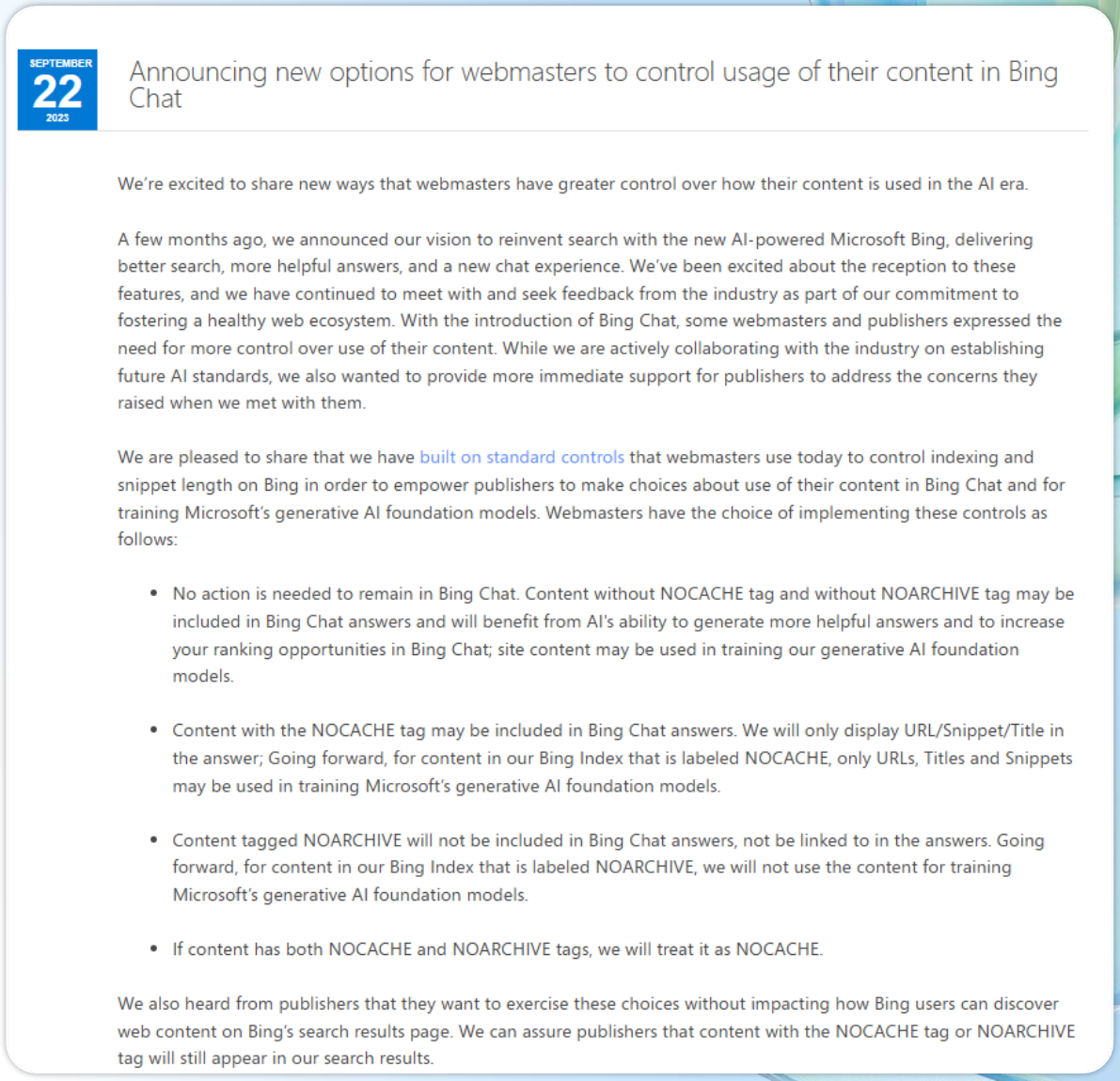


- Use data from multiple sources:
  - Publicly Available
  - Acquired
  - First Party Data
  - Synthetic Data; and
  - Human Feedback
- Exclude sources with paywalls, sources that contain content that violates our policies, and sources that have opted-out of training using web controls
- We do not train on data from domains listed in the Office of the United States Trade Representative (USTR) Notorious Markets for Counterfeiting and Piracy list.
- Honor Robots.txt Protocol

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Provide Copyright Holders' Agency and Choice

Web publishers have options to prevent the use of their content for training Microsoft's generative AI models, while still making their content available in Bing search



SEPTEMBER 22 2023

Announcing new options for webmasters to control usage of their content in Bing Chat

We're excited to share new ways that webmasters have greater control over how their content is used in the AI era.

A few months ago, we announced our vision to reinvent search with the new AI-powered Microsoft Bing, delivering better search, more helpful answers, and a new chat experience. We've been excited about the reception to these features, and we have continued to meet with and seek feedback from the industry as part of our commitment to fostering a healthy web ecosystem. With the introduction of Bing Chat, some webmasters and publishers expressed the need for more control over use of their content. While we are actively collaborating with the industry on establishing future AI standards, we also wanted to provide more immediate support for publishers to address the concerns they raised when we met with them.

We are pleased to share that we have built on standard controls that webmasters use today to control indexing and snippet length on Bing in order to empower publishers to make choices about use of their content in Bing Chat and for training Microsoft's generative AI foundation models. Webmasters have the choice of implementing these controls as follows:

- No action is needed to remain in Bing Chat. Content without NOCACHE tag and without NOARCHIVE tag may be included in Bing Chat answers and will benefit from AI's ability to generate more helpful answers and to increase your ranking opportunities in Bing Chat; site content may be used in training our generative AI foundation models.
- Content with the NOCACHE tag may be included in Bing Chat answers. We will only display URL/Snippet/Title in the answer; Going forward, for content in our Bing Index that is labeled NOCACHE, only URLs, Titles and Snippets may be used in training Microsoft's generative AI foundation models.
- Content tagged NOARCHIVE will not be included in Bing Chat answers, not be linked to in the answers. Going forward, for content in our Bing Index that is labeled NOARCHIVE, we will not use the content for training Microsoft's generative AI foundation models.
- If content has both NOCACHE and NOARCHIVE tags, we will treat it as NOCACHE.

We also heard from publishers that they want to exercise these choices without impacting how Bing users can discover web content on Bing's search results page. We can assure publishers that content with the NOCACHE tag or NOARCHIVE tag will still appear in our search results.

Announcing new options for webmasters to control usage of their content in Bing Chat | Bing Webmaster Blog

Mitigating Unwanted Outputs from an IP Perspective

Our Approach: mitigate the risk of near identical outputs

Our Measures:

- Meta-prompts & Filters
- Blocklists
- Prompt transformation for text to image models
- Classifiers
- User Policies
- Customer Copyright Commitment (Enterprise Customers)

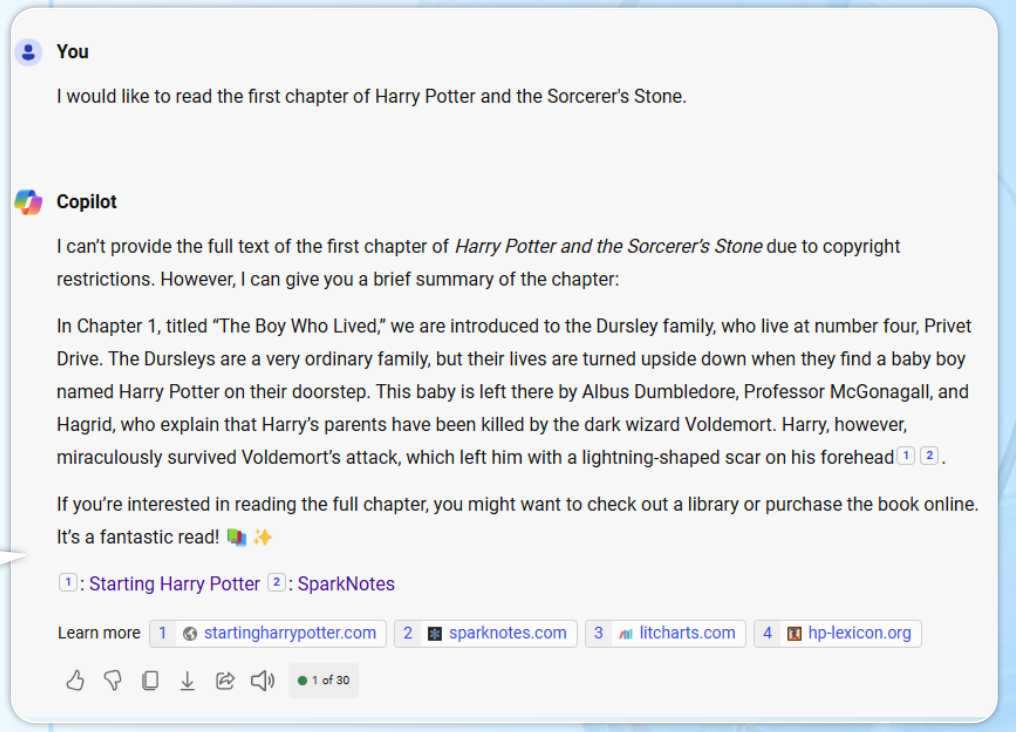


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How Microsoft encourages responsible use of our tools

We use metaprompts and filters to reduce the risk of infringement

The metaprompts are used to align responses with Microsoft's AI Principles and user expectations



Bing Chat declined to reproduce a copyrighted work

Note: These mitigations can give different results depending on the context due to the predictive nature of how answers are generated.

Learn more at The new Bing - Our approach to Responsible AI (microsoft.com).

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Microsoft Image Creator: Addressing artists concerns

We allow living artists to report their name to us for limiting the creation of images associated with their names

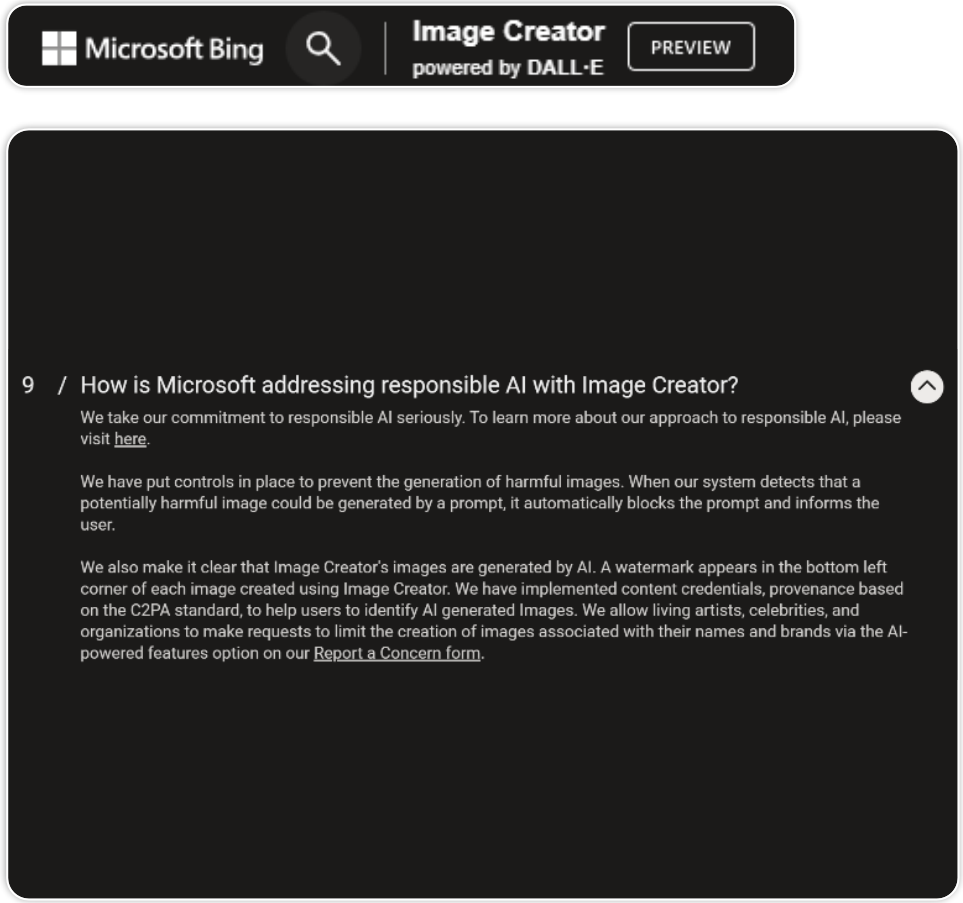


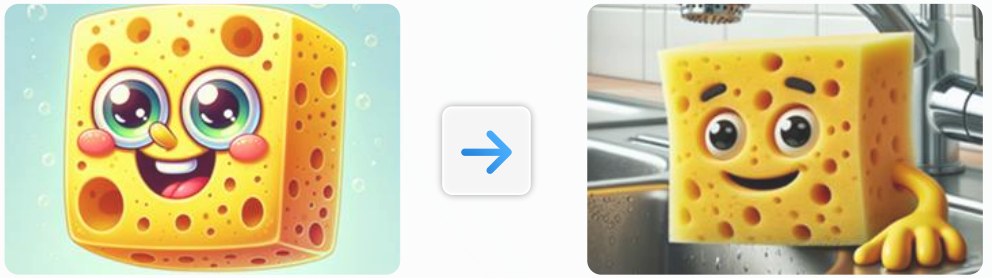
Image Creator from Microsoft Designer (bing.com)

Prompt Re-Interpretation

Enterprise offering that aims to prevent outputs that closely resemble certain types of known creative content, such as studio characters and contemporary artwork

User's text prompts are re-interpreted to remove keywords or phrases associated with certain categories

"Draw an animated sponge"



https://techcommunity.microsoft.com/t5/ai-azure-ai-services-blog/announcing-key-updates-to-responsible-ai-features-and-content/ba-p/4142730

Thank you!

Microsoft