

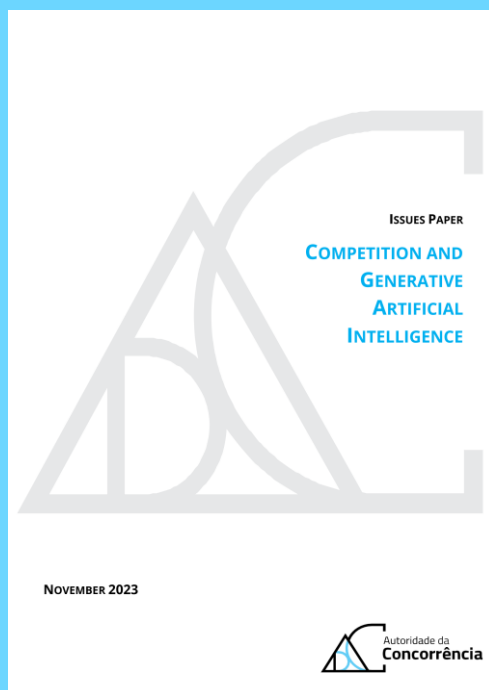


Competition and Generative Artificial Intelligence

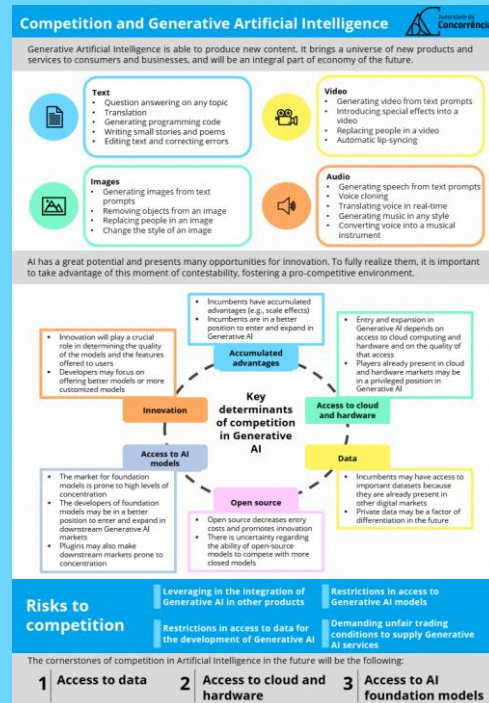
Autoridade da Concorrência

17 April 2024

AdC's Issues Paper on Competition and Generative Artificial Intelligence



<https://www.concorrenca.pt/sites/default/files/documentos/Issues%20Paper%20-%20Competition%20and%20Generative%20Artificial%20Intelligence.pdf>



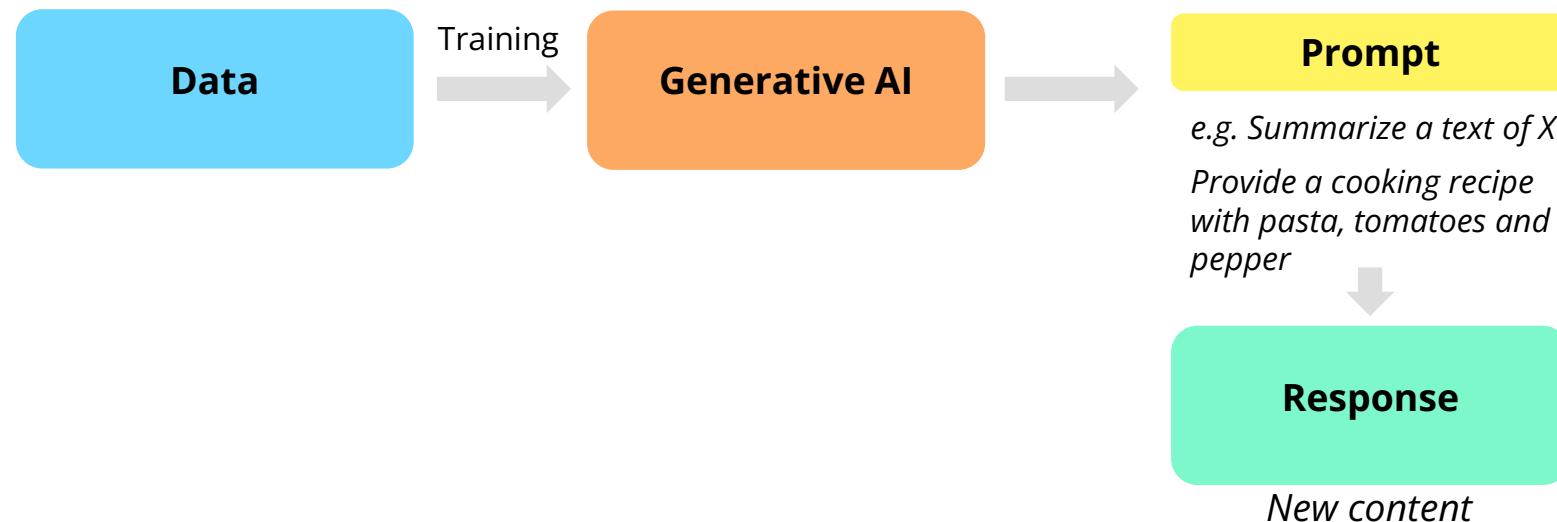
<https://www.concorrenca.pt/sites/default/files/processos/epr/One-pager-Concorr%C3%Aancia%2Be%2BIA%2BGenerativa.pdf>

November 2023

- The AdC published an **Issues Paper** on competition issues raised by Generative Artificial Intelligence (Generative AI)
- The AdC mapped the key determinants of competition in Generative AI and identifies the main **risks to competition** in the sector.

01 What is Generative Artificial Intelligence?

- **Generative AI** is **artificial intelligence** capable of producing **new content**, much like a human would do, but at scale, including text, images, video and audio.
- This technology captures patterns in the information used for its training and is then able to replicate them.



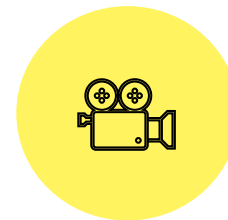
01 What is Generative Artificial Intelligence?

- **Generative AI** can generate diverse types of content via many tasks:



Text

- Question answering on any topic
- Translation
- Generating programming code
- Writing small stories and poems
- Editing text and correcting errors



Video

- Generating video from text prompts
- Introducing special effects into a video
- Replacing people in a video
- Automatic lip-syncing



Images

- Generating images from text prompts
- Removing objects from an image
- Replacing people in an image
- Change the style of an image (e.g., from realistic to animation)



Audio

- Generating speech from text prompts
- Voice cloning
- Translating voice in real-time
- Generating music in any style
- Converting voice into a musical instrument

01 What is Generative Artificial Intelligence?



Text (ChatGPT (GPT-4) – ChatGPT - OpenAI)

Prompt:

List and briefly explain in bullet points and in few sentences the most noteworthy competition cases in digital markets in the EU.

Response:

1. Google Search (Shopping) Case (2017): In this case, the European Commission fined Google €2.42 billion for abusing its dominance as a search engine by giving an illegal advantage to its own comparison shopping service. It was ruled that Google had systematically given prominent placement to its own comparison shopping service and demoted rival comparison shopping services in its search results.

2. Google Android Case (2018): The European Commission imposed a fine of €4.34 billion on Google for illegal restrictions on Android device manufacturers and mobile network operators. The restrictions were aimed at cementing Google's dominant position in general internet search, which the EU determined was a violation of competition law.

3. Facebook and WhatsApp Merger (2014): The European Commission approved Facebook's acquisition of WhatsApp under the EU Merger Regulation. This was a significant case because it highlighted the importance of potential competition in digital markets. In 2017, the EC fined Facebook €110 million for providing incorrect or misleading information during the merger process about its ability to match Facebook and WhatsApp user accounts.

4. Apple and Ireland Tax Case (2016): The European Commission ruled that Ireland had given illegal tax benefits to Apple, allowing the company to pay substantially less tax than other businesses. This wasn't specifically a competition case, but it had significant implications for large tech companies operating in the EU.

5. Amazon E-book Antitrust Case (2017): Amazon agreed to change its e-book contracts with publishers to allow for more competition in response to an investigation by the European Commission. The case centered around clauses in Amazon's contracts that required publishers to inform the company about more favorable or alternative terms offered to Amazon's competitors, a potential breach of EU antitrust rules.

6. Google AdSense Case (2019): The European Commission fined Google €1.49 billion for abusive practices in online advertising. It was concluded that Google had placed restrictive clauses in contracts with third-party websites which prevented Google's rivals from placing their search adverts on these websites.

7. Amazon Dual Role Case (ongoing as of my last training cut-off in 2021): The European Commission is investigating Amazon's dual role as a marketplace for merchants and a competitor selling products on the same platform. The concern is that Amazon could be using non-public marketplace data to unfairly compete with other sellers.

8. Apple App Store Case (ongoing as of 2021): The European Commission is investigating Apple's App Store practices for potentially anti-competitive behavior. The investigation follows a complaint from Spotify and an e-book/audiobook distributor on the impact of the App Store rules on competition in music streaming and e-books/audiobooks.

Please note that my training only goes up to September 2021, so there may have been updates or new cases since then.

01 What is Generative Artificial Intelligence?



Images (created using the Dall-E 3 plugin in ChatGPT – OpenAI)

Prompt

Alice, from Alice in the Wonderland, approaching the main door of Dracula's Castle. Different styles for each image: 3D Pixar, photorealistic, animated and painting.



Response



01 What is Generative Artificial Intelligence?

- Some use cases of **Generative AI**:

Identifying anomalies and fraud

Optimising customer support services

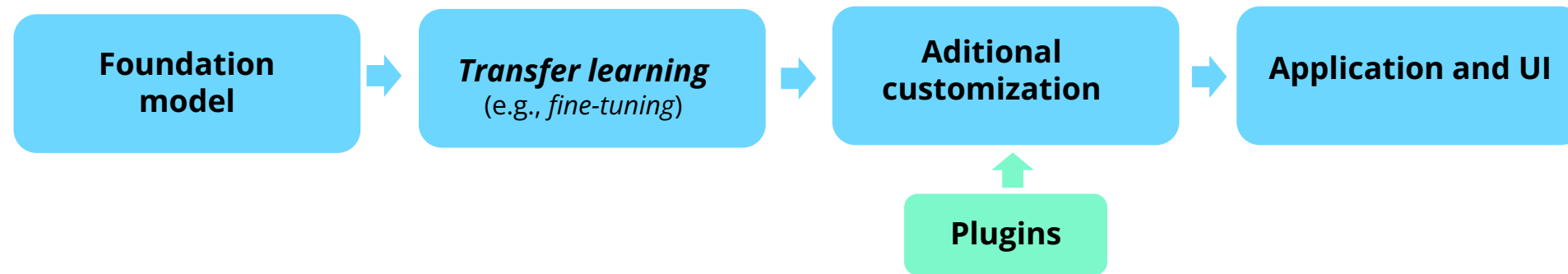
Accelerating scientific research (e.g. drug discovery)

Tool in the production of entertainment content

Accelerating the search and retrieval of information in documents

Virtual assistants

Value chain of Generative AI



- **All these steps may be carried out by the same or by different parties.**
- **Access to foundation models may be more or less open** (open source, API).
- **Plugins** are software components that may expand the features of Generative AI.
- They are **akin to “apps for AI”**.

- The development and deployment of Generative AI requires **data, computing power, and know-how.**

Data

Computing power

Know-how

Glossary:

Development: Training models and adapting them to specific tasks

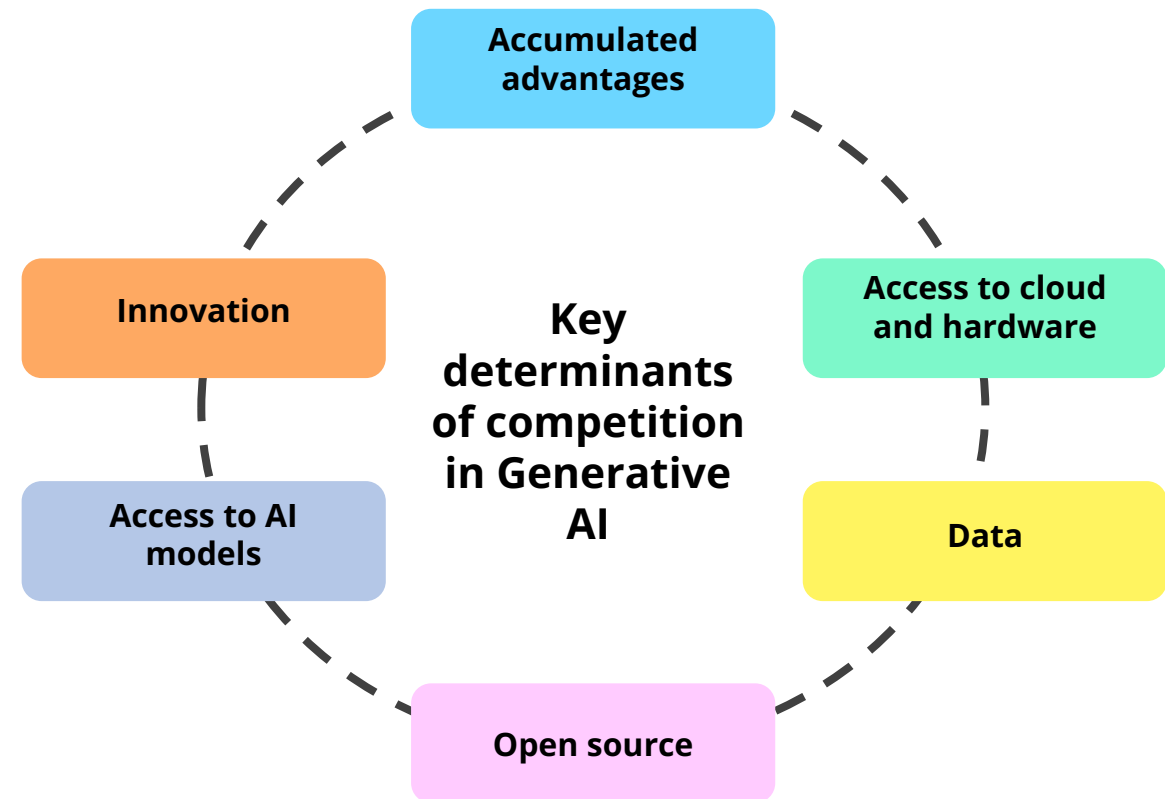
Deployment: Using the models, e.g. making prompts to obtain responses

Potential risks to competition

- **Leveraging risks** in the integration of Generative AI in other products
- **Restrictions in access to Generative AI models**
- **Restrictions in access to data** for the development of Generative AI

05 Key determinants of competition in Generative AI

It is possible to **map** some of the key determinants of competition in the Generative AI sector considering the accumulated experience by national competition authorities in the digital sector and the above-mentioned risks to competition.





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