

Public consultation as part of the decision to start inquiries *ex officio* and issue an opinion on the generative artificial intelligence sector

The *Autorité de la concurrence* (hereafter the “*Autorité*”) is launching a public consultation¹ to gather stakeholder comments on the competitive situation in France in the generative artificial intelligence (hereafter “generative AI”) sector, defined as the creation of new content from a large input dataset² and significant computing power, often using techniques such as deep learning³ and neural networks⁴.

Stakeholders are invited to respond to all or some of the questions posed by the *Autorité* **before 22 March 2024**. These contributions may be in English.

Public consultation

With this document, the Investigation Services are seeking input from all the players in the sector (companies offering generative AI services, cloud service providers, customers, etc.), who are invited to present their business and their place in the value chain and to express their views on current and future competitive issues.

¹ See the *Autorité*'s [press release](#) of 8 February 2024.

² According to the [French data protection authority \(CNIL\)](#), “in artificial intelligence, input data is data used for automatic learning or decision-making by the AI system (in the production phase)”.

³ According to the [CNIL](#), “deep learning is an automatic learning process that uses neural networks with multiple layers of hidden neurons”.

⁴ According to the [CNIL](#), “an artificial neural network is an organised set of interconnected neurons used to solve complex problems”.

Resources needed to develop foundation models

- 1) According to the *Autorité*, the resources needed to train and develop foundation models⁵ include significant computing power, large amounts of high-quality data and a highly-skilled workforce. Do you agree with this statement? Are there any other inputs required to provide generative AI services (infrastructures needed, products and/or services to be mastered, skills to be acquired, authorisations or certifications to be obtained, etc.)?

Computing power

- 2) Can the required computing power be achieved by a company itself with on-premise infrastructure? What would be the advantages and disadvantages of this? Do you have an estimate of the time, financial investment and hardware needed to achieve this?
- 3) What would be the advantages and disadvantages of using a third party, such as a cloud service provider (CSP), to access the computing power needed to train and develop foundation models? Is there a competitive advantage to entering into an agreement or partnership with a CSP?
- 4) Have you identified any proprietary or open-source services (on or off the cloud) that are necessary or essential for training foundation models (e.g. data storage services, vector databases or AI-optimised compute instances)?
- 5) Why are graphics processing units (GPUs⁶ or similar) essential for the development of generative AI? Are they all substitutable? What is the benefit for CSPs of developing graphics processing units in-house?

Data

- 6) Data is also a necessary resource for the development of generative AI tools. Can you specify the type (text, image or other), the different categories of data required (training or other data), the source (public or private) and their relative importance for a foundation model? Does the benefit of these categories vary for a fine-tuned model⁷?
- 7) Does the use of certain data (e.g. health or personal data) entail particular technical and/or regulatory constraints when choosing the infrastructure (e.g. the need to host computing resources on-site or use a trusted cloud offering) and/or during the different phases of model development (data reprocessing, etc.)?
- 8) Do you think certain players have an advantage in terms of data collection, given their position in adjacent markets, for example? If applicable, please distinguish according to the type of data (text, image, etc.) and AI model (foundation or fine-tuned model).

⁵ According to PEReN (the French centre of expertise for digital platform regulation), foundation models are defined as any model, trained on large volumes of data, that can be used for a large number of tasks (from “ChatGPT ou la percée des modèles d’IA conversationnels” [ChatGPT or the breakthrough of conversational AI models], April 2023, page 14).

⁶ Graphics processing units (GPUs) are integrated circuits that perform computing and display functions.

⁷ Fine-tuning is an optional additional process that can be applied to pre-trained models to add specific capabilities or improvements using particular datasets (from Competition and Markets Authority, “AI Foundation Models: Initial Report”, 18 September 2023, page 11).

Technical skills

- 9) Training foundation models also requires strong technical skills, particularly in engineering and data science. Do you think certain players are better placed to attract the skilled workforce needed? Why?

Barriers to entry and expansion

- 10) Do you think access to the above resources is a barrier to entry or expansion to providing generative AI services?
- 11) Do you think the existence of open-source resources (models, data, etc.) is likely to reduce barriers to entry, encourage the emergence of new players and improve the competitive functioning of the sector?
- 12) Do you think the development of leaner foundation models that use less data and more limited computing power is likely to reduce barriers to entry and encourage the emergence of new players?

Competitive landscape and practices likely to be implemented by the different stakeholders in the value chain

- 13) Who are the main players in generative AI in France? Is there anything specific about the French market?
- 14) Are there any competitive problems (e.g. exclusivity clauses between players, denied or difficult access to the resources needed to train and develop foundation models) in the generative AI sector?
- 15) Are there any contractual clauses that limit the ability of highly-qualified people in the generative AI sector to be recruited by competing companies?
- 16) In its opinion on cloud computing⁸, the *Autorité* highlighted problems associated with interoperability between cloud services, which in particular make it more difficult to migrate from one CSP to another. Do you think these problems also apply to foundation models hosted in the cloud?

Minority stakes

- 17) Some of the sector's major players have decided to take minority stakes in a number of innovative companies operating in the generative AI sector. Do you think certain acquisitions can have harmful effects on competition, leading, for example, to increased foreclosure with certain providers?

⁸ Opinion 23-A-08 of 29 June 2023 on competition in the cloud sector.

- 18) The majority of these transactions does not appear to meet merger control thresholds. Do you think the current control procedures implemented by national competition authorities or the European Commission are sufficient? Do you think a revision of these rules at the French or European level would be warranted?

Outlook

- 19) What differentiates generative AI from the other major digital innovations?
- 20) How is the sector likely to evolve over the next five years? Do you think a preferred deployment mode for foundation models (applications, APIs, marketplaces, plug-ins, open-access models, platforms, etc.) will emerge in the future and what impact would this have on how the sector operates competitively?
- 21) What impact will the forthcoming European AI Act have on competition in the sector?
- 22) Do you think the European Digital Market Act (DMA) or the European Data Act will have an impact on the sector's competitive dynamics?
- 23) Do you have any proposals for improving the sector's competitive dynamics, particularly upstream in the value chain?
- 24) Is there anything else you would like to bring to the attention of the *Autorité's* Investigation Services?

Practical information

If you would like to take part in the public consultation launched by the *Autorité de la concurrence*, please send us your responses to the above questions to the dedicated email address consultationvisiagenerative@autoritedelaconcurrence.fr **before 22 March 2024**, specifying the name of the company (or undertaking) on whose behalf you are responding and its sector of activity.

Contributions will not be published. Their authors (names of companies or undertakings) may be cited in the opinion, where appropriate, unless expressly requested otherwise.