

## Public consultation of the French Competition Authority on generative artificial intelligence

### The resources needed to develop foundation models

1) It emerges from the Authority's work that the resources needed to train and develop foundation models are significant computing power, large quantities of high-quality data and highly qualified human resources. Do you agree with this statement? Do you think there are other inputs needed to provide generative AI services (infrastructure required, products and/or services to be mastered, skills to be acquired, authorisations or certifications to be obtained, etc.)?

AFEP member companies share the analysis of the Competition Authority (hereinafter the "Authority") according to which the resources necessary for the training and development of foundation models are a significant calculation power, a large number of high-quality data and highly qualified human resources. Learning algorithms could also be cited.

They nevertheless note that the artificial intelligence sector is a sector that is evolving particularly quickly and that the recent emergence of new efficient models seems to use a smaller volume of each of these resources.

From a financial point of view, AI is a field that requires high and risky investments which therefore require sufficient financial resources.

**Regarding computing power**, AFEP notes that the training and development of certain foundation models, such as "Small Language Models", requires less computing power. Thus, the necessary computing power will vary depending on the nature of the generative AI project to be developed.

Only a few rare companies have the means to completely train a foundation model (OpenAI, Google, Mistral AI, etc.). Most companies use these models by adapting them to their requirements through successive requests – prompting – or precision adjustments – fine-tuning – and without completely retraining the foundation model.

**Regarding data**, AFEP observes that the quality of data is even more important than the volume of data available for the development of AI. Thus, the collection of a large number of data is a relatively easy exercise, particularly given the large volume of public data available, whereas the processing of this data turns out to be a much more delicate exercise in order to have access to reliable quality data.

**Regarding human resources**, AFEP underlines the need for highly qualified personnel. Tensions may exist for certain key resources, particularly regarding cybersecurity and data protection.

As such, there is a gap between the current needs of companies in the labour market and the personnel available and the training offered. This inertia corresponds to a classic issue in a developing market. This gap should be resolved in the medium term, while training adapts to labour market demand.

There is, therefore, a risk of seeing talents – newly trained in AI and having become very employable – leaving a company, due to strong competition and the attractiveness of their skills. Qualified resources are in high demand and are largely captured by non-European players who have very significant resources.

Beyond the question of training and technical skills, there is also a need for knowledge of the different economic sectors, which inherently varies, and can be lacking. Here again, the knowledge and expertise of human resources may therefore vary depending on the nature and economic sector in which the AI project will be developed.

AFEP member companies observe that the development of AI requires varied skills and profiles, not limited to qualified engineers, dedicated project managers, data analysts, but also lawyers, data protection officers or even ethics and compliance managers. These skills are essential for the responsible launch and use of AI models. In a market increasingly concerned with ethical and compliance considerations, these experts can help position an organization as a leader in the responsible development and use of AI.

Finally, AFEP considers that the importance of having highly qualified human resources constitutes an issue not only in terms of the development of AI systems but also in terms of the use of these systems. However, the use of generative AI only requires fairly short training to be able to derive significant benefits.

### ***Computing power***

2) Please indicate whether the necessary computing power can be achieved by the company itself with on-site infrastructure. What would be the advantages and disadvantages of this choice? Do you have an estimate of the deadlines, financial investments, and computer equipment necessary to obtain it?

The choice for a company to have its own infrastructure on-site rather than using a third party, such as a cloud service provider, depends on a comparative study of the advantages and costs in each of the hypotheses.

Thus, favouring an on-site infrastructure in principle allows the company a greater control of the security of its data. Indeed, an on-site infrastructure not only ensures that the company's data is not used by the service provider to improve the latter, but also guarantees that this data is not even accessed.

However, in this hypothesis, the company will not benefit from the same storage capacities nor the same calculation capacities as if it used a third party. Indeed, cloud service providers offer their customers large storage capacities as well as significant computing power, given the difficulties in supplying GPUs.

Furthermore, in this scenario, the company will solely bear the installation and maintenance costs – including qualified personnel – of an on-site infrastructure.

Deadlines and costs will be closely linked to the nature and characteristics of the AI project to be developed.

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 necessary for training and developing foundation models? Is there a competitive advantage to entering into an agreement or partnership with a CSP?

As mentioned above, the choice for a company to have its own infrastructure on-site or to use a third party, such as a cloud service provider, depends on a comparative study of the advantages and costs of each of the hypotheses.



Thus, favouring the use of a cloud service provider in principle allows the company to have greater storage capacity and greater computing power, given the difficulties in supplying GPUs. Additionally, using a service provider offers some flexibility in using these capabilities.

On this point, companies observe that the development of an AI system initially requires particularly significant computing power, sometimes greater at the beginning of the project than that actually necessary, for reasons of security and efficiency, and that this computing power can be adapted and reduced later. Using a third party therefore allows you to have a computing capacity that can be adapted according to your needs and the state of development of your projects.

In addition, using a cloud service provider can provide a certified sovereign infrastructure (ex: SecNumCloud).

Finally, using a third party also allows access to its expertise and advice.

Conversely, the use of a cloud service provider does not allow AFEP member companies to offer the same guarantees of confidentiality of company data as in the case of their own infrastructure. The protection of data confidentiality should, however, guarantee not only the absence of use of the data by the service provider to improve the latter, but also the guarantee of absence of access to this data.

In addition, the costs when using a third party are particularly high. They will vary depending on the nature of the AI project to be developed (complexity, volume of data to be processed, computing power required, etc.) but can amount to millions of euros for AFEP member companies.

4) Do you identify proprietary or freely accessible services (on the cloud or outside), necessary or essential for training foundation models (for example data storage services, vector databases or calculation instances optimized for AI)?

Vector databases are essential for training foundation models as they enable the necessary statistical analysis and similarity calculations.

5) How are graphics processing units (“GPUs” or others) essential to the development of generative AI? Are they all interchangeable? What is the interest of CSPs in developing these graphics processing units internally?

Graphics processing units are essential to the development of generative AI as they offer the greatest computing capabilities. Their cost will vary depending on their computing power. The greater the computing power, the higher their cost will be. They are therefore not all interchangeable. As mentioned above, the development of certain foundation models such as “Small Language Models” requires less computing power.

AFEP member companies note that the company NVIDIA now holds around 85% of the graphics processing unit market. NVIDIA chips are almost essential for developing AI models, even if competing offers are starting to emerge (CEREBRAS, SambaNova).

They further observe that NVIDIA limits the distribution of its products by citing stock availability problems, but that certain companies have privileged supply agreements, including CoreWeave, which offers Cloud services, and have internally as much of GPUs as Meta, allowing it to offer storage services with exceptional computing capacities.

At the same time, NVIDIA would have participated in a fundraising from CoreWeave, and would develop its own software for the use of GPUs.

Given these supply difficulties, Microsoft, Google and Amazon are developing their own chips in order to be able to associate them with their own Cloud services.

However, upstream of the supply of GPUs, the market is also characterized by the limited number of chip foundries and the difficulties in supplying raw materials.

### ***Data***

6) Data is also a necessary resource for the development of generative AI tools. Can you specify their type (text, image, or others), the different categories of data necessary (training data or others), their source (public or private) and their relative importance for a foundation model? Does the relevance of these categories vary for a fine-tuning model?

As mentioned above, AFEP member companies observe that the quality of data is of even greater importance than the volume of data available for the development of AI.

The type of data needed to develop an AI will vary depending on the AI model you want to develop, whether it is generative or not.

Foundation models are generally developed using public data that is available in large quantities. Access to private data makes it possible to refine the development of an AI model. Certain players, having access through their economic model to a large volume of quality data, can therefore develop these models more quickly. Other players absorb data from websites, but this requires significant technical resources, particularly storage space. For most companies, however, it may be more attractive to refine existing models and integrate them into downstream systems or applications than to develop new ones.

7) Does the use of certain data (such as health data or personal data) result in specific technical and/or regulatory constraints when choosing infrastructure (such as the need to host computing resources on-site or to use a trusted cloud offer) and/or during the different phases of model development (data reprocessing, etc.)?

Certain regulations strictly govern the use of banking or health data.

The WHO has published the first global report on artificial intelligence applied to health and proposes that related regulation and governance be based on six guiding principles relating to its design and use: (i) Protecting human autonomy (ii) Promoting human well-being and safety and the public interest (iii) Ensuring transparency, explainability and intelligibility, (iv) Fostering responsibility and accountability, (v) Ensuring inclusiveness and equity, and (vi) Promoting AI that is responsible and sustainable.

In addition, the notion of personal data within the meaning of the GDPR has been interpreted in a particularly broad manner by decision-making practitioners so that a very significant number of data can today be qualified as personal data. The propensity of data protection authorities to view the processing of personal data and, even more so, the sharing of such data as inherently risky, has erected strong barriers to third-party access to personal data.

Thus, the authorities have an extensive interpretation of the obligation for data controllers to carry out an impact analysis before carrying out a data transfer, which limits the circulation of data. The questions of information and consent of people for their data to be used as part of the development of an AI system further complicate access to this data.

Furthermore, the lack of harmonization in the implementation of the GDPR within the EU also has an

impact on European actors.

8) Do you consider that certain players have an advantage in data collection given, for example, their position in adjacent markets? If applicable, distinguish according to data type (text, image, etc.) and AI model type (foundation or fine-tuning model)?

Indeed, large platforms have a clear advantage in data collection, through their economic models, and have significant data storage and calculation capacities. In addition, they can rely on regulations regarding the protection of personal data to refuse to share this data.

This advantage concerns all data regardless of its type – text, image, etc. – and allows these players to have better quality data for fine-tuning their AI models.

### ***Technical skills***

9) Training foundation models also requires strong technical skills, especially in engineering and data science. Do you think that certain players are better able to attract this qualified workforce? For what reasons?

As mentioned above, the development of generative AI models concerns a few companies. Indeed, most companies use these models, possibly adapting them to their own requirements.

The major digital players benefit from numerous strengths to attract the best talents: the reputation of innovative companies, stimulating projects, almost unlimited resources and tools, and particularly attractive remuneration. They therefore offer a general working framework that is particularly attractive for talents.

On all of these points, the smallest players do not have the financial means to compete with the large players, in particular, to ensure the high capital requirements necessary for research and at the start of development.

### ***Barriers to entry and expansion***

10) Do you think that access to the above resources constitutes a barrier to entry or expansion from the perspective of providing generative AI services?

Indeed, access to the aforementioned resources can constitute a barrier to entry into this sector.

**AFEP member companies consider that access to data, and more particularly quality data, constitutes the most significant barrier to entry in this sector.** As mentioned above, access to quality data, generally non-public data, allows the fine-tuning of AI models.

In this context, a **strict interpretation of the GDPR**, disconnected from its initial balanced approach to risk analysis, **may constitute an obstacle to the development of new players in the AI sector in general and generative AI in particular.**

As mentioned above, the notion of personal data within the meaning of the GDPR has been interpreted particularly broadly by decision-making practitioners. The propensity of data protection authorities to view the processing and, even more so, the sharing of data as inherently risky has created strong barriers to third-party access to personal data. This causes considerable legal uncertainty and discourages companies from sharing their data.

In addition, the largest online platforms have implemented various strategies to block or reduce third-party access to their users' data, adding new features or stopping technical support on key technologies, exploiting the potential risk for the protection of users' personal data.

11) Do you consider that the existence of freely accessible resources (models, data, etc.) is likely to reduce entry barriers, encourage the emergence of new players and improve the competitive functioning of the sector?

**AFEP member companies consider that the existence of open access resources is a solution to reduce barriers to entry and promote competition in the generative AI sector.**

For businesses, open-source models offer many opportunities, both in commercial and scientific terms. Access to the codes and weights of models already developed on the market allows companies to improve them and adapt them to their specific needs. Free models, especially pre-trained models, significantly lower barriers to entry because they allow small businesses to innovate at significantly reduced costs.

Thus, the existence of freely accessible resources allows an increase in collective competence in the world of AI.

However, AFEP observes that the notion of open-access resources covers a certain number of very different situations. Indeed, there can be different degrees of opening and several ways of opening a model. Indeed, the underlying code, architecture, training data, weights or learning process can be opened together or separately. The use of open-source models is also governed by licensing conditions, which sometimes exclude commercial use of the model. All the components of an AI model are therefore rarely simultaneously open-source.

In addition, companies observe that the operational implementation of these open-access resources can be cumbersome and dissuasive. On the other hand, the learning bases of open-source models are often heterogeneous, difficult to identify and therefore pose problems of traceability and respect for possible intellectual property rights.

At the same time, AFEP member companies also recognize the virtues of competition on the merits which allows an innovative company that markets paid generative AI models to conquer markets and make profits.

12) Do you consider that the development of simpler foundation models, using less data and more limited computing power, is likely to reduce barriers to entry and encourage the emergence of new players?

As mentioned above, AFEP member companies observe that the artificial intelligence sector is a sector that is evolving particularly quickly and that the recent emergence of new models seems to be based on a lower volume of data as well as computing power.

This is particularly true for specialized generative AI models, for example for a given sector.

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

13) Who are the main players in generative AI in France? Is there anything specific to the French market?

AFEP observes that the generative AI market in France is largely dominated by foreign players, notably Microsoft, Google and Amazon, who offer cloud services essential for the development of AI systems.

However, small French players remain such as Mistral AI, OVH, or Dassault Systèmes. They nevertheless suffer from the obstacles identified in this contribution, particularly from the commercial practices implemented by vertically integrated operators.

14) Are there competitive dysfunctions (such as exclusivity clauses between players, refusal or difficulties in accessing the resources necessary for training and developing foundation models) in the generative AI sector?

Generative AI can be considered a major technological advancement, but it **may encounter competition issues that have already been identified in other sectors involving the same main players**. Indeed, generative AI models share the same characteristics and dynamics as other digital services.

Thus, the main generative AI models on the market today are developed or distributed by the largest online platforms. **Vertically integrated, and dominant in adjacent markets, these players can be encouraged to strategically limit their competitors' access to downstream markets.**

**AFEP already observes the following practices in the generative AI sector:**

- **financial advantages:** cloud computing "hyper scalers" use their superior means to offer cloud credits - free access to cloud services - in an attempt to capture the AI market as part of their services. The amount of cloud credits granted by these "hyper scalers" has recently increased. These cloud credits encourage AI users to choose the services of these "hyper scalers".
- **tying:** companies with activities in markets adjacent to AI, in particular the software market, could use their position in these markets to integrate an AI solution directly into a software suite or offer. These practices encourage software users to use AI solutions developed by the same software provider.
- **technical lock-in:** cloud computing "hyper scalers" offer proprietary solutions to users who wish to create or develop an AI model. However, when the final model is created, users do not have access to the model itself (i.e. its file) but only have the possibility to use it or deploy it from the infrastructure of the same supplier. If migration to another solution remains possible, financial costs and transition are real obstacles. This practice has the effect of locking the user into the cloud provider's services.

**In addition, companies are noticing the existence of self-preferencing practices, or even exclusivity clauses in contracts that link certain developers of AI models with cloud service providers.**

All of these practices create obstacles for new entrants to the market or for players who only offer their services at one stage of the value chain.

At the same time, AFEP member companies observe that they have very little room for maneuver in

negotiating prices and contractual conditions to use the AI models of these “hyper scalers” because they are subject to the same treatment as for other products and services offered by the same “hyper scalers”.

15) Are there contractual clauses limiting the ability of highly qualified people in the generative AI sector to be recruited by competing companies?

To AFEP's knowledge, none exist, but classic non-solicitation and non-competition clauses would fully apply. AFEP observes, however, that such clauses seem to be called into question by competition authorities across the Atlantic, even though they allow small players to resist the force of attraction of “hyper scalers” for their employees.

16) The Authority's opinion on cloud computing highlighted issues related to interoperability between cloud services, making migration from one CSP to another more difficult. Do you think these issues also apply to cloud-hosted foundation models?

AFEP member companies observe that the concerns identified by the Authority in its opinion on cloud computing also apply to foundation models hosted in the cloud. **Vertically integrated, these players may have incentives to strategically limit their competitors' access to downstream markets. This is particularly true for players in the cloud services market.**

Today, only the largest cloud service providers have the capacity to distribute and enable the leading proprietary models in the market. Models based on cloud services provide a quick, out-of-the-box solution for AI developers.

However, as mentioned above, companies are already observing practices of tied selling, self-preferencing, and technical or financial lock-ins in the generative AI sector which create obstacles for new entrants to the market. These practices are all the more damaging for new entrants or non-vertically integrated players as customers are particularly sensitive to consistency and ease of exchange between their different services. Data portability and interoperability of different services are therefore key to ensuring competitive dynamics in these markets.

### Minority stakes

17) Certain major players in the sector have chosen to acquire minority stakes in several innovative companies active in the generative AI sector. Do you consider that certain shareholdings could have harmful effects on competition, leading for example to a strengthening of foreclosure with certain suppliers?

NA

18) The majority of these operations do not appear to meet the merger control thresholds. Do the current control methods by the national competition authorities or the European Commission seem sufficient to you? Do you consider that a revision of these rules at the French or European level would be justified?

AFEP member companies consider that the French and European competition authorities already have a very broad interpretation of their powers to control a merger operation, including below the competence thresholds, whether based on merger control or based on the prohibition of anti-competitive practices.

They also observe that the new interpretation of Article 22 of Regulation No. 139/2004 was based on an initial wish of the competition authorities to control predatory or consolidating operations below the thresholds in certain sectors, particularly in the digital sector.

In this context, a revision of these rules at the French or European level absolutely does not seem justified.

## Perspectives

19) What are the specific features that differentiate generative AI from other major innovations that have taken place in the digital field?

AFEP member companies consider that the emergence of generative AI constitutes a real upheaval, which will have consequences well beyond just the technical and economic fields, but also in the geopolitical field.

They note that generative AI constitutes a global technological revolution, without any adhesion to a particular sector and which will therefore destabilize entire sections of the economy. This technological revolution is certainly comparable to the arrival of the Internet. In addition, this revolution is accessible to as many people as possible with models freely available to the public.

Companies are also observing that AI is characterized by essential dependencies on a small number of actors throughout its value chain, including dependence on GPUs and access to quality databases.

20) What are the likely developments in the sector over the next five years? Do you think that a mode of deployment of foundation models (applications, API, marketplaces, plugins, open model, platforms etc.) will be favoured in the future and what impact would this have on the competitive functioning of the sector?

From a technological point of view, LLMs are deployed in LVM (Large Vision Model) and LAM (Large Action Model) which will facilitate the interaction of generative AI with the physical world, by controlling robots, and software without having use of APIs.

From a competitive point of view, the AI sector risks being characterized by its very strong dependencies identified here on a small number of players throughout the value chain.

21) What impact will the future European regulation on artificial intelligence have on the competitive functioning of the sector?

If the future European regulation on artificial intelligence will have the merit of subjecting all players in the sector to harmonized rules, AFEP member companies do not identify at this stage any positive effect on the competitive functioning of the sector.

This development highlights the importance of integrating legal, ethical, and privacy considerations throughout the AI development and deployment lifecycle. It also presupposes the establishment of specific governance within the company and therefore the allocation of financial resources.

22) Do you think that the European Digital Market Act (DMA) or the European Data Act will have an effect on the competitive dynamics of the sector?

**With regard to the DMA, AFEP member companies observe that although cloud services are**

**integrated into the list of core platform services covered by the Regulation, none of these services have been for the moment designated as a gatekeeper by the European Commission.** However, the generative AI market would greatly benefit from the application of this Regulation to the main cloud service providers in order to boost competition in the market.

Furthermore, generative AI does not constitute an essential platform service within the meaning of the Regulation. The evolving potential of the DMA, in particular its ability to integrate new categories of essential platform services as well as new prohibited practices based on developments observed in digital markets, nevertheless offers hope. The Commission could therefore consider qualifying generative AI models as essential platform services within the framework of this Regulation.

**Regarding the Data Act, AFEP member companies note that this regulation has a much broader scope of application than the future AI Act, or the DMA, and consider that in principle it should facilitate the access of potential new entrants to data** and thus reduce the barrier to entry constituted by access to non-public data. However, this regulation will not actually come into force until September 2025. AFEP observes in this respect that the voluntary standard contractual clauses are still being drafted in the dedicated working group of the European Commission.

Finally, AFEP member companies note that the implementation of all European and French regulatory texts on data in general consumes a significant part of their resources, both legally and engineering wise.

23) Do you have any proposals likely to improve the competitive dynamics of the sector, particularly upstream of the value chain?

NA

24) Would you like to bring any other information to the attention of the Authority's investigation services?

AFEP member companies observe that contracting with “hyper scalers” and other cloud players in a dominant situation can be problematic: the room for manoeuvre in terms of negotiation is very tenuous and these players can impose unbalanced contracts which could be qualified as adhesions contracts. Certain practices such as “bundling” or tied sales are common and customers can thus acquire products or services for which they have no initial need. Publishers thus “push” new products justifying price increases and creating additional dependence among customers.

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## ABOUT AFEP

Since 1982, AFEP brings together large companies operating in France. The Association, based in Paris and Brussels, aims to foster a business-friendly environment and to present the company members' vision to French public authorities, European institutions and international organisations. Restoring business competitiveness to achieve growth and sustainable employment in Europe and tackle the challenges of globalisation is AFEP's core priority. AFEP has 117 members. More than 8 million people are employed by AFEP member companies and their annual combined turnover amounts to €2,600 billion. AFEP is involved in drafting cross-sectoral legislation, at French and European level, in the following areas: economy, taxation, company law and corporate governance, corporate finance and financial markets, competition, intellectual property, digital and consumer affairs, labour law and social protection, environment and energy, corporate social responsibility and trade.

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