

# Generative AI and Competition (Discussion Paper)



公正取引委員会  
Japan Fair Trade Commission



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## [Glossary]

### Graphics Processing Unit (GPU)

A type of semiconductor chip specialized for screen display and image processing. GPUs are known to be suitable for the development of generative AI due to its superior parallel processing capability that can process large amounts of data simultaneously.

### Foundation Model (FM)

The core technology behind generative AI and the foundation for creating individual models. FMs are created through pre-training using large amounts of data. Fine-tuning of the foundation model allows it to be optimized for a specific task or field.

### Large Language Model (LLM)

A type of language-specific generative AI model. LLMs are pre-trained using a vast amount of text data and can generate text for conversations, writing papers, etc. similar to humans.

### Pre-training

The process of initial learning through large amounts of data that takes place when developing foundation models. Pre-training on text data, for example, may involve billions of tokens (words and phrases). This process allows the model to acquire extensive knowledge and lays the foundation for its application to a wide variety of tasks.

### Fine-tuning

Additional training performed on a pre-trained model to optimize it for a specific task or field. The process further improves the performance of the model by specializing it to a specific business domain or application.

### Open-source/Closed-source

Open-source means that the technical specifications are made available to the public so that anyone can freely improve and optimize them. In contrast, closed-source refers to when the technical specifications are not made public and can only be accessed by specific parties.

## 1. Introduction

Generative Artificial Intelligence (AI) technology is advancing rapidly. Models capable of generating various types of content, including text, program code, audio, music, images, and videos, are being developed at an impressive pace, with their accuracy improving significantly. Since OpenAI released ChatGPT in 2022, generative AI has become a global phenomenon.

Various services utilizing generative AI technology are beginning to integrate into business activities and everyday life in Japan as well. The market size in Japan is currently 118.8 billion yen (as of 2023), indicating that the generative AI sector is still in its early stages. However, it is expected to expand rapidly, with an average annual growth rate of 47.2%, reaching 1,777.4 billion yen by 2030<sup>[1]</sup>.

Generative AI offers numerous benefits to the economy and society, such as enhancing business productivity and providing a range of services. It also has the potential to drive transformations in existing businesses and foster the creation of new business models, indicating its capacity to spur new innovations and further development.

However, the rise of generative AI brings with it new challenges and risks. These include concerns about copyright infringement and the potential for social instability and confusion caused by false information and misinformation. There are also potential risks from a competition policy perspective – if access to essential computing resources for developing generative AI is restricted, for example, it could suppress new entrants and potentially stall further development of generative AI and all it has to offer. In Japan, the AI Guidelines for Business (Version 1.0) issued in April 2024 by the Ministry of Economy, Trade and Industry (METI) and the Ministry of Internal Affairs and Communications (MIC) include ensuring fair competition as a key stakeholder expectation, showing the necessity of a fair market for its growth<sup>[2]</sup>. Multiple competition authorities around the globe are closely monitoring the competitive landscape of the generative AI sector through market studies and other means<sup>[3]</sup>.

To foster further innovation in Japan's generative AI market and witness the proper integration of these technologies into our economy and society, it is crucial to maintain a fair and competitive environment. Ensuring the sustainable development of generative AI requires first understanding the current landscape, including both domestic and international trends, and clarification of potential issues related to the Antimonopoly Act and competition policy.

Based on the JFTC's discussions with academic experts, businesses, and overseas authorities combined with desk research, this discussion paper provides an overview of generative AI and

<sup>1</sup> Japan Electronics and Information Technology Industries Association. (2023) Trend Survey on Focus Area (p.1)

<sup>2</sup> "...each AI business actor is expected to contribute to activities that ensure fair competition and facilitate innovation that can create new businesses and services, maintain sustainable economic growth, and provide solutions for social challenges." *AI Guidelines for Business Ver 1.0 Compiled*, p13.  
[https://www.meti.go.jp/english/press/2024/0419\\_002.html](https://www.meti.go.jp/english/press/2024/0419_002.html)

<sup>3</sup> See [Appendix](#) for specific details.

its market structure. It also outlines key discussion points to contribute to the maintenance and promotion of fair and free competition in Japan's generative AI sector. As mentioned above, there are significant issues related to generative AI beyond competition policy. However, since these are being examined separately by other relevant government agencies, this discussion paper focuses exclusively on competition policy issues.

Given the rapidly evolving and expanding generative AI sector, the JFTC has decided to publish this discussion paper to address potential issues and solicit information and opinions from a broad audience. The topics outlined in this paper aim to contribute to future discussions without presenting any predetermined conclusions or indicating that specific problems currently exist. The JFTC seeks insights from various stakeholders, including businesses involved in different layers of generative AI markets (infrastructure, model, and application layers as described in Section 2), industry organizations, and individuals with knowledge in the generative AI field.

Moving forward, the JFTC will analyze the information and opinions gathered from this discussion paper, while simultaneously conducting hearings with relevant domestic government agencies, international authorities, domestic and international businesses, and various experts as part of our market study on generative AI. Given the rapidly evolving nature of the sector where there are new developments daily, the JFTC will punctually sort relevant information from various stakeholders and proceed with the market study in an agile, prompt, and flexible manner, presenting its views on generative AI issues from the Antimonopoly Act and competition policy perspectives as necessary.

## 2. Structure of Generative AI Markets

Artificial intelligence<sup>4</sup> that can create various types of content, such as text and images, in response to prompts (questions and directions), referred to as generative AI, is developed using a model that has been fine-tuned for specific tasks or fields on top of a foundation model pre-trained with large amounts of data. Applications and services capable of generating text, images, audio, and other content using this model (hereinafter referred to as “generative AI products”) are being newly deployed.

Generative AI includes interactive “text generation,” which can produce natural sentences and respond to user inputs of voice or text, and “image generation,” which creates images and illustrations based on user-provided prompts. These technologies have been rapidly evolving in recent years.

The market structure for generative AI is layered, similar to other digital sectors, with both

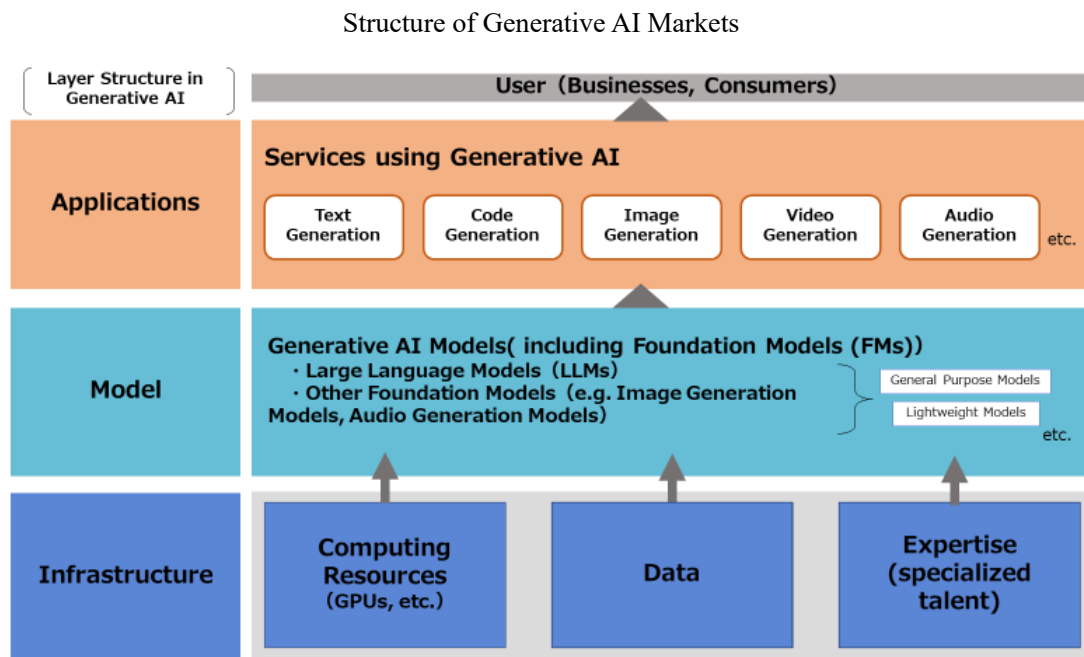
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<sup>4</sup> Although there is no universal definition of AI, the “*WHITE PAPER Information and Communications in Japan 2019*” (the Ministry of Internal Affairs and Communications) states that AI is understood as a broad concept that includes “programs that operate in a manner similar to human thought processes, or information processing and technology that humans perceive as intelligent”.

domestic and international businesses operating within the segments. The development of generative AI models<sup>5</sup>, including foundation models, plays a crucial role within this structure.

These markets are in the middle of forming. Technological innovations that affect the sector's structure, new market entries, and the formation of partnerships bring about almost daily changes.

In this discussion paper, the JFTC examines the current market structure of the generative AI sector by organizing it into three layers, as illustrated in the diagram below.



Prepared by the Japan Fair Trade Commission

## 1 Infrastructure Layer

The infrastructure layer represents a market that acts as the foundation for generative AI. The three main elements of this layer are computing resources (such as GPUs), data, and expertise (specialized talent).

### (1) Computing Resources (such as GPUs)

Computational resources are essential for the development and utilization of generative AI models, with semiconductor chips like GPUs playing a particularly crucial role<sup>6</sup>. This explanation will therefore focus on semiconductor chips. Experts have highlighted that the

<sup>5</sup> “Generative AI model” is a generic term for models used for generative AI products, and includes foundation models and fine-tuned foundation models.

<sup>6</sup> While cloud services are integral to the infrastructure layer, they are covered in Section 4 (1) because they are utilized across various layers, including application development.

performance of generative AI models is strongly correlated with the number of parameters<sup>7</sup> and the computational effort required. Furthermore, achieving significant versatility requires a certain model size. To develop high-performance generative AI models, it is crucial to invest in a sufficient quantity of semiconductor chips tailored for this purpose. Companies such as NVIDIA and Google are prominent developers of these specialized semiconductor chips.

There are various types of semiconductor chips, with GPUs being particularly suitable for developing generative AI models. Originally designed for image processing, GPUs have high parallel processing capabilities, significantly reducing the training time for the development of these models. Specifically, the pre-training phase for developing foundation models is heavily influenced by the number and performance of GPUs utilized. Consequently, some businesses consider GPUs essential for developing foundation models<sup>8</sup>.

Nvidia holds approximately 80% of the global GPU market share<sup>9</sup>. This dominance is attributed to several factors: the high performance of Nvidia GPUs (fast computation), a developer-friendly environment that facilitates parallel computation, and the availability of supporting software. Nvidia continues to enhance these technologies by investing substantial resources into their development.

However, the global supply of GPUs falls short of demand, leading to intense competition among companies, including Big Tech firms, to acquire them. In response, many companies worldwide are developing alternative semiconductor chips. Despite these efforts, the gap between Nvidia and other companies remains significant, with some experts suggesting it is extremely challenging to bridge this gap.

The situation in Japan mirrors the global landscape, and domestic companies are striving to innovate in terms of power efficiency and pricing as they develop their own semiconductor chips.

#### [Questions]

1. Is there any additional information or clarification needed regarding the explanation above (section 2-1 (1))?
2. Are there any obstacles that businesses face when developing or acquiring semiconductor chips for generative AI? If so, what are they?
3. What challenges exist in maintaining and promoting fair and open competition in the

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<sup>7</sup> Generative AI models are composed of numerous variables, known as parameters, which are essential for processing input data in foundational models. Generally, a higher number of parameters correlates with improved performance of the generative AI model. However, this also brings challenges such as longer training times, higher costs, and increased computational demands during inference.

<sup>8</sup> Although other semiconductor chips for generative AI exist in addition to GPUs, demand for GPUs currently remains high.

<sup>9</sup> Bruegel. (2023, June 18). Competition in Generative Artificial Intelligence Foundation Models (p. 7).



semiconductor chip market?

**(2) Data****① Training Data**

In developing generative AI models, it is essential to pre-train the model using training data to understand the structure and meaning of language. This is followed by fine-tuning with additional data to tailor the model to specific tasks, industries, or applications.

The development of generative AI models requires a substantial amount of training data. This has led to issues, particularly in foreign countries, between data holders and AI model developers regarding data usage. For instance, lawsuits have been filed against foundation model developers for copyright infringement related to using publicly available information on the Internet for pre-training. Even when copyright issues are not present, there are often restrictions on acquiring and storing publicly available data, such as the requirement for crawling<sup>[10]</sup> permissions specified in website terms of use.

Consequently, generative AI model developers currently rely on their own data or purchase datasets for training. It has been noted that domestic enterprises, in particular, are cautious about acquiring training data to avoid potential copyright and other legal issues.

**② Japanese Language Data**

Among generative AI products utilizing large language models, which are particularly significant, Japanese data is crucial for those used in Japan. However, as previously mentioned in ① above, a large amount of task-specific data is required. It has been noted that the number of Japanese users is smaller compared to English users, resulting in less Japanese data available on the Internet. Consequently, the amount of data available for training in Japanese is relatively limited.

In this context, domestic businesses have the potential to develop superior language models specialized for Japanese, compared to those developed by Big Tech companies and leading startups. For instance, several domestic companies have created generative AI models that achieve world-class performance in Japanese language benchmarks, measuring Japanese knowledge and document reading comprehension<sup>[11]</sup>.

<sup>10</sup> A program that systematically browses the web to retrieve and store information from websites.

<sup>11</sup> For example, CyberAgent, Nippon Telegraph and Telephone Corporation (NTT), and SB Intuitions.

**[Questions]**

1. Is there any additional information or clarification needed regarding the explanation above (section 2-1 (2))?
2. Are there any obstacles that businesses face when obtaining training data? If so, what are they?
3. What kinds of data will become important in developing generative AI models in the future? And why?
4. Do you believe that critical training data will become concentrated within specific businesses in the future? If so, what impact do you think this will have on competition in the development of generative AI models and related fields?

**(3) Expertise (specialized talent)**

The development of generative AI models requires highly skilled researchers and engineers. This necessity extends not only to the creation of generative AI models but also to the development of generative AI products. However, it has been noted that there is a limited pool of highly specialized professionals capable of developing GPUs and generative AI models. Consequently, hiring these experts is challenging, and their scarcity is becoming a bottleneck in the development of generative AI models.

In this context, some have pointed out that domestic businesses face significant difficulties in hiring these limited specialized professionals. This is primarily because Big Tech companies, with their abundant financial resources, are more capable of attracting and retaining such talent, leading to a concentration of these resources within large tech firms.

**[Questions]**

1. Is there any additional information or clarification needed regarding the explanation above (section 2-1 (3))?
2. Are there any obstacles that businesses face when hiring highly specialized professionals? If so, what are they?
3. What kinds of talent will become important for developing AI semiconductor chips, generative AI models, and generative AI products in the future? And why?
4. Do you think highly skilled talent will become concentrated within specific companies in the future? If so, what impact do you think this will have on competition in the development of AI semiconductor chips, generative AI models, and generative AI products?

## **2 Model Layer**

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The model layer represents a market focused on developing generative AI models, which are

pre-trained using vast amounts of data, often leveraging cloud technologies. Prominent providers of these models include foreign companies like OpenAI, Anthropic, Google, and Meta, as well as domestic firms such as CyberAgent, Nippon Telegraph and Telephone Corporation (NTT), and SB Intuitions.

Generative AI models can be categorized into three main types: ① text generation, ② image (including video and 3D model) generation, and ③ audio generation. Currently, text generation dominates the generative AI market.

These models can be divided into general-purpose models, which are versatile across various tasks, and specialized models tailored for specific industries or applications, such as finance and medicine. Domestic companies have developed large language models that are both lightweight and highly precise, as described below.

### **(1) Large Language Models**

Large language models, a subset of generative AI models, are designed specifically for generating and processing text. They are trained on extensive text datasets. An example is the generative AI model used in ChatGPT by OpenAI, which significantly contributed to the rise of generative AI.

Currently, Big Tech companies and leading startups frequently release upgraded large language models, indicating a highly competitive development landscape among major players.

In Japan, several companies are actively developing and offering large language models with advanced language capabilities for Japanese. Additionally, there is ongoing research and development aimed at enhancing the power efficiency of training these models.

Indeed, while general-purpose large language models provided by international companies lead in pure performance aspects such as inference<sup>12</sup> capabilities, multilingual competence, and handling inputs including images and videos, domestic companies are also making significant strides. By leveraging open-source foundational models and pre-training with high-quality Japanese language data, they are developing generative AI models that excel in Japanese language performance and cater to unique Japanese business needs. Additionally, domestic providers differentiate themselves by offering ease of customization to meet specific customer needs and by building their own computational resources and hardware, such as servers, to ensure a more secure operational environment. However, it is worth noting that some foreign companies are also continuously training their models with Japanese language data, resulting in highly performant Japanese language models, which fuels a competitive development landscape.

There is a trend among Japanese large language model developers to focus on specialized

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<sup>12</sup> The process by which a generative AI model runs live data to make a prediction or solve a task.

models tailored for specific industries or applications, rather than competing directly with the general-purpose models developed by Big Tech companies and leading startups. Furthermore, efforts are being made to develop lightweight large language models to reduce the required computational resources and energy consumption.

## (2) Other Generative AI Models

In addition to the aforementioned points in (1), there is ongoing development of generative AI models capable of creating images (including videos and 3D models) and audio. For instance, these models can generate images similar to those they have been trained on, based on prompts (such as questions or task instructions).

The technologies for image and audio generation have evolved from existing image and audio recognition technologies, and their use is expanding, particularly among creators and artists. This suggests significant potential for further advancements in the future.

Currently, it is possible to use inputs such as audio and images, and there is progress in technologies that integrate and process different types of data (text, images, audio) in a unified manner, known as multimodal processing.

Given the promising outlook for these fields, both domestic and international companies, including startups, are actively engaged in technological development.

### [Questions]

1. Is there any additional information or clarification needed regarding the explanation above (section 2-2)?
2. Are there any obstacles that businesses face when developing generative AI models? If so, what are they?
3. How do you foresee the competition for developing generative AI models evolving in the future? Will it favor lightweight models, larger models, specialized models for specific industries or applications, or general-purpose models? Why?
4. What challenges exist in maintaining and promoting fair and free competition in the development of generative AI models?

## 3 Application Layer

The application layer represents a market where generative AI products are developed and offered. These products, which include text generation, code generation, image generation, video generation, and audio/music generation, are created in response to input prompts (such as questions and instructions). Many businesses, including startups, enter this market to develop these products, which are then provided to businesses and general consumers either for a fee or

free of charge.

As detailed later, Big Tech companies and leading startups offer platforms that enable the use of generative AI models. Generative AI product developers can choose and utilize the models that best suit their needs through these platforms. Each platform has unique characteristics, such as the types of generative AI models they support and whether they offer development support services for generative AI products.

#### **(1) Inner Workings of The Application Layer**

Generative AI products are developed using the generative AI models mentioned in 2 (*Model Layer*), and the choice of model significantly impacts the product's performance and characteristics. The models used by generative AI product developers can be categorized into three types: ① those provided as open source, ② those provided as closed source, and ③ those developed internally by the business.

It is possible to use ① by leveraging models published on a generative AI model platform. The conditions for use vary depending on the license, but some models can be used free of charge. Regarding ②, access is granted by paying a fee and connecting to the API.<sup>13</sup> This connection can be made either through the platform of the generative AI models or directly with the provider. Generally, the platform provider offers these models after signing a license agreement with the model provider and charges fees to generative AI product developers based on usage metrics such as the number of API requests or usage time, according to the fee structure defined for each model.

#### **(2) Current Application Layer Conditions**

Generative AI products are widely being used in industries such as finance, construction, healthcare, and law. The development of these products often relies on cloud services provided by large-scale digital platform operators. Big Tech companies and their affiliates may ① develop and offer generative AI products using these cloud services or ② integrate generative AI functions into their existing products.

In addition to Big Tech, many other businesses are developing and providing generative AI products using these models. There have been instances where businesses have requested the integration of generative AI functions into their internal systems, leading to the introduction of such services.

While major generative AI models are primarily developed and provided by foreign

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<sup>13</sup> An API (Application Programming Interface) is an interface that allows different applications and software to communicate with each other. It defines the format and protocols for how functions and features of a program can be accessed and used externally. APIs are primarily used to link and share data between different applications and software systems.

companies, domestic firms are also active in this space, creating and offering their own generative AI products using their own generative AI models.

### **(3) Integration with Existing Digital Services**

In the application layer, there is a trend towards integrating generative AI functionalities with existing digital services, such as search engines, office productivity software, cloud services, social networks, and digital advertising tools. Big Tech companies have solidified their positions in various markets through these digital services. By incorporating generative AI capabilities, they can enhance the competitiveness of their existing services and further strengthen their market positions.

Additionally, there is a perspective that generative AI models themselves do not establish a two-sided market<sup>14</sup>. Generative AI product developers often integrate AI functionalities into existing services via APIs, resulting in a weaker indirect network effect compared to digital platforms. However, the generative AI platforms mentioned earlier can be seen as forming a two-sided market, connecting users such as generative AI product developers with the AI model developers. Moreover, agent-type products—generative AI products that can interact with external applications (e.g., chat applications and schedule management tools)—offer increasing benefits to users as the number of compatible external applications grows. This increase in user base enhances the value for external application developers, leading to more integrations and potentially creating an indirect network effect.

#### **[Questions]**

1. Is there any additional information or clarification needed regarding the explanation above (section 2-3)?
2. Are there any obstacles that businesses face when developing generative AI products? If so, what are they?
3. How do you foresee the domestic market for generative AI products evolving in the future?
4. What challenges exist in maintaining and promoting fair and free competition in the generative AI products market?

## **4 Other Generative AI Specific Issues and Considerations That Transcend Layers**

### **(1) Cloud Services**

Among developers of generative AI models and products, only a few, such as Big Tech companies and leading startups, possess their own computing resources. Most developers lack these resources and therefore rely on specialized cloud services from cloud service providers.

<sup>14</sup> A market in which multiple layers of companies and consumers exist under a platform

As previously mentioned, developers without their own computing resources often need to work with Big Tech companies, which dominate the cloud services market essential for developing generative AI models and products<sup>15</sup>.

The use of cloud services in developing generative AI models and products is expanding, and the proliferation of AI-related cloud services is driving the growth of the cloud service market. It is anticipated that competition in this market will remain intense, primarily among Big Tech companies.

Additionally, several domestic operators are involved in providing cloud services for developers of generative AI models and products.

## **(2) Switching/Migrating Development Environments**

It has been noted that switching a development environment built with specific semiconductor chips and dedicated software to another environment can incur significant costs, such as system reconstruction. This may cause developers to hesitate to switch. Furthermore, as mentioned in (1), when using cloud services for the development and deployment of generative AI models and products, it can be challenging to switch to other cloud services or migrate to an on-premise<sup>16</sup> environment.

Furthermore, it has been noted that when users, such as generative AI product developers, customize generative AI models, they face higher switching costs to transfer trained components. This tendency for switching costs to arise at each layer makes the entire generative AI market structurally prone to lock-in.

## **(3) Open-source/Closed-source**

As described in 3 (1) above, there are two types of generative AI models: open-source and closed-source. Open-source models help create a competitive environment by lowering entry barriers for developing and using generative AI products, particularly benefiting new entrants and startups that typically struggle with high costs. Open-source models allow anyone to review and improve technical specifications, facilitating security verification and accelerating technological advancement. However, the disclosure of technical specifications makes it challenging for businesses to maintain a competitive edge and poses a risk of misuse due to the ease of access.

Conversely, closed-source models keep technical specifications undisclosed, allowing companies and research institutions to control and limit the use of generative AI, thereby

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<sup>15</sup> JFTC. (2022, June) the Report Regarding Cloud Services” (pp.29-30). AWS, Microsoft, and Google account for just over 60% of the domestic cloud services market share.

<sup>16</sup> When the company owns and operates its own infrastructure (servers, network equipment, software, etc.) necessary to operate its IT systems.

reducing the risk of third-party abuse. This approach has its drawbacks, however, including difficulty in accepting external feedback and contributions, which may hinder innovation, and a lack of transparency due to the undisclosed technical specifications.

Given the above considerations, it remains unclear whether open-source or closed-source approaches are preferable from a competition policy perspective. However, it is crucial to ensure a variety of options in the development and provision of generative AI models and products.

#### (4) Partnerships

Partnerships are actively forming both in Japan and abroad across market layers in the generative AI sector. These collaborations span various layers, including those between semiconductor chip providers and generative AI model developers, among generative AI model developers themselves, and between generative AI model developers and product developers. Several examples highlight partnerships between Big Tech companies that offer existing digital services and startups focused on developing generative AI models<sup>[17]</sup>.

For startups developing generative AI models, these partnerships offer significant benefits such as securing large investments for development, gaining access to necessary resources, and leveraging existing related technologies. On the other hand, Big Tech companies benefit by licensing innovative generative AI models from startups, which can enhance the competitiveness of their existing digital services.

However, it has been pointed out that such partnerships could potentially allow Big Tech companies and leading startups, which have already established a strong position in existing digital markets, to further strengthen their positions generative AI markets, and weaken competition in the generative AI sector<sup>[18]</sup>.

#### [Questions]

1. Is there any additional information or clarification needed regarding the explanation above?
2. Are there any obstacles that businesses face when using cloud services to develop generative AI models and products? What challenges exist in maintaining and promoting fair and free trade?
3. Do developers of generative AI models or products face difficulties when migrating or

<sup>17</sup> Examples include the Nvidia and Mistral AI partnership, the Microsoft and OpenAI partnership, and the Amazon and Anthropic partnership.

<sup>18</sup> In the United States, the Federal Trade Commission (FTC) requested information on investments and business alliances between developers in the generative AI sector and cloud service providers in January 25, 2024. Meanwhile, competition authorities in Europe, the U.K., and other regions are also investigating these partnerships.



- switching development environments? If so, what are these difficulties? If not, why?
4. How should the use of open-source versus closed-source models be considered in terms of maintaining and fostering fair and free competition in the generative AI model and product markets?
5. How should partnerships between developers in the generative AI market be viewed from the perspective of maintaining and fostering fair and free competition?

### 3. Antimonopoly Act and Competition Policy Issues in Generative AI

The following summarizes issues related to the Antimonopoly Act and competition policy in light of the current standing of generative AI markets described in Section 2 (items 1 to 4).

#### 1 Access Restrictions and Exclusion of Competitors

As mentioned in Section 2-1, developing generative AI models requires significant infrastructure, including computing resources (such as GPUs), data, and expert talent. For instance, Nvidia holds approximately 80% of the GPU market share, and several major companies dominate the cloud service market. Consequently, these companies are considered to have a strong position in the generative AI sector. Additionally, as noted in Section 2-4 (2), there are areas where switching costs are likely to increase, such as when data migration is challenging. If businesses lack such infrastructure internally and face restricted access, finding an alternative infrastructure supplier becomes difficult.

In such circumstances, for example, ① if a company with a dominant position in the semiconductor chip market imposes restrictions on transactions with a generative AI model provider—such as by requiring the provider not to purchase semiconductor chips from other suppliers or by imposing other limitations—competition in the semiconductor chip market could be impacted. Additionally, ② if a company collects a large amount of data through digital services other than generative AI models and has broad access to this data, it may already have a strong competitive advantage. If this company restricts access to such data, it could impact competition by reducing opportunities for new entrants.

#### [Questions]

1. What are your thoughts on the explanation above (section 3-1)?
2. Are there any real-world examples similar to those described? If so, please provide specifics with as much detail as possible.

#### 2 Self-Preferencing

As mentioned in Section 2-3, with the increasing use of AI products, one can assume that

more decisions will be based on the inference results of AI models. In this context, ① if a dominant player in the AI model market develops an AI model that favors its own products and services over those of competitors in inference results, it could potentially impact competition for those products and services.

Additionally, also as noted in Section 2-3, competition in the generative AI model market is being promoted through the emergence of platforms that allow developers to choose from various generative AI models based on their applications. For example, ② if a leading provider of a generative AI models platform promotes its own generative AI model on its platform, for example by giving it a more prominent display position, it could impact competition.

**[Questions]**

1. What are your thoughts on the explanation above (section 3-2)?
2. Are there any real-world examples similar to those described? If so, please provide specifics with as much detail as possible.

### 3 Tying

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As described in 1 (*Access Restrictions and Exclusion of Competitors*) above, in the generative AI sector, when a business primarily engaged in existing digital services has established a strong position, it can influence the market. For instance, if a company with a dominant position in the cloud service market requires the use of its own generative AI model as a condition for providing cloud services, it could affect the business activities of other companies or new entrants in the generative AI market, thereby impacting competition for generative AI models.

**[Questions]**

1. What are your thoughts on the explanation above (section 3-3)?
2. Are there any real-world examples similar to those described? If so, please provide specifics with as much detail as possible.

### 4 Parallel Conduct Using Generative AI

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The concept of parallel practices using algorithms is detailed in “Algorithms/AI and Competition Policy” (published by the Study Group on Competition Policy in the Digital Markets on March 31, 2021). Regarding parallel practices using generative AI, while price competition can be stimulated through price research and pricing by generative AI, it can also lead to cooperative pricing depending on how it is used.

For instance, multiple generative AI developers might set prices in a synchronized manner if they use the same generative AI model from a single provider. Similarly, users of a generative AI

product might employ applications or tools that utilize the same generative AI model. Consequently, their underlying data and algorithms could align, leading to similar pricing strategies, production targets, and other business activities, which could impact competition.

**[Questions]**

1. What are your thoughts on the explanation above (section 3-4)?
2. Are there any real-world examples similar to those described? If so, please provide specifics with as much detail as possible.

## **5 Acquiring Specialized Talent Via Partnerships**

As described in Section 2-1 (3) above, developing generative AI requires highly specialized talent. Innovation driven by these experts adds significant value to generative AI products. Therefore, securing such talent is crucial for competing in the development of generative AI models and products. This competition for expert human resources, in turn, fuels the overall race to develop advanced generative AI technologies.

On the other hand, if a company aims to corner highly skilled talent by hiring high ranking experts from a competitor or employees from a leading startup who have accumulated valuable research know-how, and form a partnership to retain these highly specialized human resources – resulting in effects similar to that of an acceptance of assignment of business – it could impact competition.

**[Questions]**

1. What are your thoughts on the explanation above (section 3-5)?
2. Are there any real-world examples similar to those described? If so, please provide specifics with as much detail as possible.

## **4. Conclusion (The Japan Fair Trade Commission's next steps)**

The JFTC will employ an agile survey method to conduct its market study on generative AI swiftly and flexibly, considering the dynamic nature of the generative AI sector. The Commission will continue to hold hearings, and based on the feedback and information gathered from this discussion paper, will assess the current state of the generative AI markets, publishing subsequent reports as necessary.

As noted in the introduction, generative AI markets are rapidly evolving with daily technological advancements that could significantly alter the sector's structure. It is crucial to accurately monitor and understand trends and issues. To foster the development of generative AI markets under fair and free competition, the JFTC encourages the submission of opinions and

information from a diverse range of stakeholders in response to this discussion paper.

**[Questions]**

1. Are there any topics not covered in this discussion paper that the JFTC should consider regarding the current state of the generative AI market (including infrastructure, generative AI models, and generative AI products)?
2. Are there any additional issues related to the Antimonopoly Act and competition policy for generative AI that should be considered beyond those discussed in this paper?
3. If you have any other information or comments regarding generative AI, please share them with the JFTC.

End

## [Appendix] Foreign Competition Authorities' Work in The Generative AI Space

### 1 European Union

On January 9, 2024, the European Commission invited public comments on competition in the field of virtual worlds and generative AI (deadline: March 11, 2024) to identify potential competition issues that may arise in the technology sector and to conduct forward-looking analysis of technology and market trends<sup>[19]</sup>. The public comments were organized into 12 questions to identify potential competition issues that may arise in these technology sectors.

In addition, the European Commission has announced that it is currently conducting a review on the arrangements between the major players in the digital market and the developers and providers of generative AI<sup>[20]</sup>.

### 2 United Kingdom

The Competition and Markets Authority (CMA) conducted a study of AI foundation models from the perspective of competition and consumer protection policies. It published a survey report on generative AI foundation models on September 18, 2023<sup>[21]</sup>, and an updated version of the report was published on April 13 of the following year<sup>[22]</sup>, which indicated concerns in terms of fairness, efficiency, and openness of competition.

The CMA is also seeking input on whether certain Big Tech and startup partnerships are subject to UK merger regulations, and the impact of these partnerships on competition in the UK<sup>[23]</sup>.

### 3 United States

In January 2024, the Federal Trade Commission (FTC) issued an order to five companies - Alphabet, Amazon, Anthropic, Microsoft, and OpenAI - to provide information on recent investments and partnerships involving generative AI companies and major cloud service providers under Section 6 of the FTC Act. The order was issued to companies involved in three business partnerships (Microsoft-OpenAI, Amazon-Anthropic, and Google-Anthropic) including billions of US dollars of investments, to better understand how partnerships and investments formed between AI developers and cloud service providers impact competition.

Additionally, FTC technologists have been discussing competition issues related to technology on their blog. On June 29, 2023, a blog post titled "Generative AI Raises Competition Concerns"

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<sup>19</sup> [Competition in virtual worlds and generative AI \(europa.eu\)](https://europa.eu/competition/antitrust/competition_in_virtual_worlds_and_generative_ai)

<sup>20</sup> In a speech on June 28, 2024, Commissioner Vestager stated that the investigation would be dropped due to lack of evidence, but that the Commission would continue to monitor relationships among major players in this area. [Competition in AI: wising up in a new world \(europa.eu\)](https://europa.eu/competition/antitrust/competition_in_ai_wising_up_in_a_new_world)

<sup>21</sup> [AI Foundation Models: Initial report - GOV.UK \(www.gov.uk\)](https://gov.uk/government/uploads/system/uploads/attachment_data/file/118888/AI_Foundation_Models_Initial_report.pdf)

<sup>22</sup> [AI Foundation Models: Update paper - GOV.UK \(www.gov.uk\)](https://gov.uk/government/uploads/system/uploads/attachment_data/file/124888/AI_Foundation_Models_Update_paper.pdf)

<sup>23</sup> [Microsoft / OpenAI partnership merger inquiry - GOV.UK \(www.gov.uk\)](https://gov.uk/government/uploads/system/uploads/attachment_data/file/124888/Microsoft_OpenAI_partnership_merger_inquiry.pdf)

explained that competition could be harmed if a critical component of generative AI delivery is controlled by a single operator<sup>24</sup>. The blog also shared key insights from the panels at the AI Tech Summit<sup>25</sup> held by the FTC on January 25, 2024<sup>26</sup>.

#### 4 European Union, United Kingdom, United States

On July 24, 2024, the European Commission, CMA, DOJ (Antitrust Division of the United States Department of Justice), and FTC jointly issued a declaration on competition for generative AI foundation models and AI products<sup>27</sup>. The main points are as follows:

- While law enforcement is subject to the independent decision-making of national competition authorities, AI-related risks are often cross-border. Therefore, it is important to share an understanding of these issues and, when necessary, to exercise their respective powers collaboratively.
- Threats to competition in the AI market include the risk that a few companies might exploit bottlenecks in existing or emerging AI-related fields, allowing them to exert excessive influence over the future development of specialized chips, massive computing power, and other critical resources. Additionally, there is a concern that the dominant positions established by large companies through past technological transformations could become entrenched, hindering future competition.
- To promote competition and foster innovation in the AI ecosystem, it is essential to ensure fair trade practices, interoperability, and other supportive measures.

#### 5 France

On February 8, 2024, the French Competition Commission issued a call for comments on generative AI, with a deadline of March 22, 2024<sup>28</sup>. The French authority sought information on the strategies of major digital companies in the generative AI market, focusing on practices in the cloud services market and issues related to access to cloud services, data, and expert talent necessary for developing

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<sup>24</sup> [Generative AI Raises Competition Concerns | Federal Trade Commission \(ftc.gov\)](#)

<sup>25</sup> [FTC Tech Summit | Federal Trade Commission](#)

The FTC Tech Summit brought together professionals from various positions in academia, industry, civil society, and government for three panels focusing on different layers of AI: hardware and infrastructure, data and models, and consumer applications.

<sup>26</sup> [Semiconductor Chips & Cloud Computing: A Quote Book | Federal Trade Commission \(ftc.gov\)](#) (March 14, 2024)

[Data and Models: A Quote Book from the Tech Summit on AI | Federal Trade Commission \(ftc.gov\)](#) (April 17, 2024)

[Consumer Facing Applications: A Quote Book from the Tech Summit on AI | Federal Trade Commission \(ftc.gov\)](#)

(April 24, 2024)

<sup>27</sup> [Joint Statement on Competition in Generative AI Foundation Models and AI Products - European Commission \(europa.eu\)](#)

[Joint statement on competition in generative AI foundation models and AI products - GOV.UK \(www.gov.uk\)](#)

[Office of Public Affairs | Leaders of Justice Department, Federal Trade Commission, European Commission and U.K.](#)

[Competition and Markets Authority Issue Joint Statement on AI Competition | United States Department of Justice](#)

[FTC, DOJ, and International Enforcers Issue Joint Statement on AI Competition Issues | Federal Trade Commission](#)

<sup>28</sup> [Generative artificial intelligence: the Autorité starts inquiries ex officio and launches a public consultation open until Friday, 22 March | Autorité de la concurrence \(autoritedelaconcurrence.fr\)](#)

foundation models. Following this call for comments, a report was published on June 28, 2024<sup>29</sup> that highlighted high barriers to entry in the generative AI market and the increasing advantages generative AI provides to businesses in other digital areas. It also outlined competition concerns upstream in the value chain and made recommendations to address these issues.

On September 27, 2023, the French Competition Commission conducted a court-authorized inspection of a company suspected of carrying out anti-competitive practices in the graphic cards sector<sup>30</sup>.

## 6 Canada

On March 20, 2024, the Competition Bureau Canada published a discussion paper<sup>31</sup> on competition in generative AI and invited public comments (deadline: July 7, 2024). The purpose was to deepen understanding and promote discussion on the development of competition in generative AI markets, how competition can be protected and promoted, and how to address potential concerns.

## 7 South Korea

On August 1, 2024, the Korea Fair Trade Commission (KFTC) announced that it would launch a fact-finding survey of major domestic and foreign operators in the AI sector to proactively understand potential competition and consumer rights issues<sup>32</sup>.

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<sup>29</sup> [Generative artificial intelligence: the Autorité issues its opinion on the competitive functioning of the sector | Autorité de la concurrence \(autoritedelaconcurrence.fr\)](#)

<sup>30</sup> [The General Rapporteur of the Autorité de la concurrence indicates that an unannounced inspection was carried out in the graphics cards sector | Autorité de la concurrence \(autoritedelaconcurrence.fr\)](#)

The Competition Commission made an announcement regarding the inspection in a press release, but did not disclose details.

<sup>31</sup> [Competition Bureau seeks feedback on artificial intelligence and competition - Canada.ca](#)

<sup>32</sup> [https://www.ftc.go.kr/www/selectReportUserView.do?key=10&rpttype=1&report\\_data\\_no=10747](https://www.ftc.go.kr/www/selectReportUserView.do?key=10&rpttype=1&report_data_no=10747)