**DRAFT - Response from the International Chamber of Commerce to the European Commission’s Call for Contributions on competition in generative AI and virtual worlds**

***Generative AI***

The International Chamber of Commerce (ICC) – as the institutional representative of more than 45 million companies in over 100 countries – welcomes the opportunity to participate in the European Commission’s Call for contributions.

The ICC expresses its appreciation for the Commission's interest in comprehending the possible impact of generative AI systems on competition and innovation in the digital economy. Generative AI is a rapidly evolving and promising field of artificial intelligence that can produce novel and realistic content, such as text, images, audio or video, based on existing data or models. Generative AI has a broad range of applications across various sectors and domains, such as education, entertainment, health, finance, manufacturing, or public services.

The current EU competition rules seem flexible and adaptable enough to cope with any potential anticompetitive conduct or market distortions arising from generative AI systems, without the need for new regulations or guidelines. Competition law is nevertheless not the suitable tool to address wider societal or ethical concerns that may arise from the use of generative AI, such as misleading or biased content, intellectual property rights, or democratic values. These issues should be addressed by other policy instruments, such as sector-specific regulation, self-regulation, or codes of conduct, taking into account the views and interests of all relevant stakeholders. The ICC also considers that any premature or disproportionate regulatory interventions could impede the development and adoption of generative AI technologies in Europe and globally.

1. The ICC invites the Commission to adopt a balanced and evidence-based approach to the assessment of generative AI systems, taking into account both the potential benefits and risks of these technologies, as well as the diversity and dynamism of the markets and industries where they are deployed. In this context, the ICC believes that the Commission is going in the right direction with this Call for contributions. Finally, we encourage the Commission to foster dialogue and cooperation with other jurisdictions and international organizations to ensure a coherent and consistent global framework for generative AI that supports innovation and competition, while respecting human rights and fundamental values.***What are the main components (i.e., inputs) necessary to build, train, deploy and distribute generative AI systems? Please explain the importance of these components***

The ICC considers that the main components necessary to build, train and distribute generative AI systems (or Foundation Models (“**FMs**”))[[1]](#footnote-2) are data, compute capacity, and technical expertise.

* Data is needed at both stages of training: (i) pre-training, where data is used to build the FM’s knowledge; and (ii) fine-tuning, where the FM’s accuracy is improved through dedicated training.
* Significant compute capacity is required to train FMs.
	+ Because of the size of the model and the amount of data used to train the model, FMs require a significant number of AI accelerator chips (such as graphic processing units – “**GPUs**”) installed in large data centers. NVIDIA is the leader in the production and supply of GPUs. Some FM developers have their own AI accelerator chips. For example, Google manufactures an AI accelerator called the tensor processing unit (“**TPU**”).
	+ FM developers can also turn to cloud service providers to have access to this type and scale of compute capacity. These cloud providers need access to enough GPUs or other AI accelerators to be able to service their FM customers. Providers of cloud compute include Alibaba (Alicloud) Amazon Web Services (AWS), Baidu, Bytedance, Google Cloud Platform (GCP), Huawei, IBM Cloud, Microsoft Azure, Oracle Cloud Infrastructure, and Tencent, as well as smaller cloud providers such as Aligned, Arkon Energy, Cirrascale, Crusoe, Denvr Dataworks, and TensorWave. In addition, an increasing number of specialized AI cloud providers, such as CoreWeave, Hewlett Packard Enterprise, Lambda Labs, NVIDIA and Scaleway, have been emerging in response to the increased demand for AI accelerators. Alternatives such as publicly owned supercomputers are also emerging (e.g. the supercomputing center of the French National Center for Scientific Research, and Leonardo, a high-performance computing cluster based in Italy which is open and available free of charge for industrial and scientific computing).
* FM development also requires a combination of talent and technical expertise. This includes data scientists and engineers, machine learning skills, programming, mathematics and statistics. The skills and expertise needed may vary depending on the type and complexity of the FM (e.g. expertise or knowledge of image data, natural language processing, or music generation).

***2) What are the main barriers to entry and expansion for the provision, distribution or integration of generative AI systems and/or components, including AI models? Please indicate to which components they relate.***

To the ICC’s knowledge, none of the main components mentioned above are monopolized by any single entity. To the contrary, the significant growth and the number and diversity of players[[2]](#footnote-3) in the generative AI space, including many start-ups, evidence the fact that, thus-far, there are no significant barriers to entry or expansion. Anthropic, Adept, Inflection and Mistral, for example, were all founded less than 2 years ago and are already some of the most promising players in the AI space. In addition, the availability of FMs through APIs and open-source licenses enables new entrants to enter and scale quickly.

***3) What are the main drivers of competition (i.e., the elements that make a company a successful player) for the provision, distribution or integration of generative AI systems and/or components, including AI models?***

The ICC considers that competition may occur at various levels of the AI technology stack:

* **AI accelerator chips**. Training FMs requires a significant number of GPUs installed in data centers. NVIDIA is the leader in the production and supply of GPUs. Some FM developers have their own AI accelerator chips (e.g. Google manufactures TPUs), while others are developing them (e.g. AWS Trainium, Meta Training and Inference accelerator, IBM Telum and Microsoft Maia), or have supported other silicon suppliers to enter the market (e.g. Microsoft, Meta, Databricks, Essential AI and Lamini, among others, are working on deploying new AMD accelerators for AI workloads). In addition, because of the increasingly crowded downstream space, there is pressure on the upstream GPU suppliers, and more companies are pushing into the silicon space (including start-up manufacturers SambaNova, Cerebras, Graphcore, Groq and Mythic).
* **Compute infrastructure**. Providers of cloud compute, include Alibaba (Alicloud), Amazon Web Services (AWS), Baidu, Bytedance, Google Cloud Platform (GCP), Huawei, IBM Cloud, Microsoft Azure, Oracle Cloud Infrastructure, Tencent, NVIDIA, CoreWeave, Aligned, Arkon Energy, Cirrascale, Crusoe, Denvr Dataworks, TensorWave, HPE, Lamda and Scaleway.

In addition, there are emerging alternatives, such as publicly owned supercomputers, as well as EU-level efforts to make European supercomputers available to innovative European AI start-ups to train their FMs (*e.g.* the launch of the European Commission’s AI innovation package to support AI start-ups and SMEs in January 2024).

Competition to attract FM developers to cloud is intense. FM developers expect significant and stable cloud capacity and performance, and the growing demand for placing AI workloads is increasing competition at the compute layer.

* **Data**. FM developers need data to train the models they are developing. The most important factors are the scale and the quality of the data. Data can either be proprietary (e.g. academic journals, image repositories, coding companies and content websites) or open source (including other FMs).

In the pre-training phase, where data is used to build the model’s knowledge, training can be successfully carried out with publicly available datasets (e.g. C4, The Pile, Project Gutenberg Corpus and Starcoder). For example, LlaMA (Meta), GPT-3 (OpenAI) and Stable Diffusion (StabilityAI) have been pre-trained entirely on open source data.

In the fine-tuning phase, where the model’s accuracy is improved through dedicated training, data is often human generated in-house or sourced from specialist third-party data providers such as Scale AI, Prolific, Surge AI, Super Annotate or Dataloop.

* **FM development**. Development and supply of FMs is still in its early stage and FM developers face increasing and strong competition from new entrants[[3]](#footnote-4). There is strong demand for new and different models. Models are selected by customers to provide specific capabilities, balancing various characteristics, including performance and cost. The most important factor is the performance of any FM on the customer’s particular task, rather than which company offers the model, how many parameters the model has or how the model is made available. The pool of FM developers is constantly increasing, with a large variety of end products (large language models, but also smaller, more cost-effective language models, as well as models specialized in video or image generation).
* **Downstream FM applications**. The application layer encompasses applications that incorporate FMs. Consumers can interact with FMs in many ways. Some FMs are deployed as standalone services such as chatbots (e.g. Inflection’s Pi, OpenAI’s ChatGPT or Google’s Gemini) and virtual assistants (e.g. Otter, Fireflies, Google Assistant, Amazon Alexa or Microsoft’s Copilot), others are integrated with existing services or are add-ons to existing applications and services.

The development of downstream FM applications has been growing rapidly across a variety of industries including education (e.g. Khanmigo), catering (e.g. OpenTable AI), productivity (e.g. Geppettochat), marketing (e.g. Jasper AI) and many others. While these downstream FM services make use of similar technological inputs, competition occurs at the level of the individual application. There is strong competition between suppliers to innovate and differentiate their offerings.

***4) Which competition issues will likely emerge for the provision, distribution or integration of generative AI systems and/or components, including AI models? Please indicate to which components they relate.***

It is difficult for the ICC to predict what kind of competition issue may emerge in this fast-evolving market. It is also unclear at this stage how forthcoming regulation will affect competition and to what extend potential concerns will be addressed in particular by the DMA.

Some national competition authorities have identified various possible areas of concern. Among them, given the increasing need for data as the market develops, data access seems to be an important one. To accelerate advances and maintain competitiveness, data must be broadly available and accessible on reasonable terms. So far, many FM developers have used public data to train and create generative AI models. However, access to data may be restrained by IP laws depending on how they will apply to generative AI. Similarly, as models may need more and diverse data to improve and compete, proprietary data sets will probably become more determinative and privileged access to those data may constitute a competitive advantage.

Given the current level of uncertainty, the ICC considers that the Commission is going in the right direction with the present consultation, which will allow the Commission to gather important market information so as to be able to react quickly with its existing tools in case competition issues materialize.

***5) How will generative AI systems and/or components, including AI models likely be monetised, and which components will likely capture most of this monetization?***

There is potential for monetization across the various layers of the AI technology stack:

* **AI accelerator chips**. The main supplier of GPUs for AI purposes is NVIDIA, who sells its GPUs to cloud providers or to FM developers directly. For example, Meta announced that it would install 350,000 of NVIDIA’s H100 GPUs in its data centers by the end of 2024. According to public sources, NVIDIA’s stock price has more than quadrupled over the past three years.
* **Compute resources**. Cloud compute providers sell cloud capacity (i.e. access to GPUs installed in their data centers) to FM developers.
* **Data**. Datasets can be proprietary and may be licensed to FM developers for the purposes of training a model. Other data sets are open source and are publicly available for download.
* **FMs and FM applications**. FMs can be accessed through downloading the model or via APIs, either directly, through a third-party distribution channel (e.g. Azure AI Studio, Google Vertex AI, Amazon Bedrock, Alibaba Cloud and Oracle Generative AI) and/or through open model registries (e.g. Hugging Face). This can include both pre-trained models and models that are fine-tuned for specific use cases. Each of these methods of accessing FMs allows the customer to fine tune the FM to their own needs, integrate the FM into their own products or services, and/or deploy it in their businesses directly. Equally, FM developers can develop and sell products or services that are powered by their models. This can include chatbots, virtual assistants, and other AI-powered tools. FM applications can be accessed through download from an app store (e.g. Inflection’s Pi is available on both Android and iOS).

***6) Do open-source generative AI systems and/or components, including AI models compete effectively with proprietary AI generative systems and/or components? Please elaborate on your answer.***

Open-source generative AI systems and components, including AI models, are capable of effectively competing with proprietary AI generative systems and components. Developers of downstream foundation model services, such as chatbots and other AI assistants, can capitalize on the availability of multiple open-source models and API-based offerings within the industry. These offerings are provided by various foundation model suppliers and cloud service providers, including Amazon, Anthropic, Azure, Cohere, Databricks, Google Cloud Platform, Hugging Face, Meta, Mistral, NVIDIA, OpenAI, Salesforce, Stability AI.

Many developers are utilizing open-source models to create their own customized downstream foundation model services. Additionally, developers can leverage existing foundation model applications to build use-case-specific applications on top of existing foundation model-based services, such as ChatGPT. This allows for the development of numerous foundation model-based applications across various industries, including education (e.g. Khanmigo), catering (e.g. OpenTable AI), productivity (e.g. Geppettochat), marketing (e.g. Jasper AI).

While these downstream foundation model services utilize similar technological inputs, competition occurs at the level of individual applications.

***7) What is the role of data and what are its relevant characteristics for the provision of generative AI systems and/or components, including AI models?***

Please refer to our responses to Questions 1 and 3 above.

***8) What is the role of interoperability in the provision of generative AI systems and/or components, including AI models? Is the lack of interoperability between components a risk to effective competition?***

To the ICC’s knowledge, FMs are generally interoperable. Chatbots and virtual assistants are often created by combining different FMs from different developers. For example, Perplexity runs on OpenAI’s GPT-3.5 model along with Perplexity’s own FM, which in turn is a variant of Meta’s open source LlaMa2 model. Similarly, Perplexity’s Pro version runs on OpenAI’s GPT-4 model and Anthropic’s Claude.

***9) Do the vertically integrated companies, which provide several components along the value chain of generative AI systems (including user facing applications and plug-ins), enjoy an advantage compared to other companies? Please elaborate on your answer.***

Each component of the AI stack (please refer to our response to Question 3) plays a crucial role in the seamless development, deployment, and optimization of AI systems. To the ICC’s knowledge, there are very few players that are highly integrated or even cover the whole AI stack and no company controls all of these components.

Many technology companies active in the generative AI field operate at different levels of the AI stack. However, most of them still need to collaborate or enter partnerships with other parties to be able to successfully bring their products or services to the market. For example, some companies provide computing infrastructure and tools optimized for AI workloads, are developing and training generative AI models, and have products and services that use those and other AI models. At the same time, these (sometimes large) companies need to rely on partnerships to get other key inputs like semiconductors or data for training and are dependent on these partnerships so that they cannot decide on market dynamics.

Competition authorities have adequate tools at their disposal to deal with vertical integration in case they identify a concern. In particular, merger control and rules against abuses of dominance have been successfully used many times in the past to address potential anti-competitive effects resulting from vertical integration.

 ***10) What is the rationale of the investments and/or acquisitions of large companies in small providers of generative AI systems and/or components, including AI models? How will they affect competition?***

Larger technology companies as well as venture capital are providing funding to start-ups in various forms: for example, by direct investments, convertible debt, or by forming commercial or strategic partnerships. Many start-ups’ entry has been enabled or accelerated by investments or partnerships, such as Adept, AI21 Labs, Aleph Alpha, Anthropic, Cohere, Databricks, Deci, EvolutionaryScale, Inflection, Mistral OpenAI and Stability AI.

These investments and partnerships generally drive competition and lead to benefits and efficiencies. They enable start-ups to quickly enter and expand into AI by providing them with access to funding and/or cloud computing resources they may not otherwise have. This accelerates the overall pace at which entry and expansion occur in AI, inevitably resulting in more innovation and choice:

* The investments and partnerships enable start-ups to develop, train and commercialize their products and services much faster.
* FM technology is general-purpose in nature and improvements in FM technology facilitate complementary innovation across the myriad of different applications that can make use of this technology. There can be an important “knowledge-spillover” effect from start-ups’ innovation efforts onto companies which are implementing this technology. Innovations in FMs spur further innovation within the implementers’ solutions. When the implementers are also the partners of/investors in the FM start-up, the expected innovation benefits are likely to be the largest.
* Similarly, the general-purpose nature of FM technology means that it is optimal for start-ups’ technology to be built upon by third parties. Third parties can combine the underlying FMs with their own expertise in, for example, product development. This complementarity is likely to increase incentives to innovate.

***11) Do you expect the emergence of generative AI systems and/or components, including AI models, to trigger the need to adapt EU legal antitrust concepts?***

The current antitrust framework and legislation seem sufficient. Among others, the Digital Markets Act, the EU Merger Regulation, and Regulation 1/2003 are potent tools to address any potential concerns. Where needed, the development of new informed theories of harm seems sufficient to “adapt” the EU’s existing framework to generative AI systems and components.

***12) Do you expect the emergence of generative AI systems to trigger the need to adapt EU antitrust investigation tools and practices?***

As generative AI continues to evolve, it will presumably introduce novel challenges and opportunities. Therefore, vigilant monitoring of the generative AI landscape by competition authorities is essential. While some specific areas may warrant closer scrutiny, the ICC does not think that the Commission needs new investigation tools or practices as the current tools, like DG COMP’s Data Analysis and Technology unit, are sufficiently effective to detect potential concerns.

***Virtual Worlds***

Virtual Worlds may be described as immersive digital environments that simulate physical or imaginary worlds and allow users to interact with them. Virtual Worlds can have different purposes, such as entertainment, education, social networking, or business. They can target different audiences, such as consumers (B2C) or enterprises (B2B). As a general comment, the ICC considers that it is key to understand the competitive dynamics of the market, to differentiate the Industrial B2B Virtual Worlds from the B2C Virtual Worlds. The B2C segment is consumer-focused (e.g. gaming, social media) and has its own dynamics and challenges like asymmetric negotiation power and the need to protect personal data. Industrial Virtual Worlds (B2B) intend to help companies to optimize their real-world assets and applications. Industrial Virtual Worlds are an evolution that builds on an increasing technology convergence, which together with other developments such as the growth of computing capacities and communication infrastructure, and access to machine data leads to huge opportunities and possibilities to test, control, change and improve industrial processes and products by using photo-realistic, real-time industrial digital twins. The B2B segment is more recent and dynamic and involves many players which offer solutions to experience and interact with a digital twin (i.e. a virtual representation of a physical asset, process, or system). ***1) What entry barriers or obstacles to growth do you observe or expect to materialise in Virtual World markets? Do they differ based on the maturity of the various markets?***

Entry barriers and obstacles to growth in Virtual World markets can vary based on a variety of factors, including the maturity of the markets:

* **Entry cost**: Establishing a Virtual World platform involves costs. In particular, infrastructure (servers or cloud resources), development, and marketing expenses can be substantial.
* **Expertise**: Developing Virtual World technology requires expertise in technologies like 3D graphics or physics simulations. This expertise and the development effort can be outsourced to third parties.
* **Intellectual Property***:* In some instances, openness can lead to conflicts over intellectual property rights protection and monetization models. Companies investing in Virtual Worlds development may seek to protect their investments through proprietary systems. On the other hand openness and interoperability are very important factors to attract third parties providers on a virtual world which in turn can be key to reduce own development time and to create an attractive, more comprehensive offering for the customers.

Overall, while some barriers may be more important in either mature or emerging markets, many of these challenges are universal and require careful consideration and strategic planning by companies looking to enter or expand in the Virtual World market. Adaptability, innovation, and a deep understanding of local market dynamics are essential for overcoming these obstacles and driving growth in both mature and emerging markets.

***2) What are the main drivers of competition for Virtual World platforms, enabling technologies of Virtual Worlds and/or services based on Virtual Worlds (e.g. access to data, own hardware or infrastructure, IP rights, control over connectivity, vertical integration, platform and payment fees)? Do you expect that to change and, if so, how?***

The main drivers of competition for Virtual World platforms, enabling technologies, and services based on Virtual Worlds can be categorized into several key factors:

* **Access to Data**: Virtual World platforms compete based on their ability to gather, process, and utilize user data to enhance user experiences, improve content creation, and provide targeted advertising.
* **Own Hardware or Infrastructure**: Companies may compete based on the quality, scalability, and efficiency of their hardware infrastructure to support Virtual World experiences, such as servers, cloud resources and networking equipment. Many virtual world operators outsource this component to third parties.
* **IP Rights**: Securing intellectual property rights over unique Virtual World content, including characters, environments, and interactive elements, can be a competitive advantage for platforms and content creators.
* **Control over Connectivity**: Ensuring reliable and low-latency connectivity is crucial for delivering immersive Virtual World experiences. Companies may compete based on their control over network infrastructure or partnerships with internet service providers. In the industrial space, **real-time connectivity** including cybersecurity will be key for the high demands of industrial applications (5G/6G).
* **Open APIs** that allow to connect assets, products and software from different vendors to the Virtual World and enable a seamless communication within the Virtual World.
* **Ability to use and interpret the data** through domain know-how that creates value for customers.
* **Vertical Integration**: Integration of various components of the Virtual World ecosystem, including hardware, software, content creation tools, know-how, can provide advantages in terms of efficiency, innovation, and user experience.
* **Platform and Payment** Fees: The cost structure of Virtual World platforms, including fees for accessing the platform, purchasing virtual goods and services, or conducting transactions within the virtual environment, can influence competition by affecting both users and content creators.

These drivers of competition are likely to evolve over time due to technological advancements, changes in user preferences, regulatory developments, and competitive dynamics within the industry.In the B2B segment, investments and complementary knowledge are required in the Industrial Virtual World which is why new forms of partnerships and ecosystems are likely to play an important role in the sector.

***3) What are the current key players for Virtual World platforms, enabling technologies of Virtual Worlds and/or services based on Virtual Worlds, which you consider or expect to have significant influence on the competitive dynamics of these markets?***

Several key players operate on the Virtual World platforms and enabling technologies space:

* **Meta**: Meta is a major player in the Virtual World space through its Oculus brand. Oculus Rift and Oculus Quest are leading VR headsets, and Meta has been investing heavily in virtual reality technologies and platforms. Its social B2C VR platform, Horizon, aims to create immersive virtual environments for social interaction.
* **Apple:** Apple recently released its Vision Pros.
* **Roblox Corporation**: Roblox is a user-generated content platform where users can create and play games created by other users. It has gained immense popularity, especially among younger audiences, and has a significant presence in the Virtual World market. Roblox allows developers to monetize their creations and has become a hub for virtual experiences.
* **Unity Technologies**: Unity is a leading game development platform that also supports the creation of Virtual Worlds. Its engine powers a significant portion of virtual reality experiences, enabling developers to create immersive environments and simulations across various platforms.
* **Epic Games**: Epic Games, the company behind the Unreal Engine, has a significant influence on Virtual Worlds through its technology and platforms. Fortnite, one of Epic Games' flagship titles, has evolved into a Virtual World platform beyond just a battle royale game, hosting concerts, events, and social spaces.
* **Sony**: Sony, through its PlayStation VR platform, is a key player in the virtual reality space, particularly in the gaming sector. With its PlayStation console ecosystem and VR hardware, Sony has established a significant presence in the market.
* **HTC**: HTC's Vive VR headsets have been popular choices for high-end virtual reality experiences. HTC has been actively involved in developing VR technologies and collaborating with developers to create immersive content.
* **Microsoft**: Microsoft has been investing in virtual reality and augmented reality through its HoloLens devices and Mixed Reality platform.
* **Snap Inc**.: Snap Inc., known for its Snapchat app, has been exploring augmented reality technologies through its Spectacles and AR filters.

***4) Do you expect existing market power to be translated into market power in Virtual World markets?***

The dynamics of Virtual World markets may differ from traditional markets, with factors such as user engagement, content creation, and network effects playing significant roles. Success in Virtual Worlds may require more than just existing market power. It may also demand innovation, user-centric design, and effective ecosystem management.

Since access to data is essential for sustaining and improving Virtual Worlds, any exclusive or privileged access to relevant data may translate into market power in Virtual World markets.

***5) Do you expect potential new entrants in any Virtual World platforms, enabling technologies of Virtual Worlds and/or services based on Virtual Worlds in the next five to ten years and if yes, what products and services do you expect to be launched?***

It seems very likely that we will see new entrants in the Virtual World platforms, as well as advancements in enabling technologies and services based on Virtual Worlds in the next five years. In particular, the B2B segment is an **emerging market** with a significant number of different players, many of which are **new entrants**. The continued growth of virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies, along with the increasing demand for immersive experiences, suggests a fertile ground for innovation in this space.

Potential new products and services that could include next-generation Virtual World platforms, Industrial Virtual Worlds, advanced hardware, virtual events and experiences or virtual education and training.

***6) Do you expect the technology incorporated into Virtual World platforms, enabling technologies of Virtual Worlds and services based on Virtual Worlds to be based mostly on open standards and/or protocols agreed through standard-setting organisations, industry associations or groups of companies, or rather the use of proprietary technology?***

The direction of technology incorporation in Virtual World platforms can vary, and it often depends on a combination of factors including market trends, industry standards, and the strategic decisions of companies involved. However, there has been a noticeable trend towards incorporating open standards and protocols in Virtual World technology.

Open standards and protocols offer several advantages, including interoperability between different platforms, increased flexibility, and greater accessibility for developers and users. Additionally, they can promote innovation by enabling collaboration and the sharing of ideas and resources across different organizations and industries.

Many companies and organizations within the Virtual World space recognize the benefits of open standards and actively participate in standard-setting organizations, industry associations, and collaborative efforts to develop and promote these standards.

That said, proprietary technology still plays a significant role in Virtual World platforms, particularly when it comes to unique features and proprietary software. Companies may choose to develop proprietary technology to differentiate their platforms or protect their intellectual property.

Overall, while both open standards and proprietary technology are likely to continue coexisting in the Virtual World landscape, the adoption of open standards is expected to grow significantly as the industry matures and as more stakeholders recognize the benefits of interoperability and collaboration.

***7) Which data monetisation models do you expect to be most relevant for the development of Virtual World markets in the next five to ten years?***

The development of Virtual World markets is likely to see several data monetization models becoming increasingly relevant in the next five to ten years, including:

* **Virtual Goods Sales**: This model involves selling virtual items within the Virtual World, such as clothing, accessories, virtual real estate, or digital pets. These items can be sold for real money or virtual currency, generating revenue for the platform.
* **Advertising and Sponsorship**: Virtual Worlds can offer advertising space and sponsored events to brands looking to reach a highly engaged audience. This model involves displaying ads or sponsoring in-world events, experiences, or products.
* **Data Analytics and Insights**: Virtual Worlds generate vast amounts of user data related to user behavior, preferences, and interactions. Platforms can monetize this data by offering analytics and insights to businesses looking to understand consumer behavior in virtual environments.
* **Subscription Services**: Offering premium subscriptions with access to exclusive content, features, or virtual goods can be a lucrative monetization strategy for Virtual World platforms. Subscriptions can provide a steady stream of revenue while fostering customer loyalty.
* **User-Generated Content Marketplace**: Virtual World platforms can facilitate the creation and sale of user-generated content such as avatars, clothing, accessories, and virtual assets. They can take a commission from each transaction within the marketplace.
* **Licensing and Partnerships**: Virtual Worlds can enter into licensing agreements with brands, intellectual property owners, or entertainment companies to incorporate branded content, characters, or experiences within the virtual environment.

Overall, the successful monetization of Virtual Worlds will likely involve a combination of these models, tailored to the specific characteristics of the platform and the preferences of its user base. Additionally, ensuring a balance between monetization strategies and user experience will be crucial for sustained growth and profitability.

**8) What potential competition issues are most likely to emerge in Virtual World markets?**

Overall, the ICC sees an important opportunity for European industry including small and medium sized companies to participate and grow in the Virtual World market. It is difficult for the ICC to predict what kind of competition issue may emerge in this fast-evolving market. It is also unclear at this stage how forthcoming regulation will affect competition and to what extend potential concerns will be addressed, notably by the DMA.

It is important to differentiate between B2B and B2C (e.g. gaming, social media) segments. The B2C segment is potentially more static, more characterized by network effects and behavioral bias and therefore more prone to tipping. The B2B segment is more complex, industry-focused, and more dynamic. Trying to regulate the B2B segment has an even higher risk of negative consequences including harm to competition, European competitiveness, and innovation.

**9) Do you expect the emergence of new business models and technologies to trigger the need to adapt certain EU legal antitrust concepts?**

The current antitrust framework and legislation seem sufficient. It is difficult to predict legal frameworks for technologies and business models that do not exist today. In view of the openness of the DMA to address new problems, there seems to be a sufficiently adaptable regulatory framework to react to new technologies and market dynamics.

***10) Do you expect the emergence of new business models and technologies to trigger the need to adapt EU antitrust investigation tools and practices?***

The ICC does not think that the Commission needs new investigation tools or practices. The Commission’s current tools seem sufficiently effective to address potential concerns. In view of a large number of new tools in Europe and internationally, their interaction and impact on competition and competitiveness should be studied carefully before any further legislative action is taken.

1. FMs can be defined as a type of AI model that are trained on large amounts of data and can be adapted to a wide range of operations. [↑](#footnote-ref-2)
2. FM developers and providers include: AI21 Labs, Amazon, Aleph Alpha, Alibaba, Anthropic, Anyscale, Baidu, Cohere, Databricks, Deci, Eleven Labs, Fireworks AI, Google, Gretel AI, Hugging Face, Huawei, IBM, Inflection, Intel, Kakao Brain, Meta, Microsoft, Mistral, Naver, Nixtla, NVIDIA, OpenAI, Oracle, Perplexity AI, Replicate, Stability AI, Tencent, Technology Institute Abu Dhabi, Together AI, Writer and Yandex. [↑](#footnote-ref-3)
3. FM developers and providers include: AI21 Labs, Amazon, Aleph Alpha, Alibaba, Anthropic, Anyscale, Baidu, Cohere, Databricks, Deci, Eleven Labs, Fireworks AI, Google, Gretel AI, Hugging Face, Huawei, IBM, Inflection, Intel, Kakao Brain, Meta, Microsoft, Mistral, Naver, Nixtla, NVIDIA, OpenAI, Oracle, Perplexity AI, Replicate, Stability AI, Tencent, Technology Institute Abu Dhabi, Together AI, Writer and Yandex. [↑](#footnote-ref-4)