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INTRODUCTION

The Information Technology and Innovation Foundation (ITIF; Transparency Register #: 923915716105-08), the world's leading think tank for science and technology, appreciates the opportunity to contribute to the European Commission's consultation on "Competition in Virtual Worlds and Generative AI." This submission represents feedback from the Center for Data Innovation (Transparency Register #: 367682319221-26) and ITIF's Schumpeter Project on Competition Policy.

SUMMARY

This submission considers competition issues impacting two important emerging technologies.

First, the market for augmented reality and virtual reality (AR/VR) technologies (i.e., the virtual worlds market), though nascent, presents a multifaceted competitive landscape spanning hardware, software, and distribution. While the potential for mutual benefit exists within the ecosystem, natural market concentration could occur in the future, potentially streamlining operations and benefiting users. However, complex and inconsistent regulations, particularly regarding data protection, can significantly hinder the growth of virtual world platforms, especially for startups. As the technology is still evolving, it is too early to predict which companies will dominate the market, and existing market power in other sectors does not necessarily translate to dominance in the metaverse. The debate between open standards and proprietary technology is ongoing. Some advocate interoperability to avoid siloed experiences, while others see value in closed ecosystems for specific needs like security. Regardless of the chosen model, fostering competition between them will likely benefit consumers and drive innovation. Currently, paid downloads and subscriptions are the primary revenue models, but alternative models like targeted advertising and blockchain-based peer-to-peer transactions are also emerging. The market is fragmented, so it is hard to predict the future, but potential antitrust concerns similar to those in traditional markets might arise in the future. However, existing legal frameworks can adapt to address these issues without requiring fundamental changes.

Second, the generative AI market is experiencing early-stage growth with no significant entry barriers evident, particularly concerning data, computational resources, and talent. Companies like OpenAI, Anthropic, and Mistral AI have succeeded in developing leading models despite not having the large user data sets of large platforms. Competition exists at multiple levels, including among cloud providers like Google, Microsoft, and Amazon, and chip manufacturers such as Nvidia, AMD, and Intel. And while firms compete for talent, Mistral AI has demonstrated it is possible to be successful with a small team. Competition among firms making generative AI models centers on performance, price, speed, interface, licenses, customization, and

specialization. Varying degrees of vertical integration among large tech companies, such as Meta, Amazon, and Google, as well as different approaches to producing open-source versus proprietary generative AI models, indicate firms are pursuing different strategies which provides users with more choice. Finally, acquisitions and partnerships between established firms and emerging ones fuel growth and innovation and foster competition.

VIRTUAL WORLDS

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?

Regulatory barriers pose a significant challenge, notably in raising the cost of entry to markets and making it more difficult to scale up businesses, particularly for startups. Non-uniform regulations across jurisdictions can exacerbate this challenge, hindering the expansion of virtual world platforms. For example, complex, contradictory, and duplicative data protection regulations, particularly concerning biometric data and bystander privacy, can create significant hurdles. Compliance with stringent data protection measures may not only require substantial financial investments but also implementing technical adaptations. Similarly, restrictions on targeted advertising could impede growth, constraining how companies can reach potential customers and monetize their services. Additionally, regulations governing the provision of services to youth impose restrictions that may limit the scope of virtual world platforms, curtailing their potential user base and revenue streams. Finally, laws and regulations designed for existing, centralized services might not work well for newer, decentralized ones, creating even more challenges.

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?

Competition within the metaverse ecosystem is multifaceted, spanning various layers of the AR/VR stack, from hardware components to distribution platforms and applications. This includes components like displays, cameras, and controllers, as well as devices such as headsets and handheld devices. Additionally, competition extends to 3D capture, audio and video tools, software development kits, and distribution platforms, among others.[1] One notable aspect of competition in this space is the potential for mutual benefit. For instance, the success of a VR game can attract more users to the platform, thereby creating opportunities for other gaming companies to sell their rival games. Similarly, the success of a VR headset can broaden the appeal of the metaverse to users, ultimately lowering barriers to adoption for other players in the market. To be sure, by virtue of these positive network externalities, as AR/VR technologies mature there may be a shift towards natural market concentration. While this may seem counterintuitive to competition, it can actually streamline the ecosystem and benefit stakeholders. For example, fewer competing development platforms can make it easier to deploy applications across multiple devices, enhancing interoperability and user experience, as well as incentivizing follow-on incremental innovations that benefit consumers.

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?

The market for metaverse platforms is still nascent. Between 2016 and 2021, the three leading VR headset makers—Meta, Sony, and HTC—sold 20.3 million units globally, with the Quest 2 accounting for three-fourths of those sales.[2] To put this in comparison, Apple sold 232 million iPhones in 2023 alone.[3] Similarly, Meta's Quest platform reportedly had 6.4 million monthly active users as of October 2022 whereas Sony's PlayStation gaming platform has 112 million monthly active users during the same period.[4] Given the early stage of this technology, it is too soon to determine if any of the initial key players will have a significant influence on the competitive dynamics of the market. For example, it remains to be seen whether consumers will adopt more premium headsets, such as the Apple Vision Pro or Microsoft HoloLens, or more affordable headsets, such as the Meta Quest 2 or HTC Vive Cosmos. Given the relatively small size and unpredictability of the market for metaverse platforms, no company has sufficient market power to distort competition.

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

Nobody can predict the future, and competition authorities should not base policy decisions today on any such unprovable, speculative claims about tomorrow. Some businesses with existing market power in current digital technologies are investing their resources in developing next-generation technologies and it is possible that they will emerge as leaders in immersive technologies. However, their success in future technologies is not a foregone conclusion. History shows that competition often comes from disrupters who challenge dominant firms with new technologies (what Austrian economist Joseph Schumpeter famously termed "creative destruction"), such as online streaming companies displacing video rental stores. Indeed, the threat of disrupters challenging today's leading platforms is one reason some existing technology companies are investing in research and development (R&D) for new products and services related to the metaverse.

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?

As noted above, disruptive innovations are invariably accompanied by new firms challenging old incumbents, and AR/VR markets are no different. Additionally, ITIF has co-organized the AR/VR Policy Conference every year since 2021 with the XR Association.[5] Over these three years, there has been a steady influx of new ideas, products, and businesses working in the immersive technology sector. In particular, there is a growing set of products and services that go beyond gaming, which is the primary use of the technology today, to include applications focusing on education, business, entertainment, and fitness. As these application areas mature, they will need supporting technologies, including additional apps, services, and peripherals. In addition, advances in generative AI offer new opportunities for creating content more easily for virtual spaces.

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?

Many of the early proponents of the metaverse have committed to a long-term vision of interoperability and do not want to see these platforms develop into walled gardens.[6] Indeed, the idea of the metaverse—a shared, immersive virtual space where people can interact online—as a successor to today's Internet depends on it being built using open and interoperable standards and protocols. However, while many companies will

pursue that vision, others may prefer to build closed ecosystems to address specific customer needs, such as privacy, security, safety, cost, or performance. Allowing competition between different models—both open and closed—will give consumers more options and allow businesses to innovate more quickly than forcing the industry to adhere to a single set of standards.

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?

Paid downloads are the primary revenue model for many leading apps on VR platforms, such as the Quest Store. For example, over half of the apps (52 percent) in Apple's App Store for the Vision Pro are paid downloads, compared to only 5 percent of mobile apps in the App Store.[7] Others earn money through subscriptions. As of March 2023, 40 titles in the Quest Store generated more than $10 million in revenue.[8] However, as the number of apps grows on these platforms, they may use alternative business models, including targeted online advertising, to provide free or low-cost apps. The relative number of apps on these platforms is still small, especially compared to the mobile app market, which numbers in the millions. In contrast, Meta announced that there were more than 500 apps available on the Quest Store in March 2023, and Apple announced in February 2024 that it had more than 600 apps available for its Vision Pro headset.[9]

Moreover, some metaverse platforms may enable an ecosystem of peer-to-peer transactions built on blockchain technology. For example, creators may buy and sell virtual land, objects, clothing, and more in these immersive 3D worlds. These transactions, especially if they are on the blockchain—a digital public ledger of transactions—could create new data streams that businesses may analyze or monetize. In addition, consumers may choose to use blockchain technology to directly monetize their own data, such as creating smart contracts that allow advertisers to access their data for a given price or enforce data usage policies when they provide access to their personal data.

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

Currently, the virtual world market is dynamic and fragmented; no company has sufficient market power to distort competition. Moreover, there is competition in virtual worlds from both Web 2 (e.g., user-generated content and social media) and Web 3 companies (e.g., blockchain and other decentralized services with new forms of digital content ownership)—in other words, a mix of incumbents and new players.

While predicting future competition in virtual worlds with certainty is impossible, potential antitrust issues—such as those on the physical and digital markets—may occur in certain circumstances just as they can in any market. For example, firms with market power might leverage their power in ancillary markets to obtain power in virtual world markets as well; however, their success in other markets does not at all guarantee their future success in immersive technologies, and leveraging strategies can not only fail for a variety of reasons but also lead to procompetitive outcomes. In particular, companies investing in next-generation virtual world technologies may engage in self-preferencing to bolster innovation and user experience, potentially leading to a more robust and competitive virtual world ecosystem in the long run. There are also pro-competitive aspects of limiting interoperability, as closed ecosystems might be able to better address specific customer needs than interoperable competitors. Although virtual worlds might become siloed, with users unable to move their digital assets or avatars between different platforms without interoperability, allowing competition between

different models—both open and closed—will often give consumers more options in practice and encourage businesses to invest in innovation.

9) Do you expect the emergence of new business models and technologies to trigger the need to adapt certain EU legal antitrust concepts? & 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 rise of decentralized services may seem to push the boundaries of traditional antitrust concepts. For example, identifying dominant undertakings—operating without a central entity and relying on distributed networks—may present difficult facts that make it harder to identify the undertakings with market power. In addition, in a decentralized system, decision-making and control might be spread across a network, resulting in difficulties and liability issues within the network. However, the emergence of new business models and technologies should not by itself trigger the need for new EU or other legal antitrust concepts. Consider the rise of the Internet. The Internet created a new environment for communication, information sharing, and commerce. It brought new technologies such as web browsers, search engines, email, and e-commerce platforms that emerged to facilitate online activities and serve users. Along the way, new business models emerged. Companies like Amazon, eBay, and Google adopted innovative business models like online retail marketplaces, auction platforms, and search advertising, which thrived in the new digital landscape. These models revolutionized traditional brick-and-mortar retail and advertising industries, communication, and the way of life in general—and up until recently, these could fit into the traditional frames of antitrust laws and enforcement. And, while the EU enforced its antitrust laws vigorously, it did not change its core competition law framework. As long as emerging business models and technologies can be evaluated within the existing legal framework, legislation should rest. The same is true here: The European Union and its member states have a well-structured legal and judicial system to answer interpretation questions and provide remedies. Antitrust enforcers and judges will develop expertise in the virtual worlds and better understand their technical aspects and economic dynamics to assess competition issues effectively.

GENERATIVE AI

1) 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

Data, compute, and talent are the three main components necessary to build, train, deploy, and distribute generative AI systems. Data is essential to train generative AI models.[10] AI models, like BERT, Claude, GPT, Llama, and Gemini, use a transformer-based architecture where increasing the amount of training data, especially high-quality data, results in improvements in performance.[11]

Compute refers to the computational resources, such as high-performance processors and specialized hardware, required to train and run AI models.[12] Training a generative AI model requires more computing power as the amount of training data and size of the model increases.[13] GPT 4, one of the most advanced AI models, required training that used 25,000 A100 chips for about 2,300 hours.[14] These chips are available for less than a dollar per hour, so the cost of training the model at that rate would have been under fifty million dollars.[15] This amount is a large sum for an individual, but not an entry barrier for a firm competing in this sector.

Talent refers to professionals who possess the requisite skills and knowledge to develop and deploy AI models. However, there is no commonly agreed-upon definition of what constitutes "AI expertise" or the "AI workforce," which means there is no common definition of a skills gap problem despite broad consensus that there is one. Indeed, existing literature on the AI labor market vastly disagrees on the pervasiveness, scale, and concentration of skill misalignments. There are many types of AI expertise one can include in a measure of the AI workforce, ranging from a top computer scientist who can lead an AI R&D team, to an entry-level engineer who is not an AI specialist but has sufficient skills to execute coding tasks.[16] There are also many different domains of expertise, including experts in hardware, software, and data.

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.

The generative AI market is still in its early stages, and as of now, there is no evidence of significant entry barriers. Concerns about data being an entry barrier in AI are speculative and unsubstantiated. Firms seeking to create generative AI models can use data from various sources, including publicly available data on the Internet, government and open-source datasets, datasets licensed from rightsholders, data from workers, and data shared by users. They also have the option to generate synthetic data to train their models.[17] Some firms, such as OpenAI, Anthropic, and Mistral AI, have succeeded in creating leading generative AI models despite not having access to the large corpus of user data held by social media companies such as Meta or X.com. Additionally, companies with internal data can leverage it to build specialized models tailored to specific tasks or fields, such as financial services or healthcare.

Similarly, compute resources required for training generative AI models have not proven to be an entry barrier. There are numerous players in the cloud server market that provide the necessary infrastructure for training and running AI models. For example, Anthropic used Google Cloud to train its Claude AI models.[18] In terms of chips, Nvidia's graphics processing units (GPUs) are popular, but face meaningful potential competition from firms like AMD and Intel.[19] Other firms are also investing in chip design and manufacturing, fostering competition in the market.[20] For example, Google has invested heavily in Tensor Processing Units (TPU), specialized chips designed to train and run AI models.

Talent, another essential input in building AI models, is not a barrier either. For example, Mistral AI, a French startup that makes open-source and closed AI models, has demonstrated that it is possible to build industry-leading models with a team of fewer than 50 employees.[21]

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?

Generative AI firms compete on various dimensions to differentiate themselves in the market. The main drivers of competition include performance, price, speed, interface, licenses, customization, and task specificity. In terms of pricing, many generative AI systems providers, such as OpenAI, Gemini, and Claude, offer chat interface access to their models at around $20 per month.[22] However, the prices for API access may vary between these providers.[23] Speed is another crucial factor, with models like GPT Turbo and Claude Instant focusing on delivering faster inferences to meet the demands of real-time applications.[24] Firms also

compete on the licensing structure. Meta's Llama model, along with Mistral's Mixtral-8x7B and Mistral 7B models, and the BLOOM model created by independent researchers, use an open-source license that allows users to use, reproduce, distribute, and modify the original model. This freedom allows developers to use and adapt the model to a diverse set of applications, including some of which the original model developers might not have accounted for. Other generative AI models, including GPT-3 from OpenAI and Claude from Anthropic, have built proprietary models. From a consumer's point of view, having different licensing models increases the options in the market. From the supply side, an open-source model maker does not bear the full cost of creating and sharing the models. For example, Mistral shared its models via a torrent file on a peer-to-peer file-sharing network. Hardware advancements are also driving competition in both the provision and distribution of models. As the AI industry matures, there is a growing demand for specialized AI systems. Companies like Bloomberg have recognized this need and have created its own models tailored to specific applications of AI in finance.[25]

Looking ahead, there will be increasing opportunities for AI systems to specialize in niche areas while also providing general capabilities. Successful players in the AI market will be those who can effectively balance these various dimensions of competition and deliver value to their customers through innovative solutions.

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.

The rapid development of generative AI systems has generated concerns from some regarding potential anticompetitive practices by large, vertically integrated firms that control the entire AI stack, from cloud infrastructure to applications, and may use tactics that stifle competition and hinder innovation, such as excluding downstream rivals. This could involve restricting access to essential cloud resources or copying and integrating features from competitors, which results in effectively squeezing them out of the market due to their own scale and reach. Additionally, these firms might prefer their own AI products and services within their ecosystem, further limiting market access for new entrants.

Enforcement should not be based on theoretical concerns but on specific evidence of anticompetitive behavior that harms consumers. Moreover, this behavior can also result in procompetitive benefits that outweigh any possible anticompetitive harms. Indeed, vertical integration often results in a number of procompetitive benefits relating to increased scale and scope that can drive innovation and consumer benefits. Concerns about speculative competitive harms should not outweigh real benefits to innovation and consumers. The competitive dynamics in the AI hardware and cloud markets suggest these concerns have not materialized. While firms like Google are heavily vertically integrated, Nvidia, Microsoft, and Amazon have partnered with multiple generative AI startups, such as OpenAI, Mistral, and Anthropic, as well as larger generative AI companies, such as Meta. In other words, competition between large firms at the hardware and cloud levels is facilitating, rather than stifling, competition at the model and applications level.

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?

Firms have various opportunities to monetize generative AI systems and components. On the components side, compute providers can monetize by renting compute resources through cloud platforms. Many of the

compute providers are engaged in model making as well, where they use up these resources themselves. These compute providers can either build the chips in-house or purchase them from chip manufacturers. Firms, such as news agencies and social media platforms, can monetize data they own or control, while firms can also create and sell synthetic data.

Some components are not always monetized. For example, firms may use open-source datasets, such as Pile, which have been instrumental in training generative AI models.[26] Some firms monetize model access via chat interfaces or APIs, including OpenAI with ChatGPT, Google with Gemini, and Anthropic with Claude. These firms charge for the use of these models through chatbots or charge per API call. Aggregators, like poe.com, provide access to multiple models for a single subscription.

In a market economy, each component will be compensated according to its marginal contribution. High returns on one component will attract investments and increase its availability, eventually driving down its return. Furthermore, in an innovative and rapidly evolving industry like AI, new use cases and monetization methods will continually emerge.

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 effectively compete with proprietary AI systems in the market. Many of the AI systems making significant technological advances are based on the publicly available "Attention is All You Need" paper from the Google DeepMind research team.[27] Recognizing the importance of open-source models, industry leaders like Meta and Google have released open-source AI models such as Llama and Gemma, respectively. In addition, open-source models like Mistral 7B, Vicuna, and Zephyr 7B have made remarkable progress and score well on many benchmarks.[28] Open-source generative AI models offer the advantage of being adaptable and modifiable by firms, enabling their use in a wide range of applications that model makers might not have initially anticipated. This flexibility is a major selling point for innovative downstream applications as well as for firms that create new models based on existing open-source ones.[29]

Open-source data sources allow new firms to enter the market with fewer resources, which stimulates procompetitive follow-on innovations. Talented individuals can also contribute to the knowledge base by participating in open-source projects. As a result, open-source plays a crucial role in ensuring competition between AI firms, helping outsiders enter the market, and contributing to the growth of the scientific research base and knowledge sharing. Indeed, the continuing success of open-source AI systems and components confirms their ability to compete effectively with proprietary alternatives.

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 see prior responses.

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?

Please see prior responses.

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.

Vertically integrated companies that provide multiple components along the generative AI value chain, including user-facing applications and plug-ins, do not necessarily enjoy an advantage over other companies. Each firm chooses its level of integration based on what it believes will be most profitable. For example, Meta has decided to build large language models (LLMs) and make them available via an open-source license. And while Meta has access to compute infrastructure, it does not provide cloud services or allow others to run its models on its servers. On the other hand, Amazon provides cloud services but it is not building LLMs. Google provides cloud services and has built LLMs that run on its compute resources. The presence of varying degrees of vertical integration among large tech companies suggests that each approach has its own tradeoffs and not all firms will adopt the same integration strategies.

Microsoft, for example, integrates a generative AI system (Copilot) with its operating system, web browser, and office productivity suite to enhance the user experience. However, this does not imply an inherent advantage over standalone AI systems like those developed by Mistral AI. Microsoft must work within specific constraints to ensure compatibility and usability within the Windows environment, which differs significantly from creating an open-source AI model like Mistral does.

Companies pursue vertical integration to achieve efficiency gains, which benefit consumers and competition, which can be essential to recoup fixed costs. For an AI firm entering the chip manufacturing market, high initial investments are required without any guarantee that their chips will outperform available alternatives. Moreover, even if the vertically integrated firm successfully manufactures superior chips, the competitive advantage may be short-lived if rivals can achieve greater efficiency gains or other innovations.

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?

Large companies, both in the tech industry and beyond, are investing in and acquiring smaller generative AI firms to integrate this technology into their existing offerings. AI has diverse applications in many different fields, and companies recognize the potential benefits it can bring to their products and services. For example, Google could use AI to summarize search results, while McDonald's could employ AI systems to optimize drive-thru operations.[30]

Tech companies have been particularly active in acquiring AI firms due to the greater synergy between their existing products and AI technologies. These acquisitions and partnerships provide smaller AI firms with access to more funding and resources, enabling them to scale and innovate faster. The possibility of a lucrative buyout also incentivizes venture capitalists and entrepreneurs to invest in new AI startups, fueling further growth and innovation in the sector.[31]

In the rapidly evolving LLMs market, incumbent tech firms are making significant investments and engaging in direct competition. Microsoft has invested in OpenAI, while Amazon has partnered with Anthropic. Alphabet has entered the fray with its Gemini models, and Meta has contributed to the development of Llama models.[32] This increased involvement from major players has intensified competition and accelerated

innovation in the LLM space. OpenAI's GPT-3 was a breakthrough made possible by funding from Microsoft. Anthropic later released its Claude models and increased the context window to two hundred thousand tokens to be a differentiator. To match that move, OpenAI released GPT-4 Turbo with a context window of 128,000 tokens.[33] Gemini models from Google have a token window of up to a million tokens.[34] These examples showcase the competition within the market for LLMs on a single dimension. Further, even as the models have gotten better the prices have stayed at $20 per month for the chat version.

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?

In lieu of legal adaptations, the EU should prioritize enforcing its existing competition laws in a way that strikes the balance between fostering innovation and combatting harmful anticompetitive behavior if it occurs.

The rise of generative AI is a new wave of Schumpeterian competition—a dynamic form of competition driven by innovation, creative destruction, and the constant flux of market leadership positions—that will result in tremendous benefits for consumers. The nascent and dynamic nature of the market, the growth of both open and proprietary AI models, and the potential benefits of procompetitive practices by leading companies (e.g., sharing anonymized data sets, open-source collaboration), all weigh heavily against new laws or regulations to address generative AI.

Laws are ultimately designed to serve people; they do not exist for their own sake. Therefore, policymakers should be vigilant in adapting the law when necessary to protect consumers and ensure a healthy and competitive market, but not before a necessity for this type of *ex-ante* regulation to address market failure arises.

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

Competition authorities should develop expertise in generative AI systems to effectively assess potential issues using existing frameworks. Traditional investigation methods—often focusing on tangible assets and market share—might require adjustments to handle the unique characteristics of this evolving landscape.

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