

11.03.2024

Responsible persons at BVDW

Jane Kuberzig, Manager Public Affairs, +49 30 2062186-23, kuberzig@bvdw.org

Katharina Jäger, Head of Innovation and Technology, +49 30 2062186 16, jaeger@bvdw.org

Call for Contributions

Competition in 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.**

The main components necessary to build, train, deploy, and distribute generative AI systems encompass data, algorithms, computing power, and talent. Each of these elements plays a crucial role in ensuring the functionality, efficiency, and ethical use of generative AI technology.

Data serves as the foundation for generative AI systems, fueling the learning process and providing the necessary information for the system to understand and generate complex outputs. The quality, diversity, and relevance of data are paramount, as they directly influence the accuracy and effectiveness of AI-generated outputs.

Algorithms define how generative AI systems learn and process data. These algorithms determine the behavior and capabilities of the AI system, shaping its ability to understand and generate outputs that meet specific criteria or objectives.

Computing power is essential for accelerating the training of generative AI systems, enabling rapid processing of vast amounts of data and complex computations required for training and inference tasks. High-performance computing resources facilitate efficient training and deployment of AI models, ensuring timely delivery of AI-generated outputs.

Talent drives innovation in the development and deployment of generative AI systems. Skilled professionals with expertise in AI development, machine learning, and related fields are essential for designing, implementing, and optimizing AI algorithms and systems.

In addition to these foundational components, further technical skills and resources are necessary to fine-tune generative AI systems while ensuring ethical and secure use. Quality and risk management processes help identify and mitigate potential issues or biases in AI-generated outputs, ensuring that the technology is used responsibly and ethically.

As users of generative AI effective prompt engineering is crucial to provide the AI system with the appropriate context for generating outputs, such as in customer service applications. Additionally, ensuring a secure environment, such as an encapsulated cloud environment with servers located in the EU, is essential to protect sensitive data and comply with regulatory requirements.

For distribution purposes, the interoperability of generative AI systems with receiving software is critical. Standardized APIs facilitate seamless integration and communication between different software systems, enabling efficient distribution and deployment of AI-generated outputs across various platforms and environments.

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.

Three categories of barriers can be identified: the technical barrier, the organisational barrier and the lack of acceptance in society. These challenges relate mainly to the initial setup and ongoing development of AI models.

The first barrier includes access to high-quality data and its availability or lack thereof. Interfaces and other standards are also needed so that the systems can be used in a variety of use cases. The technical barrier also includes access to sufficient large-scale computing power.

On the organisational side, the first issue is compliance costs, especially those potentially arising from the AI Act. Added to this are structures in companies that are not always designed for fast decision-making processes and the lack of understanding of a technology such as AI at the executive level. On the positive side, there are definitely skilled personnel in the field of AI in Europe. However, this personnel mainly comes from (fundamental) scientific research. Data protection and IT security also often can cause organisational issues. On the one hand, secure software and hardware components must be provided. On the other hand, a well-qualified data protection officer is needed to support the development of AI systems.

Finally, the acceptance of the entire technology in society, i.e. among users is of crucial importance for the further development of AI. Fear of a new technology must be countered rationally and with positive examples. Those who feel left behind by the technological development must also be taken on board. Above all, acceptance reduces organisational hurdles, as executives can assume investment security and developers can assume that their system will be implemented.

To foster a competitive and innovative environment, we must address these barriers, ensuring that startups and researchers have the resources they need to thrive.

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?

Key drivers in this competitive arena include innovation, access to diverse and extensive datasets – encompassing both open access and public data – and the ability to attract top talent. Access to a wide range of datasets enriches the training of AI models, enabling companies to produce more accurate and relevant content. Moreover, the ability to attract and retain top talent in AI development and related fields is crucial, as skilled professionals are essential for driving the development of cutting-edge AI solutions.

In the realm of media companies, the integration of AI systems is driven by several key factors. Primarily, the competitive landscape is shaped by the necessity to keep pace with the vast amounts of content being generated by competitors through AI. The rapid transformation in online journalism globally demands efficient content creation, with search engines grappling to effectively handle the influx of AI-generated material. Consequently, media companies find themselves compelled to adopt AI solutions to remain competitive, mirroring the practices of their industry peers.

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.

Several competition issues are likely to arise in the provision, distribution, or integration of generative AI systems and components, including AI models. These issues encompass data monopolies, high entry costs for computational resources, and proprietary technologies hindering interoperability. Data monopolies present a significant concern, potentially limiting access to essential datasets and creating barriers for new competitors. Furthermore, the considerable investment required for computational resources may discourage smaller players from entering the market, consolidating power among existing industry giants. Moreover, proprietary technologies that lack interoperability could restrict competition and innovation by locking customers into closed systems. Addressing these challenges necessitates the close monitoring of industry trends as well as the development of regulations that promote open standards and fair competition. By fostering an environment conducive to collaboration, data sharing, and interoperability, regulators can mitigate the adverse effects of data monopolies and proprietary technologies, thereby fostering a more competitive and innovative landscape in the realm of generative AI systems.

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?

Generative AI systems and components, including AI models, are likely to be monetized through various methods such as licensing, subscription services, and offering AI-powered products and solutions. The primary focus of monetization often revolves around specialized AI models tailored to solve specific industry problems. Consequently, the majority of business value stems from Business-to-Business (B2B) or Business-to-Business-to-Consumer (B2B2C) services provided by AI companies.

Currently, prevalent monetization strategies include pay-per-use models for accessing text analysis and generation services, as well as subscription-based models. This is particularly evident in the integration of Generative AI into standard office software under licensing models, wherein users subscribe to access AI-powered features.

The components capturing most of this monetization typically involve specialized AI models designed for industry-specific applications, as they offer substantial value to businesses seeking solutions tailored to their needs. However, it's crucial to ensure that these monetization strategies align with societal interests by encouraging innovation and enhancing accessibility to AI technologies. Thus, fostering an ecosystem where monetization benefits society through innovation and accessibility is paramount for the sustainable growth of generative AI systems.

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 undoubtedly play a pivotal role in democratizing access to technology, fostering innovation, and expediting development processes. While proprietary AI systems may initially lead in certain aspects owing to substantial investment, open-source projects can effectively compete by encouraging collaboration and innovation. The accessibility provided by open-source initiatives is particularly beneficial for individuals outside corporate environments who lack resources but possess talent and creativity. This accessibility accelerates knowledge formation and can ultimately lead to the emergence of even more innovative AI solutions.

However, it's important to acknowledge that the current landscape of open-source generative AI is not as democratized and standardized as proprietary alternatives. Numerous questions, including those related to licensing and disclosure obligations, remain unresolved. Despite this, supporting both open-source and proprietary models is vital for fostering a healthy ecosystem in the AI industry.

Open-source projects contribute significantly to leveling the playing field and empowering a broader community of developers and researchers. They facilitate collaborative efforts, allowing individuals from diverse backgrounds to contribute their expertise and insights. This collaborative nature often leads to the emergence of innovative solutions that may not have been possible within closed, proprietary environments.

Proprietary AI systems benefit from dedicated resources and expertise, enabling them to push the boundaries of technological advancements. They often provide polished, commercial-grade solutions backed by comprehensive support and maintenance services.

In conclusion, while proprietary AI generative systems may have certain advantages initially, open-source alternatives compete effectively by promoting collaboration, democratizing access to technology, and fostering innovation. Moving forward, addressing concerns related to standardization and licensing will be crucial for further democratizing and advancing open-source generative AI systems.

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?

Structured and organized data forms the cornerstone of a company's AI strategy. Often, companies attempt to formulate an AI strategy without first establishing a coherent and comprehensible data structure for their organization. Data serves as the lifeblood of AI systems and components, including AI models, with its volume, quality, and diversity playing crucial roles in determining the effectiveness of these systems.

The volume of data available to AI systems directly impacts their capacity to learn and make accurate predictions or generate outputs. Additionally, the quality of data is essential, as inaccuracies or inconsistencies can lead to flawed results. Furthermore, the diversity of data ensures that AI systems are capable of handling various scenarios and generating relevant outputs across different contexts.

Ensuring access to high-quality data while upholding privacy and ethical standards is paramount for the provision of generative AI systems and components. Achieving this balance necessitates a change in the regulatory approach by promoting innovation while safeguarding data protection and privacy rights. Therefore, it's crucial to develop frameworks and regulations that enable organizations to leverage data effectively for AI development while respecting ethical principles and ensuring data privacy and security.

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?

Interoperability plays a pivotal role in the provision of generative AI systems and components, including AI models, as it facilitates interaction between these systems. The more interoperability exists, the greater the potential for interaction among GenAI systems, leading to heightened competition.

Interoperability between AI systems and components fosters innovation by enabling seamless integration of technologies from different sources. This integration allows for the development of more comprehensive and versatile AI solutions that can address a wider range of user needs and preferences. Additionally, interoperability enhances competition by promoting a more level playing field, where various providers can compete based on the merits of their offerings rather than on proprietary lock-ins.

Conversely, a lack of interoperability can create silos within the AI ecosystem, restricting choice and flexibility for users. This siloed approach hampers collaboration and innovation, potentially stifling competition and limiting the development of comprehensive AI solutions.

Therefore, encouraging standards and frameworks that promote interoperability is essential for fostering a vibrant AI ecosystem. By promoting interoperability, regulators and industry stakeholders can enhance competition, spur innovation, and ultimately drive the advancement of generative AI systems and components.

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 are able to capitalize on efficiencies and drive innovation by controlling more aspects of the AI value chain. By offering a comprehensive suite of products and services, they can provide users with seamless experiences and innovative solutions that leverage various components of generative AI systems.

This advantage becomes particularly pronounced in the context of Multi-Agent systems that seamlessly communicate and operate with one another. Through this integration, users benefit from a cohesive experience, often described as "everything under one roof," resulting in heightened efficiency and speed.

However, this integration can present challenges to competition if it leads to gatekeeping or unfair advantages. Vertically integrated companies may potentially exploit their dominance in one area

of the AI value chain to unfairly disadvantage competitors or restrict access to essential components, thereby stifling competition and innovation.

To mitigate these risks, it is crucial to ensure a level playing field and an open market environment that encourages competition and innovation. By promoting fair competition and preventing anti-competitive behavior, policymakers can foster a healthy and dynamic ecosystem for generative AI systems and components.

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 invest in or acquire small providers of generative AI systems and components, including AI models, for several reasons. Firstly, such investments allow them to gain access to innovative technologies and talent that could enhance their own offerings and keep them ahead in the competitive landscape. By integrating these innovative technologies into their existing portfolio, large companies can strengthen their market position and expand their capabilities in generative AI.

Furthermore, investing in or acquiring small AI providers can also benefit the ecosystem by providing startups with the necessary resources to further develop their technologies and scale their operations. This injection of resources can accelerate the pace of innovation and drive progress within the industry.

However, there are concerns about the potential impact of these investments and acquisitions on competition. When large companies acquire small providers, there is a risk that it may stifle competition by consolidating power and reducing the number of independent players in the market. This concentration of power could potentially limit choice for consumers and hinder innovation by stifling competition.

To mitigate these concerns, it's important to ensure that such actions do not lead to anti-competitive behavior or hinder innovation. Alternative funding and subsidies for startups will be important to keep promoting innovation in Europe. One additional way to address the concerns is by encouraging alternative means of support for startups, such as providing computational resources instead of solely offering financial investments.

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 emergence of generative AI systems and components, including AI models, is likely to necessitate the adaptation of EU legal antitrust concepts to address new challenges in the digital age. These challenges include issues such as data monopolies, control over computational power, and algorithmic collusion, which may not have been adequately addressed by existing antitrust regulations.

Data monopolies, wherein a few dominant players control vast amounts of data, can hinder competition by limiting access to essential datasets necessary for training AI models effectively. Similarly, control over computational power can create barriers to entry for smaller competitors, consolidating power among existing industry giants.

Additionally, the emergence of algorithmic collusion, where AI systems collude to manipulate markets or fix prices, poses new challenges for antitrust enforcement. Traditional antitrust concepts may not be equipped to address these forms of collusion effectively.

Adapting EU legal antitrust rules and regulations to the digital age is essential to maintaining fair competition and fostering innovation in the generative AI industry. This may involve revising regulations to address issues such as data monopolies, ensuring fair access to computational resources, and developing mechanisms to detect and prevent algorithmic collusion.

By reviewing and updating antitrust regulations to address the unique challenges posed by generative AI systems and components, policymakers can help create a level playing field for competition, encourage innovation, and protect consumers' interests in the digital era.

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

The complexity and evolving nature of AI technologies necessitate that antitrust tools and practices evolve to effectively monitor and address potential anti-competitive behaviors in this domain.

To effectively investigate anti-competitive practices related to generative AI systems, EU antitrust authorities must develop expertise in AI technologies. This includes understanding how these systems operate, how they interact with data, and how they may potentially be used to engage in anti-competitive behaviors.

Furthermore, ethical considerations must be integrated into the adaptation of antitrust investigation tools and practices. This ensures that investigations are conducted in a manner that respects individuals' rights and values, and that potential regulatory actions are consistent with ethical principles.

Lastly, it's important that any adaptations to EU antitrust investigation tools and practices do not create barriers for thriving innovation in the generative AI sector. While it's essential to address potential anti-competitive behaviors, regulatory actions should be carefully balanced to encourage continued innovation and competition in the marketplace.