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European Commission

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Call for Contributions – Generative AI

Dear Sir or Madam

Responding to the European Commission's respective call, I herewith provide a contribution on the topic of generative AI (hereafter also simply: **"AI"**) and competition law.

- I am a professor for business, competition and intellectual property law at Zurich University, chair the University's Center for Competition and Intellectual Property Law (CIPCO), and am an Affiliated Research Fellow of the Max Planck Institute for Innovation and Competition. My contribution focuses, thus, on my main areas of expertise, i.e. competition, intellectual property and data law. It draws on CIPCO research projects and previous publications of mine.
- Furthermore, given the breadth and complexity of the topic, this contribution can only be selective and high-level. I am happy to provide further details and references in a next step, if helpful. The contribution addresses many of the questions listed in the Commission's call but it is not organized strictly along their sequence. Instead, references indicate the question(s) to which a given section mainly relates:

Content

1. Business Models and Competitive Situation (Questions 5, 9)

1.1. Three Main Business Model Examples

Three important (though not exclusive) business models in the nascent AI sector may be called the "AI Standalone", the "AI Ecosystem App" and the "AI Functionality" model. **AI Standalone** offers the use of a generative AI which is not deeply embedded in, and tied to, the use of an overarching digital ecosystem. Open AI's (publicly available) ChatGPT or Getty Images' AI picture generator present examples of AI Standalone offers as users can access and employ them regardless of whether they also use a particular browser or overarching digital ecosystem. Subscription fees or the sale of adds may allow to monetize AI Standalone offers.

AI Ecosystem Apps form a relatively distinct part of an overarching digital ecosystem. Frequently, they are intended for combined use with other apps/functionalities of the ecosystem. For instance, Microsoft's Copilot interacts with, inter alia, Edge, Bing, and the MS Office apps; Apple's MGIE interacts with iOS picture/photo apps; Google Orca interacts with ChromeOS. Monetization occurs as part of the ecosystem's overall monetization strategy, e.g. by (initially) limiting availability of the AI Ecosystem App to, more expensive, premium versions of an operating system.

AI Functionalities become an integral part of existing products/services/apps – which form, themselves, not necessarily part of a digital ecosystem – and are monetized together with them. For instance, BMW integrates Amazon Alexa AI functionalities into its car voice assistant and Nuance AI-empowers (some of) its Dragon speech-to-text apps.

Of course, these and further AI-related business models **blur and overlap** in many ways. A Getty AI picture generation app may, for instance, run locally on Windows or iOS users may download and utilize – as it were: across ecosystems – the MS Copilot, similar to the fashion they use MS Office or Google Workspace.

1.2. Evolving Competitive Landscape

The state of competition in the AI sector is a swiftly moving target, and other contributions will be in a better position to granularly describe the current landscape. Suffice it, hence, to point out four important (though not exclusive) groups of competition drivers: **chipmakers** compete to meet the strong demand (cf. also 2.) for high-performance chips. Nvidia seems currently in the lead but, since some tech giants (e.g. Apple) vertically integrate into the market for high-performance chips and

other companies seek to become less dependent on Nvidia as well (cf. for instance AMD-compatible Pytorch gradually replacing the Nvidia-Cuda-exclusive Tensorflow; Microsoft's strategic alliance with Intel), the company's position may come under increasing attack.

In spite of ChatGPT's prominence and its, arguably, strong market position, a multitude of (M)LLM-based **AI system providers** compete vigorously against each other, but also against the AI solutions (especially AI Ecosystem Apps and AI Functionalities) offered by large digital ecosystem hosts ("**Ecosystem Hosts**", especially the GAFAMs/MAIApAMs[1]). Tendencies typical for maturing technology/market sectors, such as niche-seeking (e.g. Fobizz for educational use, Scite.AI for correct academic references) or waves of market concentration, can be expected here as well. Given that it takes vast resources (computation power, expert staff, data pools, money, etc.) to successfully develop, train, market, and monetize an AI system[2] and that increasing sophistication of the systems – e.g. multimodality – may take an even heavier toll on resources, it seems doubtful whether concentration tendencies will be countervailed by continuous market entry. From a competition law/econ perspective, research projects should engage in watching market fluctuations to flag a need for competition law enforcement intervention early on.

Providers of incumbent products/services will continue to compete in their respective markets, with their ability to include AI Functionalities gaining relevance as a factor for market success.

For **Ecosystem Hosts (GAFAMs/MAIApAMs)**, this trend may create new market (re-)entry opportunities, e.g. regarding voice assistants, autonomous vehicles ("AIs on wheels"), computer hardware, other IoT products, or payment services. Together with these entry opportunities, the above perusal of competitor categories shows the Ecosystem Hosts to partake in many of the competitive races triggered by AI getting to the markets (cf. also 2.). This includes, as another example, the race for clients which outsource AI-driven activities to an Ecosystem Host and, thus, create a particularly close relationship with – and potential dependency on – said Host. The recent cloud- and AI-services outsourcing by Vodafone to Microsoft exemplifies the point. The shape and speed of competition between Ecosystem Hosts will be a major factor in the future of AI markets. Arguably, the Microsoft-OpenAI-alliance leads the pack in certain areas. Counter-attacks in some of them are at an early stage and time will tell about the success of projects such as Alphabet's AI-empowered office suite, or the Github/Copilot-style software generation tools offered by Alphabet (in cooperation with Replit), Amazon (Code Whisperer), and Apple (Xcode). Certain areas experience business activity only by some of the Ecosystem Host(s). For instance, Amazon's AWS offers AI systems for the individualized training and use of business but not of end customers; Meta and Alphabet prominently announced AI tools supporting their advertising business customers; Microsoft and Apple market AI-based refinement software for customer pictures/videos.

[1] Meta, Alphabet, Apple, Amazon and Microsoft.

[2] Even Microsoft, for instance, reportedly incurs/incurred losses on its Github/Copilot subscriptions.

2. Factors for Market Success – Barriers to Entry (Questions 2, 3, 7, 8)

Computing power, and especially **high-performance chips**, constitute an important success factor in, and lack of access to them accordingly a barrier for entry to, the AI market sector. Current scarcity may restrain competition especially by players not in a position to manufacture their own chips, but the extent and permanence of this problem seems uncertain given that Nvidia competitors (e.g. AMD, Intel) recently presented promising developments. At least temporarily, however, regional differences in chip availability may also influence competition between national/regional economies.

The crucial role of **Data** for digital markets need not be re-explained here. AI systems train on large data portfolios the content of which impacts the system's abilities. Large language models (LLMs) trained on descriptive internet texts, for instance, display difficulties to give operational problem-solving advice, and text-image multimodal LLMs (MLLMs) require exposure to picture collections. Hence, even for the general, non-user-specific training of AI systems picking **just any data portfolio won't do** and control over a portfolio with a specific, rare content may yield a competitive advantage even over market players that have access to large data volumes. Success on markets for the use of **general-purpose AIs** (as Meta has announced to focus on) may depend on a simultaneous access to manyfold data portfolios which smaller players may not easily gain. Such markets could, in consequence, be (even) more **prone to size effects** than markets for more specialized AI systems.

As a second step after the training on a non-user-specific data portfolio**, individualized training/adaptation** will decide upon the success of a range of AI-related business models. Access to a user's datasets (e.g. contracts, slide presentations, letters and memos, calculation spreadsheets and annual reports, pictures and videos) allows the AI to provide highly relevant search and analysis results. From such datasets it can learn context, needs and preferences for its generation of new content. Interaction with the user – for instance through edits made by human employees to AI-generated drafts – further trains the system towards generating output that caters, in content and style, to the user's demand. This **individualization step** may well be **easier for market players with whom users share individual content anyway**. For instance, social networks tend to have access to voluminous non-commercial data of their user base, and the same goes for providers of business software tools (cloud services, productivity software suits, CRM systems, etc.) regarding commercial data. Once a user has engaged with a particular market player by sharing content and commencing an AI individualization journey, **path dependencies may generate lock-in effects**. Confidentiality and data security obligations towards stakeholders (business customers who share business secrets with the user, employees and their personal data, etc.) may, for instance, hamper multi-homing, i.e. the sharing of data subject to such confidentiality/security obligations with several AI system providers. Repeating the individualization process with another AI system may be cumbersome and unattractive to users. Where several users (e.g. companies in a R&D cooperation) employ the same AI system which individualizes its output on their joint data, they could lose network effects if they fail to manage a coordinated switch to another system.

This last example shows that **network effects** can be a success factor or barrier to entry/expansion in the AI sector as well, even though they may not result as strongly from the use, as such, of AI systems as from, e.g., the platform structure of a market.

A more comprehensive account could describe **further success factors/barriers**, such as various levels of **vertical integration** (chip production, AI development and training, cloud services and other AI infrastructure, business or end customer products/services). The factors listed here suffice, however, to indicate that AI market characteristics may favor Ecosystem Hosts with their wealth of financial and non-monetary resources, partial vertical integration, strong base of users and strategic business partners (chipmakers, outsourcing customers, providers of complementary apps, etc.), access to general and user-specific data, and existing advantages from direct and indirect network effects. In the light of how well AI business models and an overall ecosystem business structure dovetail, announcements for concepts like Deutsche Telekom's "app-less smartphone" do not come as a surprise since such concepts aim, in essence, at the particularly tight integration of controller-operated and third-party apps into an ecosystem that interacts as a one stop shop interface with the user.

3. Entrenchment for Digital Ecosystems? – The Microsoft Copilot Example (Questions 2, 3, 4)

The more detailed analysis of Microsoft's Copilot business model may help to exemplify some of the points made heretofore and to identify potential theories of harm necessitating a competition law response.

3.1. The Copilot

Microsoft is not only a main investor but also a licensee of OpenAI. In particular, Microsoft integrates the ChatGPT technology into its "Copilot", a software that shall provide personalized assistance as part of various Microsoft applications, drawing also on data a user shared across the Microsoft ecosystem. In Microsoft Word, for instance, the Copilot could generate drafts or adapt documents to a user's personal style. Interacting with Bing and Edge, the software aims at more interactive, chat-based searches, results that summarize content from various websites into a single, comprehensive answer, actions following up on the search results (e.g. provision and comparative display of complementary content), and website-specific content generation (e.g. posts in LinkedIn style).

3.2. Potential Theories of Harm

While the innovative and efficiency potential of this new tool is evident, it also engenders concerns over negative effects on competition, for instance:

- Microsoft may try to leverage its (very) strong position in several software markets into an emerging market for "AI Content Generation Tools" – viz. the big data-based (AI-)generation of (individualized) digital content – by bundling the Copilot with incumbent blockbuster software.
- A swift and sweeping commitment of Microsoft's installed user base to the Copilot as their AI Content Generation Tool may hamper innovation competition and technical development. Whether concerns could also arise over deliberate limitations in the technical development

of the Copilot itself, including in its interaction with complementary innovations, will depend on Microsoft's R&D strategy and readiness to permit technical interaction with the Copilot, for instance by providing appropriate API information.

- The Copilot may be highly efficient in gauging characteristics of individual customers and individualizing the transaction conditions offered to them accordingly (e.g. personalized pricing). Copilot, potentially embedded into major parts of a customer's workplace, and – for instance through browse and search software – his/her digital private consumption processes could be a powerful instrument for market strategies along these lines.
- More generally, Copilot has the potential to weave Microsoft applications even more closely into a digital ecosystem. This can work towards increased user lock-in due to path dependencies and network effects, e.g., where third-party services are being provided to a Microsoft business customer or where teams from different companies cooperate in their use of Copilot. Copilot's ability to learn from the data, prompts and reactions of Microsoft's very large user base may create an information and performance asymmetry discouraging users from switching to less performant alternatives.

4. Competition Law Challenges Regarding (Mainly) Unilateral Conduct (Questions 2, 4, 8, 11)

4.1. Potential Threats to Competition

Together with an enormous beneficial potential, the market roll-out of AI business models also generates risks to competition. Among them, the present contribution would like to highlight the following issues for scrutiny and potential reaction.

1.1.1. Contestability and Asset Access

As described above, it takes (1) a large, high-quality, task-specific data portfolio, as well as many further resources to bring a competitive AI system to market. Amidst many alternatives in the early-stage AI markets, (2) presence and visibility in main sales channels (e.g. app stores) seems key for the sustained profitability of AI-based products/services. (3) Only an established, cooperative, content-sharing customer base may permit their individualization and continuous training progress at a level sufficient to satisfy (evolving) customer demand (on interoperability cf. below).

Conceivably, these conditions for large, beyond-niche market success converge in such a limited number of companies (e.g. Ecosystem Hosts) as to engender insufficient competition. In such a case, competition law[3] enforcement may have – subject to further requirements (essentiality, lack of reasonable duplicability, balancing, cf. below 4.3) – to ensure that (potential) additional competitors receive access to assets (in a broad sense) crucial for contesting the incumbents' market position. As to (1) above, general research and an assessment of the individual case would then have to show whether input resources (especially training data) or the trained AI system itself are the appropriate

[3] For brevity's sake, the term „competition law" in the present contribution usually encompasses the DMA. "General competition law" means competition law (e.g. Art. 101, 102 TFEU) except for the DMA.

access asset. Even though the parametrization of a trained AI model can be communicated and replicated, econ/IT research will have to further evaluate how such a manner of access compares to input resource access. As to (2) above, access to app stores, non-discriminatory search and ranking treatment of competitor products/services, and similar issues are meanwhile familiar to digital competition law. It does not seem evident that AI functionalities of the affected products/services necessitate a fundamentally distinct approach to them. (3) above, however, may prove intricate. Neither should an incumbent force its users to switch or multi-home in favor of a competitor nor may it – usually and absent user consent – share with the competitor user-specific content or an AI system version trained on it. Access granting obligations on the incumbent may, therefore, turn out to be a blunt sword at the individualized performance level, increasing the importance of interoperability and switching/multi-homing opportunities which could incentivize users to engage in alternative individualization journeys.

4.1.1. Contestability and Switching/Multi-homing

Even a competing offer that is – possibly with the help of mandatory asset access (cv. 4.2) – objectively adequate cannot successfully assail an incumbent unless users actually switch or multi-home in favor of it. For the digital sector, competition law rightfully puts a focus on removing barriers to switching and multi-homing already. If anything, this focus seems even more germane to AI markets because, as described above, some of their traits may increasingly lock users into digital ecosystems. In fact, user switching or multi-homing may, as it permits the individualization of competing AI products/services in the first place, be a contestability prerequisite.

4.1.2. Contestability and Interoperability

Interoperability can facilitate switching or multi-homing, for instance where it allows for the gradual migration of data and activities to a new provider of AI products/services or for the accessibility of content, contacts, settings, and other data across AI-empowered digital hosts. Even where users stick with a single main host (e.g. Windows as desktop operating system, Facebook as social media platform, iOS for mobile communications), interoperable products/services have a chance to compete within the host's ecosystem, both against the host and against other interoperable products/services. In an AI context, interoperability with the respective AI system itself matters, not only with (other parts of) a digital ecosystem or digital product. APIs to a stand-alone AI system or the AI-assistant in an ecosystem/product are key in this respect, as evidenced, for example, by programmers' strong demand, and willingness to pay, for the ChatGPT API or by financial services providers rushing to prominently integrate with the MS Copilot. Competition law will, therefore, have to ensure that powerful AI system/product owners handle their API structure in a pro-competitive (non-discriminatory access, provision of information necessary for effectively using the API, commercially reasonable pricing, etc.) manner.

4.1.3.Leveraging

Already today, factors like the digital infrastructure (e.g. mobile internet connectivity) underlying large market sectors, platform and/or ecosystem market structures, or sophisticated algorithmic software providing the performance which customers value highest in a given product/service offer strong digital players ample opportunities to enter adjacent markets and possibly transfer their market power into them. Tech companies marketing cars in a "smartphone on wheels" approach and employing traditional car manufacturers as their workbench, or e-commerce platforms handling payments, shipping, and customer relations management for their users, are examples of this conglomeration trend. Where – as it were – AI becomes the brain for which hardware or other product/service features are mere executing accessories or where AI assistants inseparably combine with the products/services they support, those who control the AI seem – if they so desire – in a good position to not only sell/license it as an input but to also start offering the product/service as a whole. Again, Ecosystem Hosts may profit from the additional advantage of an established, (partly) locked-in user base that they can more easily convince to become customers of their new products/services as well. Leveraging theories of harm to competition may, therefore, loom large for the AI sector and require new conduct rules beyond classics like the tying/bundling prohibition.

4.1.4.Granular Targeting

Increasingly sophisticated, though maybe not "artificially intelligent", algorithmic software has already provoked initial reflections on competitive harm resulting from its aptitude to better tailor transaction conditions (in a broad sense) to a given transaction partner. Examples may be more selective, and hence less costly, predatory pricing campaigns or the optimized exploitation of a customer's individual willingness to pay, possibly cultivated by targeted advertising. Market entry of AI systems, as the next step on this technology path, may aggravate such concerns and, for instance, require a firmer stance of competition law on personalized pricing. For one thing, AI assistants operating across large parts of a customer's digital activities tend to profile the customer more effectively than distinct algorithms he/she uses for searching, pricing, paying etc. Furthermore, the interactive capacities of such assistants ("buddy AI") may facilitate inducing demands or preferences a customer might not otherwise develop.

4.1.5. Power on Infrastructure Markets

At present, high-performance computer chips stand out as both a crucial and a scarce component in the hardware infrastructure for AI business models (cf. above 1.2, 2.). Other, less conspicuous components may possess or develop such a status as well, though.

Abuse of power in chip markets has elicited EU competition law enforcement before and the Commission must keep an eye on the production and distribution of chips suitable for AI applications. Practices, theories of harm, and applicable competition law rules may prove, at this hardware infrastructure level, not to be so genuinely particular to the AI context and rather relate to settings known from other areas. This is not to say, of course, that AI market characteristics will not matter.

For instance, competing products and steps (e.g. by Ecosystem Hosts) to engage in the production of AI-optimized chips may, so far, not provide to many chip customers an equivalent alternative to Nvidia chips. According to the General Court's *Qualcomm* ruling, this could impact the assessment of customer retention measures by Nvidia, if and because the customers would have sourced from the company anyway.

4.2. AI-related Conduct and the DMA

4.2.1. Partial Aptitude

A full analysis of the extent to which the DMA can check problematic Gatekeeper conduct in the AI sector is beyond this contribution. In some respects, the Act will certainly be very helpful, not least because certain Ecosystem Hosts qualify as Gatekeepers. Where, for instance, a Gatekeeper, pursuing an AI Functionality business model (cf. 1.1), engages in self-preferencing of its own, AI-empowered search app (Art. 2(2)(b) DMA) or other core platform service ("**CPS**"), enforcement can rely on Art. 6(5) DMA and possibly – depending on the nature of the self-preferencing – further DMA conduct obligations.

4.2.2. Partial Strain

In other respects, however, the DMA copes less evidently with AI technology and practices, which hit the market only after the Act had been conceptualized and passed. Again, the Microsoft Copilot provides a helpful example.

Microsoft has been designated as a DMA Gatekeeper, with LinkedIn and the Windows PC operating system as its current Core Platform Services. Unless one considers the Copilot to be an integral part of Windows,[4] the tool would equally have to be qualified as a CPS to become a primary subject of the DMA conduct rules. The CPS category of "virtual assistants" (Art. 2(2)(h) DMA) arguably constitutes the best, but not an evident fit. Its applicability hinges mainly on whether the Copilot can be said to provide, upon request, access to "other services" than itself. The tool differs from the applications which the DMA authors had in mind as virtual assistants, such as Amazon's Alexa or Apple's Siri. On the other hand, one can argue that the Copilot interacts with Microsoft applications (Word, Teams, Excel, etc.) that are distinct and already existed before it was even programmed. A broad reading of the virtual assistant category would enable the DMA to immediately cover some forms of generative AI applications instead of having to remain – until potential amendments – passive towards one of today's major technological developments.

Assuming the Copilot to be a "virtual assistant", Microsoft's installed user base and pertinent turnover are almost certain to establish the quantitative criteria for a Gatekeeper status regarding this

[4] This position may be easier to take as Microsoft introduces a Copilot specifically for Windows. Such a Copilot offshoot may compare to the search or Cortana functions which already help users to interact with Windows. The question would remain, however, whether a Windows Copilot offshoot turns the Copilot as a whole into part of Microsoft's operating system, including the Copilots for MS Office Apps, Bing, etc., or whether one would have to distinguish between the CPS nature of various Copilots.

CPS. In view of its characteristics, market, and competition implications described heretofore, the Copilot would arguably also fulfil the qualitative criteria under Art. 3(1) DMA. Very recently, the Commission has concluded that this is not the case for Bing and Edge. This does, however, not preclude a different finding for the Copilot which operates across these and other MS apps, and even Bing and Edge may deserve a reassessment depending on the market impact of their combination with the Copilot.

Even if applicable, the conduct obligations in Art. 5, 6 DMA may not be able to comprehensively mitigate the Copilot's anti-competitive potential. For instance, while Art. 5(8) DMA prohibits the tying/bundling of a CPS with another CPS, it cannot fight the fettering of a CPS (Copilot) to a non-CPS (e.g. MS Office apps), including software provided with a CPS. Furthermore, it seems unclear whether the provision covers technical tying strategies, whereby two CPSs (e.g. Copilot and LinkedIn) are technically integrated into a combined service.

To give another example: assuming that the Copilot performs, at least if used in Bing and Edge, search functionalities, Art. 6(11) DMA grants, in principle, FRAND access for other search engine providers to "ranking, query, click and view data in relation to free and paid search generated by [Copilot] end users". Other market players, for example office productivity software providers, can, however, not rely on this access mechanism. Nor extends Art. 6(11) DMA to data representing the Copilot training status, and which would enable competitors to tweak their AI assistants without having to replicate the ongoing, "on the job" training of the Copilot based on users' queries, clicks and views.

4.2.3. Adaptation Measures

To which extent can the DMA be adapted to AI challenges? Given, on one hand, the legal uncertainty whether a broad reading of the "virtual assistant" category will prevail and, on the other hand, the market and competition relevance of the Copilot and other AI assistants, the Commission should open a market investigation with a view to an extended list of CPSs (Art. 19(1), (3)(a) DMA) that clearly covers such assistants.

A market investigation should also assess the need for delegated acts under Art. 12 DMA, for instance extending access rights to further groups of market participants (Art. 12(2)(b) DMA) and training status data (Art. 12(2)(e) DMA), including real-time parameter updates (Art. 12(2)(f) DMA), or targeting the interaction of the Copilot with non-CPS software (Art. 12(2)(d), (g) DMA). Prior to adopting such delegated acts, the Commission would have to ascertain their compliance with Art. 12(5) DMA. In this respect, practices sketched heretofore as harmful to competition may well limit contestability by impeding competitors' market entry or expansion, with negative effects on innovation and user choice (Art. 12(5)(a)(i) DMA). The training data or training status of an AI system may – but does not necessarily – constitute a key input in the sense of Art. 12(5)(a)(ii) DMA. Exploitative transaction conditions imposed by Gatekeepers on their business partners – e.g. providers of AI Functionality apps or services that interact with the AI system – may also qualify as imbalanced and unfair (Art. 12(5)(b) DMA).

Novelty of the DMA cumulates with novel AI technologies and business models to create much uncharted terrain for both enforcers and Gatekeepers. They should, therefore, make early use of the regulatory dialogue mechanism (Art. 8(2), (3) DMA) in order to collaborate towards an effective and no more than reasonably burdensome application of the Act to the AI sector.

At the same time, given how swift AI markets are moving at the moment and how vulnerable digital markets have proven to tipping, the Commission should regularly review the need to adopt interim measure acts (Art. 24 DMA) that provisionally stop dangerous practices until their impacts can be more fully assessed. Technical or factual closure of a Gatekeeper's digital ecosystem to competing AI providers – e.g. by down-ranking out of users' sight – could be such a scenario.

4.3. AI Systems in the Light of General Competition Law's Access Rules

This contribution cannot possibly discuss the interaction between AI-related market activities and the entirety of general competition law's rules on abuse. It focuses, therefore, on a single point, namely a possible, competition law-based obligation to grant access to an AI system. As the previous section has shown, the DMA does not obviate the need for such an access obligation, especially because the Regulation cannot oblige companies other than Gatekeepers and because it is – in its current form – limited to CPSs, to certain types of data, and to certain types of entitled data recipients.

General competition law offers greater flexibility in this regard, with its essential facilities doctrine (EFD) as an obvious candidate for application. It should, by now, be accepted common ground that at least raw data constitutes an access asset within the purview of the EFD – be it in its traditional form, as developed in brick-and-mortar cases, or in the form of a more generic access concept that covers, in particular, also intellectual property and other intangibles. Some Member States, such as Germany, have even extended their statutory EFD rules to explicitly cover data. Access to refined training (meta-)data and, in particular, to the training status of an AI system is, however, novel ground. Interdisciplinary research will have to work out how to exactly determine the asset to be accessed in such cases, and how to realize the access. However, the discourse on transfer learning of algorithmic systems indicates that this is work worth undertaking. Assuming technical feasibility, this contribution contends that the EFD should be applicable to an AI training status as there seems not to be a fundamental difference between this and other immaterial assets which would justify per-se non-applicability.

This is not to say that the requirements of the essential facilities doctrine (in a broad sense) will be fulfilled regarding a given AI training status. On the contrary, competition law is rightfully cautious to subject highly refined data to an access obligation, and data embodying an AI training status certainly qualifies as highly refined. Before granting it, competition law would, hence, have to carefully assess whether access is truly indispensable or whether, for instance, raw training data would reasonably permit the development of AI alternatives that are – also in the individualization dimension – sufficiently competitive.

Market structure and the intellectual property rights (IPR) dimension add to the application intricacies. At least the traditional EFD requires the facility in question to be essential for competing on an

up- or downstream market distinct from the market in which the facility itself operates. This could exclude access rights in favor of horizontally competing AI system providers. A cautious application of refusal to deal rules may fill this gap, while respecting the principle that abetting its competitors is a standard obligation not even for a dominant company.

Furthermore, the code expression of AI systems usually enjoys copyright protection, data embodying the system parameters likely qualify as trade secrets, AI applications may lend themselves to patenting, and further IPRs may attach to an AI system setting (e.g. to training data). Case law grants – summarily speaking – access to IPR-protected assets only in "exceptional circumstances", for instance to generate competition and new or improved products on a downstream market (*Magill, IMS Health, Microsoft, Contact Software*), or because the FRAND-encumbered patents at issue read on a technical standard (*Huawei/ZTE*). In a somewhat formalistic sense, a competing AI (Functionality) would probably have "new" traits as two non-deterministic AI systems will not operate in exactly the same manner, at least after a certain operational or individualization phase. The case for IPR use rights will be stronger where, beyond this form of "novelty", competing AI Functionality products/services promise to materially surpass the IPR holder's performance. Whether certain IPR-protected AI systems acquire – for instance because they serve as the "brain" of an entire digital ecosystem – a standard- or gatekeeper technology-like status justifying mandatory access remains to be seen.

5. AI and (Algorithmic) Collusion

The role algorithmic software can play in supporting or even concocting anti-competitive agreements or concerted practices has been researched and discussed rather intensely.[5] While the market advent of AI does certainly not reduce the importance of this topic, we should critically reflect on the extent to which AI really alters the picture. This contribution submits three remarks for this reflection.

First, today's most prominent generative AI tools are not primarily directed towards collusive interaction. Software that provides answers to a non-commercial online search prompt or generates images in a certain style cannot be equated with a pricing algorithm. As one consequence of this insight, providing to several customers an AI of that sort, and which was trained on a single pool of data (in part) not publicly, easily available should not routinely raise hub and spoke concerns of the sort a pricing algorithm would raise in a parallel setting.

Second, this assessment changes where business users prompt AI responses regarding competition parameters – for instance optimal pricing suggestions for sellers on a digital marketplace – and these are based on commercially sensitive information, be it because such information served as training data or because the AI accessed them in generating a specific response. In such cases, the parallel interaction with the AI can result in a reduction of uncertainty over the respective competitors' course of action and an alignment of said course which attenuates competition. Especially providers

[5] For an overview of the state of discourse, see Picht/Leitz, Algorithms and Competition Law: Status and Challenges (2/2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4716705, ECLR 2024 (forthcoming).

of AI systems that train and individualize on the data of specific users must, hence, be quite cautious when they cross-market such individualized system versions to other commercial users. To avoid stumbling into a hub and spoke collusion, business users should contractually impose corresponding obligations on their AI providers.

Third, AI will become a functionality also of tools already determining, or aiding in the setting of, competition parameters (prices, offered quantities, etc.). In a way, business algorithms reach their next level of sophistication. While claims that such algorithms were a complete black box to their users or that they took an (anti-competitive) action truly and completely on their own proved hitherto often hollow, at least some neural network AIs are, indeed, non-deterministic. With their increasing complexity and prowess, predictability of their output will further decrease. Strict competition law liability for collusive, or otherwise anti-competitive output results (including actions taken by the system) may overburden especially smaller players (e.g. MSMEs) and deter them from using AI systems, even though such use keeps them abreast of competition and contributes to overall dynamic efficiency. Authorities should, therefore, together with stakeholders and competition law and informatics scholars, evaluate the definition of conduct principles compliance with which could secure, in principle, a safe harbour at least against fines.

6. Conclusion – Further Topics (Touching Upon Questions 10-12)

There would be many further topics which this contribution can, for time and space constraints, not discuss. Among them are:

- merger control and the need to be watchful of so-called “killer acquisitions”. Such acquisitions aim, prototypically, at removing (potential) competitive pressure by purchasing small/start-up pioneer companies and shutting down their activities or integrating them into the buyer’s product/service portfolio. Digital markets have generated acquisitions to which many observers attach the “killer” label and there seems to be no good reason why AI markets should not experience them as well. In fact, (i) the early, partly unconsolidated stage of the sector, (ii) the, so far, steady influx of new technologies and players, and (iii) – at the same time – the presence of large digital incumbents (such as the Gatekeepers) apparently pursuing an ecosystem augmentation strategy likely abet such mergers. A currently prominent characteristic of AI markets, and one that competition authorities should keep in view, are close cooperations between Ecosystem Hosts and smaller technology leaders which do, however, not result in a complete takeover of the smaller partner. Microsoft’s alliances with OpenAI and, more recently, with Mistral exemplify the phenomenon to which reputational worries[6] and the goal to avoid killer acquisition-focused enforcement may contribute. Although the effects of license contracts – typically a core element of such cooperations – are

[6] Certain AI companies, e.g. OpenAI or Mistral, boasted a common good-orientation not primarily going after profit maximization. Mistral even pursued an open-source approach. Already their cooperations with Microsoft are provoking harsh criticism and – provocatively speaking – a “gobbling up of the good guys” may have been even harder to sell to users and authorities.

not automatically tantamount to those of a takeover, such contracts can yield the licensee strong influence on the licensor, especially when combined with monetary investments into the licensor's business. Arrangements like a privileged status of the licensee – at least regarding (joint) follow-on improvements of the licensed technology – can withdraw the licensor's top-level technology from easy availability to other market players[7] and turn it into a competitive edge for the licensee/investor. Since the AI activities of such cooperations' "targets" will constitute (Core Platform) "services in the digital sector" or at least "enable the collection of data", Art. 14(1) DMA brings them onto the Commission's screen as long as the cooperation constitutes a "concentration" (Art. 3 Reg. 139/2004) and its larger partner is a Gatekeeper. Novel generations of AI technology – which incumbent cooperation partners will want to license right out of the R&D pipeline – do not necessarily generate immediate turnover while their individualization upon licensing may swiftly yield a competitive edge that competitors licensing the un-individualized technology at a later stage find hard to draw level with. This invites reflection on whether para. (24) of the Commission's Consolidated Jurisdictional Notice on the control of concentrations and the enforcement practice guided by it require an adaptation, or at least an interpretation adapted to AI cooperation settings. Edge technology licensing, outsourcing, ecosystem augmentation, leveraging, and other cooperation effects, as partly described in this contribution, figure into the analysis of whether a cooperation "threatens to significantly affect competition" in the sense of Art. 22(1) Merger Regulation;

- the interaction between competition law rules and other pertinent rulebooks, such as the GDPR or the AI Act. This includes appropriate interaction between the respective enforcement authorities. The framework sketched by the CJEU in its recent *Facebook* decision and based on "the duty of sincere cooperation enshrined in Art. 4(3) TEU" provides – albeit only partial – guidance in this respect;
- a synoptic, though thorough evaluation of whether the AI market advent necessitates fundamental changes to EU competition law. As the above remarks may indicate, the present author does not currently perceive such a need. This should not downplay the numerous, partly urgent adaptations advisable to empower competition law's handling of AI-related risks to competition. However, digital sector particularities have already, and quite recently, induced far-reaching amendments to competition law, including the DMA regulation. Some of them promise pro-competitive effects for AI settings as well. Proportionality and resource constraints of competition law enforcement, the inability to exactly predict the AI sector's trajectory, and the protection of its dynamic efficiency suggest, amongst other considerations, to first implement clearly perceivable AI-adaptation steps and gather experiences with

[7] Even though the present author cannot ascertain whether there is any connection between Mistral's apparent (partial) abandonment of its open source approach and the cooperation with Microsoft, the possibility bears mentioning that the bargaining power of a licensee interested in the exclusive, or at least privileged, exploitation of AI technology deflects the licensor from an open source to a more proprietary path (cf. Question 6).

the body of digital competition law rules, before hastening on to more ambitious (legislative) projects.

The final note of this contribution shall be a counterpoint. It is important to identify – as this contribution has selectively tried to do – AI-related risks to competition which require further research and, if corroborated, competition law policing. First and foremost, however, AI constitutes an innovation leap that promises strong benefits for economy and society. Lawmakers and administrative authorities cannot predict the future and are rarely wiser than markets, especially when it comes to nascent technology and market sectors. European competition law and enforcement should, therefore, remain cautious in its intervention and help to promote, rather than impede AI-related dynamic efficiency.