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EGDF response on the competition in Virtual Worlds and Generative AI

Organisation information

Registered name: European Games Developer Federation (EGDF)

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Address of the undertaking: European Games Developer Federation Ekonomisk Förening (EGDF) c/o DATASPELSBRANSCHEN The Park Södra, Magnus Ladulåsgatan 3

Name: Jari-Pekka Kaleva

Position: Managing Director

E-mail address: Jari-Pekka.Kaleva@egdf.eu

Telephone number: (+358) 407163640

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Virtual Worlds

In general

The game industry has decades of experience in building virtual worlds. One of the first Western executions of actual digital virtual worlds was implemented in 2000 by Finnish Sulake, who launched Habbo Hotel. Years later, in 2003, Second Life was released and gave lots of hope for the future of social virtual worlds. Since then, several successful games have provided better and deeper solutions for the virtual worlds, like Minecraft, Fortnite, Animal Crossing, etc.

Centralised virtual worlds as digital spaces should not be confused with Web 3.0. Web 3.0 is an idea for a new iteration of the World Wide Web (www) based on the blockchain and incorporates concepts including decentralisation and token-based economics. Web 3.0 is still an emerging technology, and it is unclear what kind of platforms will be built on it: 1) Open platforms, where purchased NFT items can be transferred to other platforms, or 2) Walled gardens that are closed ecosystems in which ecosystem operators control all the operations and purchased or user-generated NFT items can be utilised only in that particular platform.

In the early 2020s, the investment boom took the development cycle of virtual worlds to the next level. In the mid-2020s, it looks like Web 3.0 hype reached its peak, and many high-profile metaverse initiatives (e.g. Disney's) have been closed down. Now, no/low-code virtual world platforms like Minecraft, Roblox and Fortnite are the market leaders.

No/low-code virtual world platforms offer great gateways to learning and conducting game development, as they require only very elementary or not all coding experience for creating games and game content. Even if players can make revenue by developing games or game content on those platforms, it is, at the moment, more often a hobby than a business. Overall, they provide a good understanding of game development principles, i.e. user retention and engagement. However, it is worth noting that a rising number of game developers have been able to build a solid business (either as content creators or B2B consultants) on these platforms.

In the most hyped visions, this metaverse might provide an alternative to the Internet itself. In the long run, we are moving from no-/low-code virtual world platforms like Minecraft, Roblox, Fortnite or Second Life to something new. Perhaps the games industry is building a universe of Matrixes. However, it will take decades before we are able to move from augmented, virtual and mixed reality to even extended reality or transreality.

To sum up, despite the bold visions, over twenty years later, we're still much closer to the Habbo Hotel than the Matrix. After the metaverse and cryptocurrency bubble, potential market disruption is currently happening around the no/low-code virtual world platforms and play-to-earn (P2E) business model.

For more information, please see the EGDF discussion paper on the Play-To-Earn business model (2022): https://www.egdf.eu/wp-content/uploads/2022/04/NeogamesEGDF_P2Epaper2022.pdf

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?

Depending on the no/low-code virtual world platform, Game developers operating in the current leading no/low-code virtual world platforms can face the following challenges:

- **Limitations to access to data:** Currently, some no/low-code virtual world platforms and virtual worlds provide poor access to player data, while others offer internal data analytic tools and even allow third-party analytic tools. The inadequate access to data significantly hinders using data-driven game design practices. Some of the most profitable game industry business models are based on data-driven game design, which significantly hinders the growth of European businesses on these platforms.
- **Limitations to access to the player community:** Currently, many no/low-code virtual world platforms and virtual worlds provide poor tools to communicate with a player community, and only some offer in-game tools for this. Many game developers use third-party community tools like Discord, but no/low-code virtual worlds often limit how game developers can communicate links to them to players. Game development increasingly happens through co-innovation and dialogue with the fan community. Fan feedback is one of the main ways to improve games, and thus, limitations on reaching and communicating with the fan community can create obstacles to growth for game developers.
- **Censorship and limitations to artistic freedom:** Many no/low-code virtual world platforms and virtual worlds set significant restrictions on what kind of games and game content game developers can publish on their platforms. These restrictions often go beyond the PEGI requirements. PEGI is the European co-regulatory protection of minors system that sets the European standards for content suitable for different age groups.
- **Limitations to freedom to choose distribution channels:** It is often challenging to port games from centralised no/low-code virtual world platforms and virtual worlds to other platforms. This easily traps developers in a single no/low-code virtual world platform. Luckily, some no/low-code platforms allow games to be ported as binary files.
- **Limitations to freedom to conduct business:** Many centralised no/low-code virtual world platforms and virtual worlds set significant restrictions on what business models game developers can use and what third-party game development tools like payment solutions (if any) are available. However, these restrictions are often caused more by, for example, Apple's policies banning third-party payment systems than by the decisions of no/low-code virtual world platforms.
- **Significant platform taxes:** While the current industry standard is a 70% cut for game developers and 30% for the platform, on no/low-code virtual world platforms, the cut for game developers or content creators is easily between 5% and 25% and the no/low-code virtual world platforms take the remaining 75% to 95%. Consequently, although the development on these platforms can be very low risk, these platform taxes present a significant challenge for developers in building profitable businesses.

Game developers building new virtual worlds competing with the market leaders face the following challenges:

- **Market access barriers:** Both hardware ecosystem gatekeepers (e.g., Apple) and leading game production technology developers (e.g., Unity) are experimenting with install fees. Meanwhile, the EU regulators are considering introducing network access fees. When all these fees are combined, they create a significant market access barrier for European SMEs.

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?

Ultimately, the competition between virtual world platforms, such as game industry no/low-code virtual world platforms, is all about competition between players and content.

The free competition among players is based on access to advertisement channels and well-working user-acquisition markets. Currently, many no/low-code virtual worlds platform-based virtual worlds set limitations on what business models content creators can implement in their content. As immersive ads and targeted advertising are enabled only on some virtual worlds, it makes it harder to acquire users in the virtual world for your content as well as to acquire users from competing non-code virtual worlds to a new no/low-code virtual world.

The free competition on content is based on access to a technological and contractual framework allowing cross-platform game development. Currently, many no/low-code virtual world platforms do not enable porting games from their virtual world to another virtual world, making cross-platform game development particularly challenging. This easily traps developers in a single no/low-code virtual world platform. Luckily, some no/low-code platforms allow games to be ported as binary files.

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?

Minecraft, Fortnite and Roblox are the leading no/low-code virtual world platforms.

However, game developers' business models and roles in creating content can vary significantly from one platform to another. In Roblox, for example, game developers can create their own new games, while in Minecraft, they only create extra downloadable content for Minecraft itself. Some of these are more closed-walled gardens. At the same time, others, like Minecraft, provide the opportunity to license Minecraft servers cost-free and have highly permissive IP usage guidelines, creating a flourishing decentralised and competitive ecosystem of independent Minecraft servers.

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

Yes, this can happen, for example, through:

- **Existing social media platforms building their own virtual worlds:** Facebook, for example, is currently trying to build a virtual world on top of its social media platform.
- **Dominant game engines becoming no/low-code virtual world platforms:** Generally, only the biggest game industry giants can afford to build and maintain their own game engines. Most SME game developers rely on third-party game engines to create their games. Year after year, leading commercial third-party game engines, Unity and Unreal, have become more accessible and easier to use and constantly require less coding experience. Consequently, it is not a surprise that an Unreal editor is already available for Fortnite.
- **Mergers and acquisitions:** The game industry has experienced significant market consolidation in recent years. It would not be surprising that one day, leading global digital market gatekeepers like Apple, Google, Meta, ByteDance, and Microsoft will buy the most promising emerging European no/low-code virtual worlds. Microsoft already owns Minecraft.

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?

Yes, the next wave of Web 3.0 virtual worlds, which were funded during the NFT/Play&Earn boom in the early 2020s, will enter the markets in 2024 and 2025.

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?

All successful no/low-code virtual world platforms are based on proprietary technologies, and this trend is likely to continue. On the more decentralised Web 3.0 side, there has been more interest in experimenting with open 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?

Instead of a single monetisation model, the emerging no/low-code virtual world platforms are likely to use a hybrid monetisation model combining elements from several different monetisation models:

- **Free-to-play:** Many no/low-code virtual world platforms will likely be free to download but offer in-platform monetisation models like microtransactions and advertisement.

- **Subscription:** Traditionally, centralised virtual worlds for entertainment have been based on subscription business models. Most likely, upcoming virtual worlds will include a subscription option, e.g. season passes for players providing access to premium features or annual developer fees for content creators operating on their platform.
- **Play-and-Earn:** Some virtual worlds, especially ones built on tradable NFTs or cryptocurrencies, will likely offer users opportunities to earn and cash out the in-game currency. In this model, the virtual world often takes a cut from each transaction on their platform.
- **Pay-per-download:** There might even be virtual worlds requiring a small initial payment to be downloaded.
- **Being platforms:** Many no/low-code virtual worlds are acting as platforms for game developers to create and sell games, and they take a cut from each transaction a game developer makes with a player.

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

The competition issues:

- **The emergence of a few gatekeeper market actors:** Virtual world markets may become highly centralised, and there might be only one or two dominant gatekeeper platforms.
- **The distribution of competing no/low-code virtual world platforms:** It is likely that the same gatekeeper market actors, like Google, Apple, and Microsoft, will develop or acquire their own virtual worlds. In this situation, it is crucial to ensure fair competition between virtual worlds owned by gatekeeper platforms and other virtual worlds.

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

The Commission should consider:

- **Widening the scope of P2B regulation to clearly include virtual worlds and no/low-code platforms:** Currently, it is unclear if no/low-code virtual world platforms fall within the scope of the P2B regulation.
- **Widening the scope to DMA to clearly include no/low-code virtual world platforms:** It is unclear if no/low-code virtual world platforms fall within the scope of the Digital Markets Act.

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 enforcement should happen through competent competition authorities, not through courts:** National and European competition authorities should monitor the development of the virtual worlds and be responsible for enforcing European competition regulations. Any court-based approach is by default too slow. If the only profitable game of a game developer studio was

removed from a no/low-code virtual world platform that forms their primary source of income, the studio would quickly go bankrupt. A typical legal battle in a court usually takes more than a year. Furthermore, no SME will be ready to start a legal fight with uncertain outcomes against their key distribution platform.

Generative AI

In general

The games industry is the forerunner of AI in the cultural and creative sector.

There are no major European gaming devices or platforms left on digital markets. However, European game developers are among the global leaders in digital content.

European games pave the way for exploiting new technological innovations, like generative AI, and adapting new business models, pushing the boundaries of digital games as an artistic audiovisual medium. Thus, the games industry is the forerunner of the digital era. The ever-increasing technological requirements of new games are pushing the boundaries of technological and business innovation. During the last decade, the games industry has pioneered big data analytics and community management. Now, it is taking the same role in using AI in the creative process.

Generative AI tools are just one of the many AI tools used in game production and marketing. For example, AI is widely used in the games industry to create content, improve animation quality, create in-game avatars for players to communicate with, identify bugs, optimise and personalise game difficulty, automate player support, and combat cheating and fraud. The Unity engine is an excellent example of the potential multiplier effects that technologies from the games industry can have on other sectors. The Unity engine was initially developed for games but is now used in the animation, car and architecture industries.¹

The games industry has been experimenting with machine learning-based procedural content creation, AI-generated content, crowd-sourced user-generated fan content, and collectively created open-source code for decades. The new generative AI tools are, therefore, nothing new. Still, although humans will make key artistic decisions for years to come, the EU must build a vision for the new Era of creative content where the majority of the creative content by volume will not be human-made.

The game technology developers are devoted to building ethical AI

The success of the games industry is not just based on the rapid uptake of new AI tools. Unlike many other cultural and creative industries, the games industry builds its own AI tools and works closely with several third-party AI tool developers.

A trustworthy and responsible AI is also important for no/low-risk AI applications like video games. First of all, the video game sector promotes responsible data management. It takes great care to protect player data – whether used traditionally or by AI and to make sure the data is used in a manner consistent with privacy principles and regulations, such as the GDPR.

Secondly, the leading games industry tech developers have published their guiding principles for AI development. Based on them, AI development in the games industry can be summed up as being based on the following principles:

- **Be fair and inclusive and avoid creating or reinforcing unfair bias.** Particular attention should be paid to protecting vulnerable groups such as children and minorities

¹ For more information, please visit: <https://unity.com/madewith>

- Build and test your **AI for reliability and safety**
- **Develop AI for ethically acceptable purposes, be accountable to and responsible for people** and do not use AI to take unfair advantage of them
- **Be trustworthy and secure that AI is in line with privacy and data protection and security design principles**
- **Be transparent, honest and clear with people using the product.** It is particularly important to be transparent about the algorithmic decision-making/AI system's capabilities and limitations, allowing people to set realistic expectations

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:

Generally speaking, the following main components are needed:

1. **Data:** All generative AI systems are as good as the data used to train them.
2. **Talent:** Without access to high-quality engineering and data science talents, it is impossible to build generative AI systems.
3. **Training and deployment resources:** Training generative AI systems requires significant hardware, computing and software resources. This can easily become an expensive process.
4. **AI models:** AI models are based on complex software architectures, optimising algorithms, data preprocessing techniques, etc. Those with access to existing high-quality models have a competitive advantage in the markets.

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.

- **Regulatory uncertainty:** There is currently significant regulatory uncertainty in the EU regarding the distribution and integration of generative AI systems. On the one hand, it is currently unclear how the upcoming AI act will be implemented regarding generative AI models. On the other hand, there is significant regulatory uncertainty around copyright questions related to the use of generative AI technologies for content creation.
- **Lack of talent and resources:** Only giant game industry conglomerates have access to resources (talent, funding and data) to build their proprietary AI tools for in-house generative content creation. SME game developer studios especially rely on third-party AI tools tailored for their internal use through technological (e.g., running on internal servers) and contractual (e.g. data not being used for further training of AI models) safeguards.

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?

- **Access to data:** All generative AI systems are as good as the data used to train them.
- **Access to talent:** Without access to high-quality engineering and data science talents, it is impossible to build generative AI systems.
- **Access to AI training and deployment resources:** Training generative AI systems requires significant hardware, computing and software resources. This can easily become an expensive process.
- **Access to AI models:** AI models are based on complex software architectures, optimising algorithms, data preprocessing techniques, etc. Those with access to existing high-quality models have a competitive advantage in the markets.

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.

- **Bundling:** Over the years, Unity has, step by step, bundled its game engine more and more with other game development tools under the Unity Gaming Services portfolio. Unity is not just a game engine; it is also an AI tool, a player sign-in and authentication service, a game version control tool, a player engagement service, a game analytics service, a game chat service, a crash reporting tool, a game ad network, game ad mediation tool, an user acquisition service and in-game store building tool. This creates a significant vendor lock risk for game developers using Unity services. In the long run, this makes it difficult for many generative AI tool developers and other game middleware developers to compete against Unity.

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?

- **Licence or subscription fee for training in-house models:** SME game developer studios especially rely on third-party AI tools tailored for their internal use through technological (e.g. run on internal servers) and contractual (e.g. data is not used for further training of AI models) safeguards. These generative AI tools will often be bundled with other game production tools like game engines.
- **A subscription fee for using open generative AI tools:** Open generative AI tools will likely rely on subscription-based models. It is a good question whether or not data the users of these tools submit for training these models should also be considered part of the exchange.

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.

No, because

- **Poorer access to computing time and power:** Open-source generative AI systems rarely have access to similar resources for paying for computing time and power as their commercial competitors.
- **Poorer access to data:** Open-source generative AI systems rarely have access to data similar to that of their commercial competitors for training the models.

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?

Without training data, there are no generative AI systems. The key characteristics are:

1. **Data quality:** All generative AI systems are as good as the data used to train them.
2. **Quantity and diversity of the data:** The more and more diverse the data is, the better.
3. **Legal compliance of the data:** The data used to train AI models must be collected legally and ethically.

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 crucial role in enabling competition between generative AI systems:

1. **Interoperability with third-party tools and services:** Those generative AI systems that are interoperable with other key third-party tools and services (e.g. game engines, email clients and graphics editors) will have a significant competitive advantage.
2. **Data interoperability:** The easier it is to port training data from one competing generative AI tool to another inside a company, the more competition there will be between AI solutions.

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.

Yes, vertically integrated companies can block market access to competing tools by bundling the generative AI tools with their core service.

10) What is the rationale for 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?

There are several reasons for this:

- **Access to talent:** It is currently challenging to access top talent with strong experience in building generative AI models. Sometimes, buying a company with the required talent base is easier than recruiting those people from open job markets.
- **Access to data:** The more data and more diverse data you have, the better AI models you can build. Nowadays, the risk of your data being sold to your competitor together with your service provider is one of the key risks of using third-party services.
- **Bundling AI tools in existing services:** Instead of opening existing services the company offers for competing AI tools, large companies prefer to build their own tools. Sometimes, this can be done by buying a company that has already developed a required tool. On the one hand, this causes significant challenges for those smaller companies who have relied on the services of the acquired company and cannot find similar services from the market. On the other hand, when a large company builds its own integrated generative AI tool for their service, it often kills the market for third-party generative AI tools that have been integrated into the service, e.g., through plug-ins.

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?

Yes:

- **Widening the scope to DMA to clearly include generative AI models:** Currently, generative AI models are not within the scope of the Digital Markets Act.
- **Fair contract terms:** The commission must create a specific legal framework for unfair, non-negotiable standard contracts used by AI tool developers. AI tools rarely include privacy or confidentiality agreements in their standard contract terms. Even more importantly, the differences between the non-negotiable contract terms, for example, popular generative AI tool developers are forcing on their users, are enormous.

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

- **The enforcement should happen through competent competition authorities, not through courts:** National and European competition authorities should monitor the development of the virtual worlds and be responsible for enforcing European competition regulations on them. Any court-based approach is, by default, too slow. A typical legal battle in a court usually takes more than a year.