

THE STATE OF THE EUROPEAN GAME INDUSTRY

AND HOW TO UNLEASH
ITS FULL POTENTIAL



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Culture & Creativity



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EXECUTIVE SUMMARY

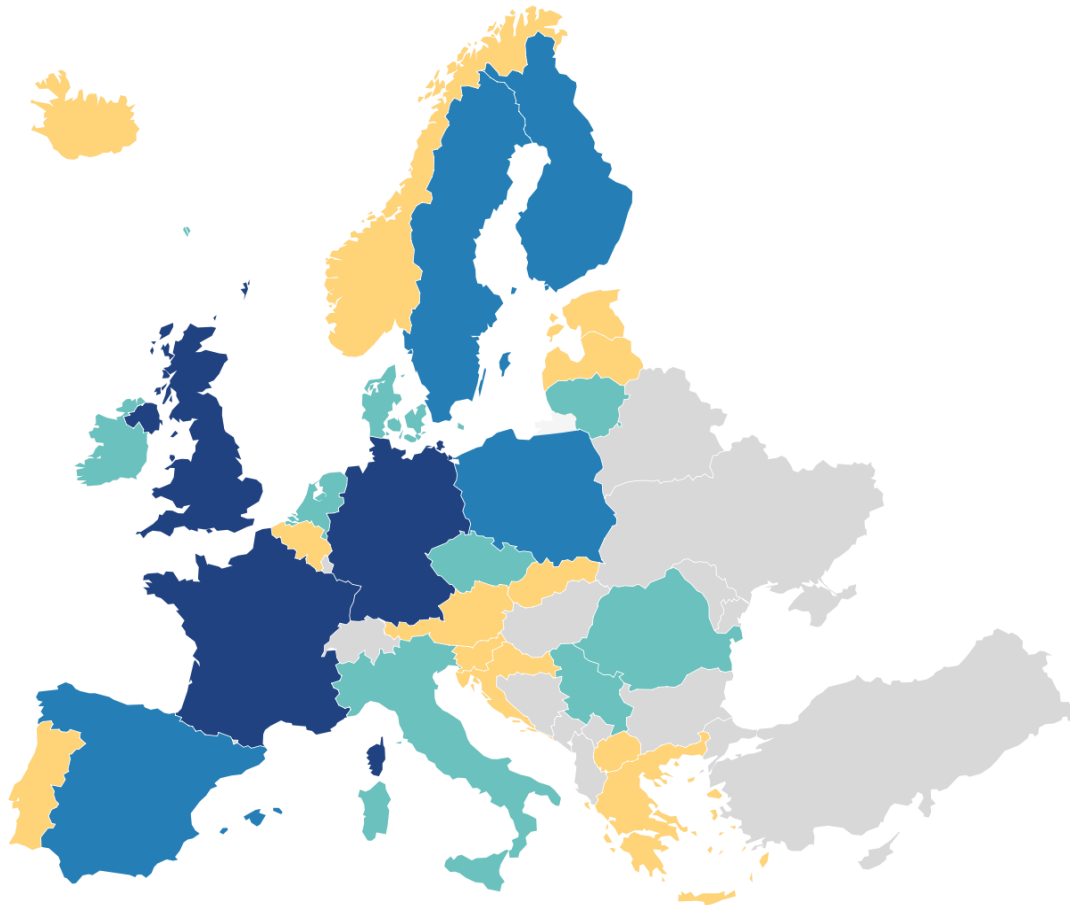
Over 3 billion people play video games worldwide, and games are EUR 179 billion global market. However, in the EU games are only a **EUR 18.3 billion industry** meaning that the share of European game developer studios in the global games market was 11% in 2021. Despite the current downturn, several game industry consulting companies predict the game market will grow with a CAGR to around 10 - 12 % during the next years. With that growth rate, the global game market will be worth over EUR 400 billion in 2030.

If the EU wants to maintain its share of the global markets, the European game industry turnover should be well over EUR 40 billion by 2030, more than twice its current size. Without well-targeted public support, reaching this goal will be extremely difficult for the European game industry, leading to an even stronger American and Chinese game market dominance.

National Game Development Ecosystems in Europe (2021)

VALUE

Group A Low Capacity Game Development countries Group B Moderate Capacity Game Development countries Group C Strong Game Development Countries Group D Leading Game Development Countries



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MAIN EMERGING OPPORTUNITIES ENABLING THE EUROPEAN GAMES INDUSTRY TO GROW

Building your own future: European gamedev technologies through innovation and research

What? As a forerunner of digital industries, the game industry is going through never-ending waves of technological, business and artistic disruptions. The industry has the technical, business and artistic capacity to address the challenges and changes caused by these disruptions. **To keep the technological forerunner advantage in the EU, support structures are needed to mainstream information on new opportunities (e.g. building and using AI) and support European SMEs in building novel tools and services.**

Artificial intelligence (AI), is poised to become the next transformative force in society, extending its impact beyond game development to influence various sectors. As mapped in Annex 3, it encompasses more than just content creation in games; it plays a crucial role in enhancing processes across all activities in a game developer studio. Addressing copyright and regulatory aspects of AI is essential, but its potential spans far beyond copyright issues. Companies striving to compete in global markets must harness AI to its fullest potential. This involves integrating AI tools and refining and tailoring them to the specific requirements of different levels within game development and business operations.

Recognizing the strides made by global superpowers like China and the USA in AI investments, the European Union must not lag behind. The development of AI tools constitutes a form of research and development (R&D) demanding targeted investments. Supporting European game developers in this endeavour and establishing best practices can bestow significant advantages in the fiercely competitive global landscape. The disruptive nature of AI creates unprecedented opportunities, especially for emerging startups.

Meanwhile, additional public support instruments in the EU are mapping different methods to include corporate (environmental, social and administrative) sustainability in the eligibility criteria for public funding. Game developer studios and game industry investments are becoming subject to sustainability regulation.

Access to risk capital to exploit these opportunities is a huge challenge, especially in the low-capacity game production countries that lack local support structures like cluster organizations or game industry trade associations. In moderate-capacity game development countries, the challenge is to encourage the creation of spin-off companies from major local game development studios and help them become scale-up companies.

How?

1. European game developers should be the first to explore emerging market opportunities and disruptions. Furthermore, they should use their technological forerunner status as their competitive advantage. EIT CCSI should introduce support instruments for exploring new opportunities and disruptions: AI-driven tools and production methods, user-generated content, use of third-party payment systems, and introduction of third-party application stores enabled by DMA, Web3, and no-code platforms. EIT CCSI should encourage the development of European alternatives of crucial game industry technologies like game engines. **EIT CCSI should promote the creation and scaling up of national game industry-focused VC funds and encourage EU VC funds to invest in the game industry (EIT investor club).**
2. Major game industry exits should lead to investments back into game industry. **EIT CCSI should introduce and experiment with new novel support mechanisms uniting cultural, business, SME and R&D support instruments in unified support measures specialized for the needs of the game industry (EIT CCSI policy club).**
3. All European game developer studios and publishers should have access to an extensive list of sustainability tools and best practices. **EIT CCSI should boost the development and mainstreaming of sustainable game development practices beyond environmental sustainability.**
4. **EIT CCSI should help game research to work in close cooperation** with the industry, building scenarios about future possibilities.

Exploiting the opportunity: The disruptions of digital value chains

What? One core enabling factor in the success of the European games industry has been its ability to secure its position in the value chain. However, compared to the leading game development countries globally, (the USA and China), the EU lacks their distribution platforms, and only a few global industry giants are based in the EU. European game developer studios are struggling with limitations set by key game distribution platforms who act as gatekeepers in the main game industry market segments in some cases restricting access to data, market access, and the choice of distribution channels.

Saturated game markets cause significant challenges related to the discoverability of European games. **Europe is good at creating games but weaker at game distribution and publishing.** Conversely, game markets are becoming increasingly saturated and consolidated in the hands of a few leading global game industry giants. Due to these increasing market access barriers, Europe imports more games than it exports.

It is no longer enough to make a great game; finding the right distribution and marketing channels and partners are equally important. Often, game developers are good at making games and rely on publishers for their marketing and distribution. Unfortunately, there are only a few European publishers.

The new European regulatory framework for gatekeeper platforms disrupts the game industry's value chain for digital distribution. It provides significant new market access opportunities for European game developer studios, as they have a route to strengthen their position in the value chain and start selling and distributing their games directly to their consumers.

How? It should be easy for European players to find and access to European games. The European game industry must be able to:

1. Recognize and fully exploit potential market disruptions in value chains and utilize them. Find a way to operate as near to the customers/players as possible. **EIT CCSI should support experimentation with new support models built for test marketing and audience building within the game industry and support instruments bridging the gap between cultural funding for artistic excellence and R&D funding for business and technological merit.**
2. Build and foster communities in and outside the game itself. **The European game industry must be able to create new venues and value chains by incorporating existing ones in a new way.**
3. **Co-operate with other European creative industries** in digital and non-digital value chains to create new intelligent ways to utilize the strengths of different industries maximizing their impact, e.g. in brand building. Europe's leading national game industry hubs should have their own cluster/community organization, enabling and facilitating internal and external knowledge sharing. EIT CCSI should support European SMEs in joining leading global game industry conferences and joint country branding initiatives for talent attraction and support for national and local game developer community organizations that facilitates game industry peer support on the local level.
4. **In low-capacity countries, the EIT CCSI must support the transition of the game industry from outsourcing and production companies to autonomous game developer studios** focused on creating their own IPs and making their artistic business (e.g. game development tools and services, R&D, distribution and marketing) and administrative decisions (e.g. HR) in the studio itself. This can be done through MOOCs focused on capacity building and support in creating game industry incubators and accelerators.



Access to talent: Professional game education as a catalyst for change

What? Access to talent is one of the main bottlenecks for the industry's growth. The European game industry, particularly the strong game development countries, struggle to access top global talent needed for continued growth. Professional game education is underdeveloped in many EU member states, and local immigration rules hinder talent immigration. Meanwhile, cross-border remote work is becoming increasingly popular, but the EU lacks a clear and solid regulatory framework.

Professional game education institutions training the new generations of talent for the industry can act as catalysts of the adaptation of new tools (e.g. AI tools) and exploit the innovations in digital distribution of education like (Massive Open Online Courses) to secure as good as possible access to the latest knowledge and skills.

How? Professional game education institutions must:

1. **With the help of EIT CCSI, build a new curriculum and implement new AI tools into education** and training to offer students (and thus the industry) the possibility to expand their capabilities and productivity.
2. **With the help of EIT CCSI, explore opportunities for building synergies** through organizing shared lectures and exchanging their Open Online Courses between selected educational institutions.
3. **With the help of EIT CCSI, enable close cooperation with education and industry** in planning curriculums, internships and mentoring.
4. Secure that target groups are aware of education and the possibilities the game industry can offer so that professional game education becomes the most attractive career choice among the best young talents. **EIT CCSI should enable the introduction of professional game education in the low-capacity game development countries where it is lacking and support the development of business skills in the industry.**

Understanding your restrictions: Being the best at exploring new opportunities created by European regulations

What? The EU is the global leader in shaping humanity's digital future through regulation. **European SMEs have an opportunity to be the global leaders in exploiting the new opportunities created by the regulatory changes. It should be easy and affordable for all European game developers to access, understand and follow the European regulatory framework for making games.**

How? The European game industry must be well informed and ready to exploit regulatory and technological changes, creating possibilities for SMEs. **EIT CCSI should support initiatives mainstreaming information and provide guidance on key regulatory requirements (e.g., platform regulation, IP protection, immigration rules, and cross-border remote work) on publishing games in the EU's digital single market area. EIT CCSI should help game developer studios fully explore the market opportunities brought by the Digital Markets Act (e.g., access to data, third-party payment tools, and alternative distribution channels).**





THEORY OF CHANGE THROUGH THE KEY PRIORY ACTIONS

THE FIVE INNOVATION TOOLS	OUTPUT FUNDED BY CCSI GRANTS	INTERMEDIATE 1	INTERMEDIATE 2	IMPACT –15 YEARS
1. EDUCATION	EIT CCSI provides an open standard curriculum to include AI tools in existing game industry curriculums at all levels of professional game education.	Educational institutions share best practices and lectures, and operate in close co-operation with the industry to update open curriculum standards. The quality of game education is enhanced and better meets industry needs.	The number of good-quality game education graduates meets the industry's needs. Cross-border work seamlessly across borders.	The European game industry consists of companies at all levels within the value chain, starting from developers and ending near consumer operations, e.g. distribution/platforms. The European game industry is a globally renowned developer of high-quality game content and services with technologically advanced methods. The European game industry ecosystem is strong, and game research and game education constantly cooperate with the industry. The European game industry cooperates with other CCSIs to fully utilize the capacity of European creativity. Corporate responsibility and sustainability topics are well managed. The European share of the revenues of the global game market is 20%.
2. DIGITAL TRANSFORMATION OF VALUE THE CHAIN	EIT CCSI provides the European game industry with high-risk innovation funding to explore the new possibilities created by new technologies like no-code platforms and changes in regulatory frameworks like DMA.	New European no-code platforms, third-party application stores or in-game stores are launched with the support of EIT CCSI.	The industry can create solid business and value chains around them. The European game industry finds a way to operate as close to customers/players as possible and builds and fosters communities outside the game itself. European companies' share of revenue increases.	
3. INNOVATION AND RESEARCH	EIT CCSI supports exploring new opportunities, disruptions and knowledge sharing: AI, User Generated Content, use of third-party payment systems and introduction of third-party application stores enabled by DMA, Web3, sustainability practices, no-code platforms	Innovation and research operate in close cooperation with the industry, building scenarios about future possibilities. The European game industry is present in all key game industry events. All key game industry hubs have their own game industry-focused cluster/community organisation.	Innovation mechanisms and research are integral parts to offer foresight into the European game industry.	
4. MOBILIZATION & AWARENESS	EIT CCSI supports the creation of up-to-date model contract terms and helps create legal guidance documents facilitating market access.	The European game industry is well-informed about regulatory and technological changes, creating possibilities for SMEs.	Utilizing disruptions and changes offers the European game industry a competitive edge in the global market	

1. INTRODUCTION

As the European video game industry's cultural, economic, and technological importance is constantly growing, European decision-makers and research bodies are paying extensive attention to it. The goal of this report is not to compete with the recent *European Media Industry Outlook*¹ and *Understanding the Value of European Video Games Society report*². Instead, we aim to build on their findings and cover some areas left outside their focus in more detail.

We provide a detailed overview of the national game industry ecosystems in Europe; the challenges European game developers face in key market segments and how they try to monetise their content through different business models. A good understanding of these aspects within the video game sector is crucial for the second part of our report, which aims to provide recommendations for the EIT CCSI on overcoming critical barriers and limitations hindering the sector's growth. We will demonstrate that support for technological innovation or game production alone is not enough to address the challenges the sector is facing. Instead, a new, more systemic ecosystem-level approach, aiming to strengthen the position of the European game industry in the global game industry value chain is needed.

1) The European Media Industry Outlook. Available in: <https://digital-strategy.ec.europa.eu/en/library/european-media-industry-outlook>

2) EUROPEAN COMMISSION: Understanding the value of a European Video Games Society. Available in: <https://digital-strategy.ec.europa.eu/en/library/study-european-video-games-sector>



2. STATE OF THE EUROPEAN GAMES INDUSTRY

2.1. KEY INDICATORS

GAME MARKETS

Games are over EUR 170 billion market globally. According to Newzoo Global Games Market Report 2023³, the global games market keeps growing with a +2,6 year-on-year growth in 2023, generating USD 187.7 billion.

Over 3 billion people play digital games worldwide. The number of players is estimated to reach 3,32 billion in 2024⁴.

246 million European citizens play games. The number of players is estimated to reach 3,32 billion in 2024.⁵

Games are EUR 23.3 billion markets in Europe. According to European Media Industry Outlook⁶, with its EUR 23,3 billion games sales, the EU was the third largest game market globally in 2021. The size of the European game market is substantially more than the combined global turnover of the European game industry, indicating that the EU imports more games than it exports.

Revenue generated by games is larger than music or video on demand. According to Ecorys and KEA report⁷, the revenue generated by the games sector is 4,3 times higher than that of the music industry and 1,8 times higher than video on demand, highlighting the financial importance of the sector in Europe.

3) Newzoo: Global Games Market Report 2023 August 2023. Available in: <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

4) Exploding topics: How Many Gamers Are There? (New 2023 Statistics). Available in: <https://explodingtopics.com/blog/number-of-gamers>

5) EUROPEAN COMMISSION: Study on European video games sector. Available in: <https://digital-strategy.ec.europa.eu/en/library/study-european-video-games-sector>

6) The European Media Industry Outlook. Available in: <https://digital-strategy.ec.europa.eu/en/library/european-media-industry-outlook>

7) EUROPEAN COMMISSION: Understanding the value of a European Video Games Society. Available in: <https://digital-strategy.ec.europa.eu/en/library/study-european-video-games-sector>



GAME INDUSTRY

Games are a EUR 18.3 billion industry in the EU. According to a report by EGDF and VGE⁸, the combined global turnover of EU game developer studios and publishers was EUR 18,3 billion in 2021. In the same year, the global games market was estimated to be EUR165 billion. With these figures, the share of European game developer studios of the international games markets was 11% in 2021.

Based on several opinions of game industry consulting companies, the game market is expected to grow in the future years, with a CAGR of around 10 - 12 %. With that growth rate, games would be an approximately EUR 400 billion market in 2030. If the EU wants to maintain its share of the global markets, the European game industry turnover should be well over EUR40 billion by 2030, more than twice its current size.

Europe is good at creating games but weak at game distribution and publishing, which is one of the key challenges hindering the European game industry from reaching its goal. Currently, all major platforms in mobile, console and PCs are owned by non-European companies. Among the 25 biggest game industry publisher-developer-investor conglomerates by revenue, there are only two Europe-based corporate groups (Ubisoft in France and Embracer Group in Sweden).⁹

Key challenges

- **The EU imports more games than it exports.**
- **If the European game industry wants to maintain its current market share, its turnover should be well over EUR 40 billion by 2030, more than twice its current size.**
- **Europe is good at creating games but weak at game distribution and publishing.**

⁸) EGDF-VGE: 2021 European Video Game Industry Insight Report. Available in:
<https://www.egdf.eu/wp-content/uploads/2023/09/EGDF-VGE-video-game-industry-report2021.pdf>

⁹) Newzoo Top public games companies by revenues. Available in:
<https://newzoo.com/resources/rankings/top-25-companies-game-revenues>

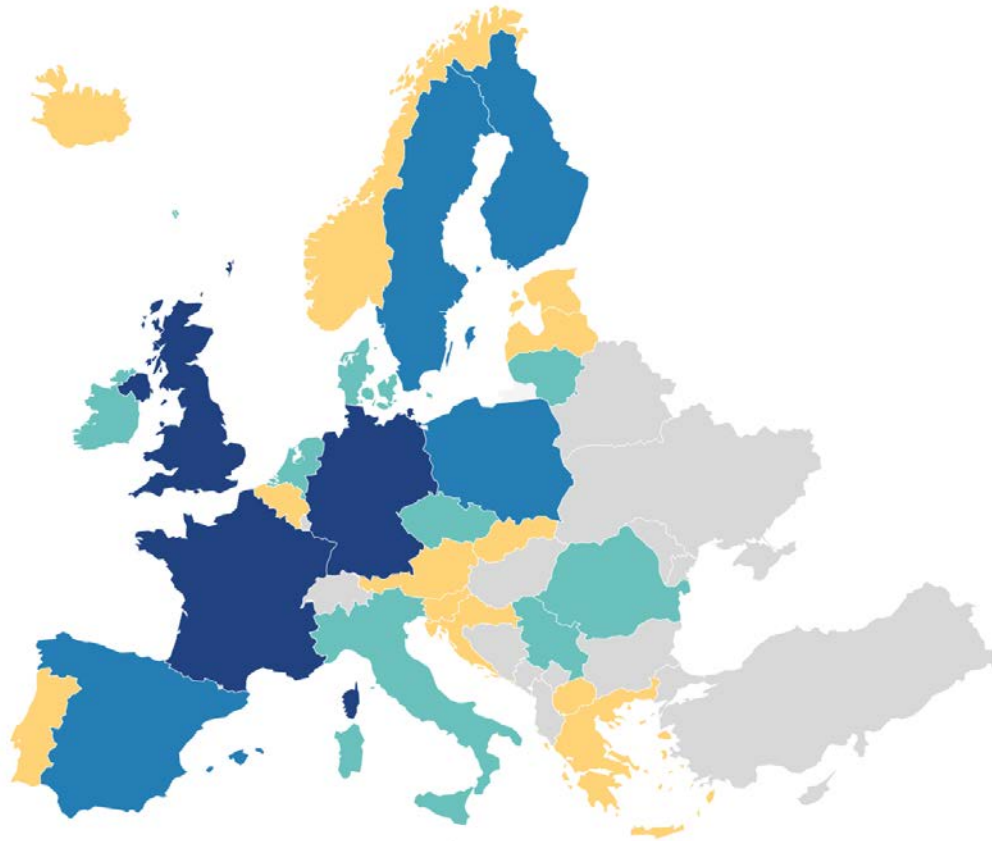


2.2. THE STATE OF THE NATIONAL GAME DEVELOPMENT ECOSYSTEMS IN EUROPE

National Game Development Ecosystems in Europe (2021)

VALUE

Group A Low Capacity Game Development Countries Group B Moderate Capacity Game Development countries Group C Strong Game Development Countries Group D Leading Game Development Countries



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Based on the Annual EGDF data on the European Game Industry,¹⁰ the national game industry ecosystems in Europe can be divided into four groups:

- **Group A: Low-capacity game development countries:** These countries have less than 100 game developer studios, less than 1000 people working for the game developer studios, or less than 100M combined industry turnover.
- **Group B: Moderate capacity game development countries:** These countries are home to more than 100 game developer studios, have more than 1000 people working for the game developer studios and run over EUR 100M combined turnover.
- **Group C: Strong capacity game development countries:** These countries are home to well over 100 game developer studios, have well over 1000 people working for the game developer studios and run over EUR 1B combined turnover.
- **Group D: Leading game development countries:** These countries are home to close to or more than 1 000 game developer studios, have more than 10 000 people working for the game developer studios and run well over EUR 1B combined turnover.

¹⁰) 2021 European Video Game Industry Insights Report. Available in:
<https://www.egdf.eu/wp-content/uploads/2023/09/EGDF-VGE-video-game-industry-report2021.pdf>

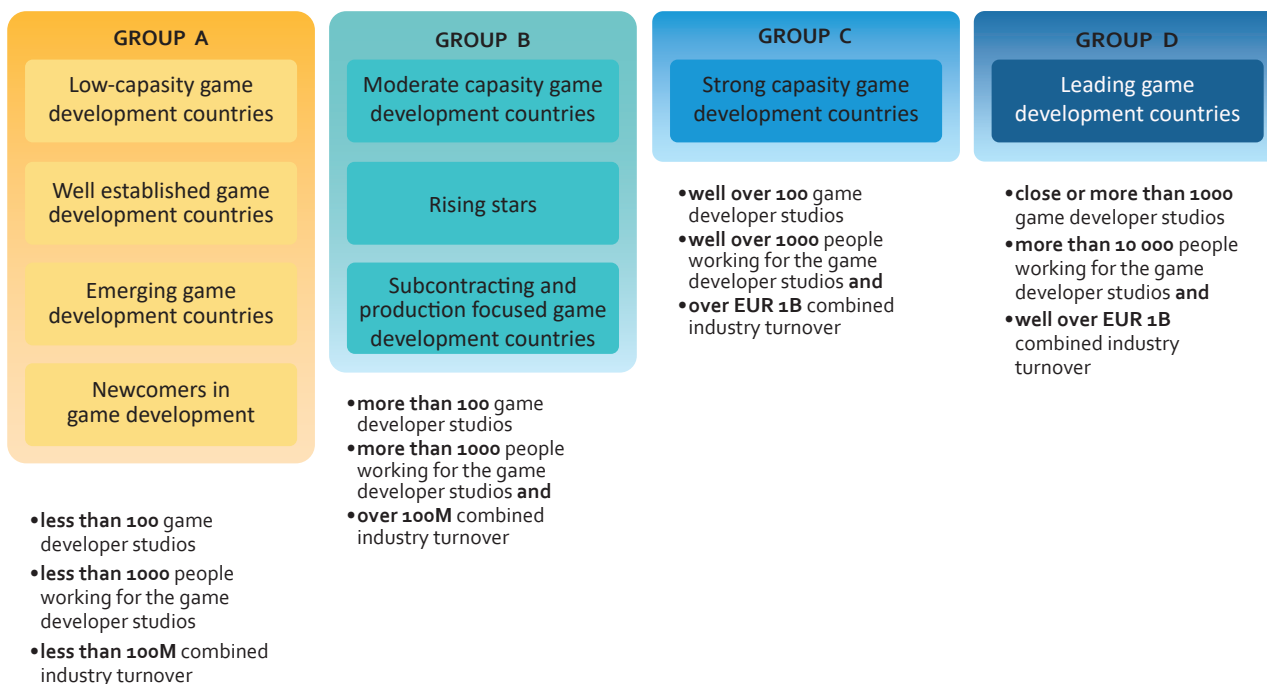
EGDF does not have data on all countries covered by EIT CCSI. After examining external data sources, we would estimate, that out of these countries whose info is based on external data sources:

- **Group A** also includes Switzerland, Hungary, Moldova, Bosnia Herzegovina, Montenegro, Albania, Malta (studios not involved in gambling), Kosovo, Luxembourg.
- **Group B** also includes Bulgaria, Ukraine (which could have been close to Group C before the war) and Cyprus.
- **Group C** also includes Turkey.

It is essential to notice that in the game industry, factors like the size of the home market or the national population have only a moderate impact on the success of the national game industry ecosystems. The UK, France and Germany have big game industry home markets and massive populations, and they are also the game industry leaders in Europe. Sweden and Finland both have a strong national game industry despite having small home markets and relatively small populations. Italy and Greece have large national game markets and significant populations, but they are far from being the European industry leaders.

When we compare the strength of the national game industry ecosystems with the European Innovation scoreboard¹¹, it is clear that strong innovation capacity also helps the success of the local game industry. However, similar to population and home markets, the connection to the strength of the local game industry ecosystem is not strong. Finland and Sweden are outperforming both in their innovation and game industry production capacity. Many innovation leaders, such as Belgium and Denmark, have relatively weak national game industries. Poland and Romania are examples of countries where the game industry has been able to overcome the limitations caused by the weak innovation capacity of their home countries.

For more information on individual national game industry ecosystems, please see Annex 1.



¹¹) European Commission European Innovation Scoreboard. Available in: https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

Group A: Low-capacity game development countries

Low-capacity game development countries can be further divided into three groups.

The first group, well-established game development countries, Austria, Belgium, Croatia, Portugal, Slovakia, Iceland, and Norway, have well-established support structures for the local industry. For example, their local industry associations operate on solid ground. In most of these countries, professional game education is well established. These countries have a solid growth track with great potential to become moderate-capacity game development countries within the next 5-10 years.

The second group, emerging game development countries Latvia, Estonia, Slovenia, Greece, and North Macedonia, do not have well-established support structures for the local game industry. Their local industry associations are young or barely existing. In these countries, professional game education hardly exists.

The third group, newcomers in game development countries Malta, Hungary, Moldova, Bosnia Herzegovina, and Montenegro, are somewhat of a dark spot in the European game industry. They have some local game developer studios and, in some cases, some local support structures and emerging industry associations and have barely any professional game education.

Key challenges:

- **Establishing and stabilising local structures** like cluster organisations or game industry trade associations facilitating the growth of the local game industry.
- **Enabling access to (local) risk capital** to enable the growth of local companies.
- **Building strong professional game education system.**
- **Access to experienced senior talent.**

Group B: Moderate capacity game development countries

Moderate-capacity game development countries all have sufficient studio and employee bases to run a self-sustaining local game industry ecosystem. However, they have not had a huge local success story, pushing the industry turnover to over EUR 1B. Many of these countries have local game industry-focused VC funds, and some have game industry-focused game support instruments. Apart from Romania and Denmark, all have a well-established base of professional game education institutions training the next generation of new talent for the industry.

Group B can be divided into two subgroups. **The first sub-group, subcontracting and production-focused countries,** consists of Romania, Bulgaria, Serbia and Lithuania. Romania and Serbia are both countries that are popular destinations for subcontracting and have local production studios. Lithuania has experienced a massive boom in their local game development ecosystem after international companies operating in Belarus relocated their studios from Minsk to Vilnius due to the war in Ukraine. Countries in this group have a specific challenge of building a flourishing spin-off start-up ecosystem around the big production studios in the country.

The second group, rising stars, are established game development countries, such as Czechia, the Netherlands, Denmark, Italy, and Ireland. They all have sufficient talent and a company base for success, but they are still short to witness the first big success story that will push the industry turnover into an entirely new level. All these countries have a strong indie game communities.

Key challenges:

- **How to build a spin-off start-up ecosystem** when you have large production companies of dominant global game industry giants in your country.
- **Lack of incubators:** how to support indie game studios in transforming themselves into scale-up companies.
- **Access to experienced senior talent**
- **Enabling access to (local) risk capital** to enable the growth of local companies.

Group C: Strong capacity game development countries

Strong game development countries all have sufficient studio and employee bases to run a self-sustaining local game industry ecosystem. All these countries have a well-established professional game education framework and local game industry-focused VCs. Sweden, Finland, and Spain have well established and successful support structures for other countries to benchmark:

- **Sweden:** Local game industry clusters and incubators¹²
- **Finland:** Business Finland R&D support¹³
- **Spain:** Country branding and talent attraction (Barcelona)¹⁴

Finland (Supercell, Rovio, Small Giant), Sweden (Embracer, Paradox, King and Mojang) and Poland (CD Projekt Red and Tens Square Games) are home to some of the key European Game industry unicorns pushing the local game industry turnover over EUR 1 billion. Barcelona in Spain is one of the most attractive locations for global game industry talent and is home to many studios owned by big global game industry giants. When this is combined with several successful local game developer studios (e.g. Digital Legends), Spain has been able to build a highly successful local game industry ecosystem.

Key challenges:

- **Access to experienced senior talent**
- **Strengthening and widening already existing support instruments**

Group D: Leading game development countries

Leading game development countries all have more than sufficient studio and employee base to run a self-sustaining local game industry ecosystem and a well-established professional game education framework and local game industry-focused VCs. Additionally, these countries have well-established and successful support instruments specifically dedicated to game development for other countries to benchmark:

- **France:** The French Video Game Tax Credit is Europe's oldest big public support instrument dedicated to game development.¹⁵
- **UK:** The UK Video Game Tax Relief is Europe's second oldest major public support instrument dedicated to game development¹⁶.
- **Germany:** Federal Funding for Video Games is the biggest grant-based public support instrument dedicated to the game industry in Europe¹⁷.

The leading game development countries are the ones where the global game industry giants have their headquarters. For example, Sony has its European headquarters in the UK, Nintendo in Germany, and Ubisoft's global headquarters are in France. Due to a broad studio base and several successful studios, their combined national game industry turnover is well over EUR 1B.

Key challenges:

- Access to experienced senior talent.
- Strengthening and widening already existing support instruments.

12) For more information, please visit for example Game Habitat <https://www.gamehabitat.se/> (Malmö), Sweden Game Arena <https://swedengamearena.com/en/us/> (Skövde), Actic Game <https://arcticgame.se/> (Umeå/Luleå),

13) For more information, please visit Business Finland support instruments: <https://www.businessfinland.fi/en/for-finnish-customers/home>

14) For more information, please visit Barcelona International Welcome Desk <https://www.barcelona.cat/internationalwelcome/en/welcome-desk>

15) For more information, please visit: https://www.cnc.fr/web/en/funds/tax-credit-for-videogames_137201

16) For more information, please visit: <https://www.gov.uk/guidance/claiming-video-games-tax-relief-for-corporation-tax>

17) For more information, please visit: <https://www.bmwk.de/Redaktion/EN/Artikel/Economy/Games/federal-funding-for-video-games.html>

3. KEY TRENDS SHAPING THE GAME INDUSTRY

3.1. KEY MEGATRENDS

Inflation and economic downturn slow growth

After the initial shock, the Corona pandemic turned out to be a period of massive growth in the game industry. The end of the pandemic caused a decline in game industry revenues for the first time in 15 years¹⁸. Currently we see growth returning to the pre-pandemic trajectory. However, some new threats have arisen (i.e. the availability of microchips, trade tensions between the US and China, and escalating regional wars in Europe and the Middle East).

Uncertainty of the global economy makes the game industry's potential investors more hesitant. Hyped trends, i.e. Blockchain, NFT, and Metaverse, coming and going like shooting stars, are making the future more challenging to forecast and failed promises cause cautiousness on the investor side. Despite Newzoo's optimistic long-run estimates,¹⁹ the potential drop in consumer purchasing power caused by inflation also affects the game industry.

Key challenges:

- **Investment winter:** Rising private risk funding, especially for the first-round game industry start-ups, is exceptionally challenging as game investors hesitate to make investment decisions.
- **Increased competition:** So far, the constant game market growth has meant that there has been more room in the markets for SME game developer studios with their novel IPs. Economic and market downturns have made competition in the markets even more challenging than before. Consumers are more selective with their purchase decisions.

China, the USA and the EU are the three big game market powers, but China and the US are the leading industry powers

According to Newzoo's estimates of 2023, the European market represents 13% of the global players market, while Asia-Pacific (i.e. India, China, Japan and South Korea) represent more than half (53%). In revenue share, Europe represents 18%, Asia-Pacific 46% and the US 27% of the total global revenue generated. Based on revenue, these three markets are dominating the global games market.²⁰ However, Chinese market power is limited by its strict protectionist policies.

It is worth mentioning that Chinese game companies are generating 47% of mobile game revenue worldwide, and Chinese Tencent is the world's largest public company based on game revenues.²¹ Currently, all major platforms in mobile, console and PCs are owned by non-European companies, and among the 25 largest game industry publisher-developer-investor conglomerates by revenue, there are only two Europe-based companies (Ubisoft in France and Embracer in Sweden), while the rest are mainly American or Chinese companies.²²

18) Protocol: The game industry is feeling the economic squeeze. Available in:
<https://www.protocol.com/newsletters/entertainment/game-industry-shrinking-recession-ampere>

19) Newzoo: Global Games Market Report 2023 August 2023. Available in:
<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

20) Newzoo: Global Games Market Report 2023 August 2023. Available in:
<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

21) Newzoo: Global Games Market Report 2023 August 2023. Available in:
<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>
BusinessWire: China Mobile Games Market 5-Year Forecast Report 2023: Available in:
www.businesswire.com/news/home/20230629085200/en/China-Mobile-Games-Market-5-Year-Forecast-Report-2023-Total-Market-for-PC-Mobile-and-Console-Games-Revenue-Forecast-to-Surpass-57-Billion-in-2027---ResearchAndMarkets.com
Newzoo: Global Games Market Report 2023 August 2023. Available in:
<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

22) Newzoo Top public games companies by revenues:
<https://newzoo.com/resources/rankings/top-25-companies-game-revenues>

Key challenges:

- **Lack of a forerunner advantage:** As none of the leading game industry distribution platforms are based in the EU, the forerunner advantage is often with the game developers located closest to the headquarters of the big global game distribution platforms, as payment solutions and child protection practices are tailored primarily for their home markets.
- **Lack of strategic expertise:** The more high-level strategic decision-making happens in the headquarters of the big corporate groups outside the EU, the more the EU will become a production location. Additionally, less individuals with strategic visions and experience in growing and running a successful global game industry company inside the EU will exist.



Market saturation and consolidation make it harder for European SMEs to enter markets

As game markets are overflowing and saturated, the competition on players tightens and drives the market towards consolidation. The larger established game studios have better chances to secure their places in markets due to their development and marketing budgets. Sony, Microsoft, Tencent, Nintendo, Activision Blizzard and other giants have dominated the game market's top revenues.

The threshold for becoming an amateur game developer continues to fall due to improving development tools, user-generated content, and no-code platforms. Creating profitable games-related business operations will be increasingly challenging as competition gets tougher and costs of user acquisition (marketing) are skyrocketing. Although top-grossing lists are dominated mainly by international, giant game companies, it is still possible for smaller and indie studios to conduct profitable business in smaller niche genres and can even break through to wider segments. Smaller studios are often more sensitive in foreseeing market signals and agile in executing their strategies related to them. This is one reason why giants often acquire midsize studios

Identified key challenges:

- **Competitive market access barriers:** Global game industry giants have access to cutting-edge internal tools and almost unlimited marketing budgets. This makes it difficult for European SMEs to compete directly against them.
- **Discoverability:** Game market saturation leads to significant challenges to discoverability of the games.

Regulation fragments the global markets

The role of regulation in today's game development and business has increased drastically compared to the past. The days of the wild web are long gone. Legislation applies to game development in many ways: player privacy, protection of minors, copyrights, consumer protection, taxation, etc. Different local rules are fragmenting global markets. Some countries, like China, require government approval for every game released in their market.

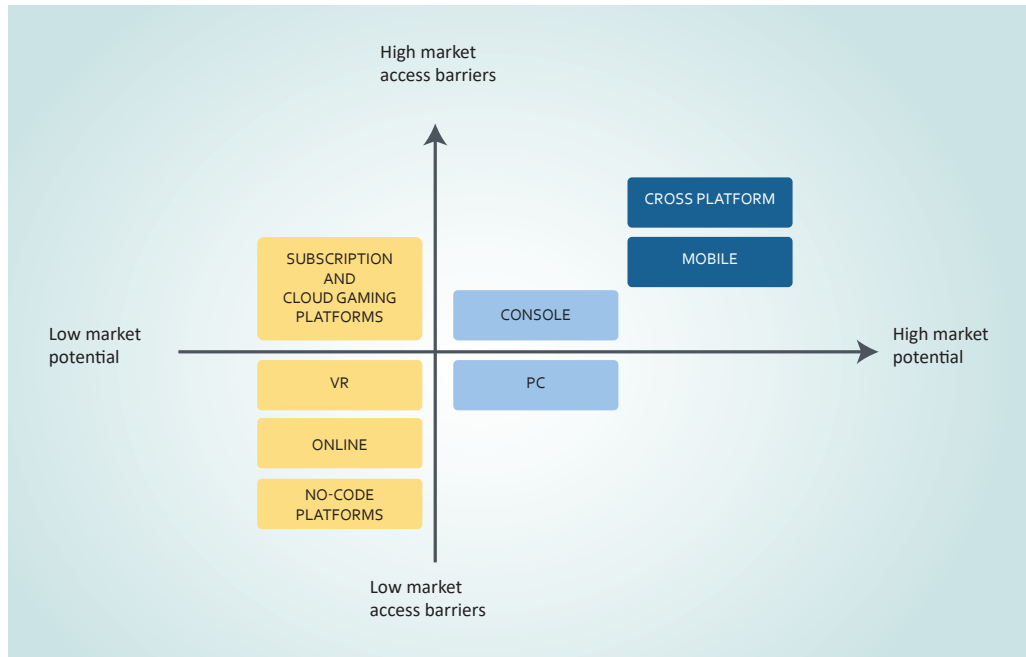
Key challenges:

- **Regulatory market access barriers:** Poor access to information on local rules globally, especially in the EU digital single market area, creates regulatory market access barriers.
- **Regulatory uncertainty:** Regulatory uncertainty on the implementation of novel technologies.



3.2. KEY MARKET SEGMENT TRENDS

Below, you can find a general description of key game market segments. Their specific challenges are discussed in detail in the following chapter.



Mobile markets

In Western markets (North America, Latin America and Europe), mobile games' main and only major (95%)²³ distribution channels are **Google Playstore** and **Apple Appstore**. In Japan and South Korea, those are the primary channels as well. In China, however, there is no Google Playstore but many different Android stores to download mobile games. Furthermore, China requires local partners and government approval to publish games.

The market potential for mobile is very good. Mobile players generate the highest share of revenues (49%) and most (75%) of the players globally play games on mobile platforms.²⁴ However, more than half of mobile players play also on other platforms.

Mobile dominance might be threatened by 2026 due to changes in privacy regulations across the globe hindering mobile marketing.

Key challenges:

- **Market access barriers are extremely high on mobile.** Due to the massive number of games published daily on mobile distribution channels, visibility and discoverability in the market usually requires a significant investment in marketing. Apple Appstore and Google Playstore typically take 30% commission from developers. In theory, this could mean 70% revenue share goes to developers. However, this is not usually the case. Developers must invest in marketing (user acquisition), which can be executed directly by the developer or in cooperation with, i.e., the publisher, which will take their share too. Because of heavy competition between game companies and changes in privacy legislation, the prices of user acquisition have been rising significantly. For the developer, that means smaller shares of the game revenues. However, from a revenue point of view, mobile is the biggest (just under half of the entire global market) segment by revenue.²⁵
- **Very poor access to data:** In mobile, IDFA (identifier for advertisers introduced) rules introduced in 2021 have dramatically limited the ability to collect data from user behaviour on Apple devices, although IDFA also protects users' privacy. It has made personalized marketing and content creation trickier, and user acquisition is drastically less effective. Bigger marketing budgets are required.

²³) Business of Apps: App Store Data (2023). Available in: <https://www.businessofapps.com/data/app-stores/>

²⁴) Newzoo's Global Gamer Study: How consumers engage with video games today. Available in:

<https://newzoo.com/resources/trend-reports/global-gamer-study-free-report-2023>

Newzoo: Global Games Market Report 2023 August 2023. Available in:

<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

²⁵) Newzoo: Global Games Market Report 2023 August 2023. Available in:

<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

Console markets

Console games are defined as games played on a TV screen directly or through a console, such as Xbox, PlayStation, and Nintendo, or on handheld devices, such as a Nintendo DS or PS Vita.²⁶ All the consoles have their own digital distribution channels, but games can be bought from the retail market as physical copies too.

The market potential of console game markets is good. Console revenues (share 30%) will have the biggest growth, +7,4% year-on-year in 2023, partly due to underperformance in 2022 and delays in game releases due to the Corona pandemic. Consoles (all together) are the third most popular (41%) platform among players, generating 30% of the revenues of the global game market.²⁷

Key challenges:

- **Poor freedom to conduct business:** Console game platforms are restricting the use of third-party tools (e.g. third-party game analytics tools and payment solutions). Furthermore, in-game advertisement is currently not possible in console games.
- **High market access barriers:** The game developer needs to have a specific proprietary (i.e. Sony Play Station) devkit enabling them to develop games for that platform. Nowadays, many developers use commercial engines like Unreal Engine or Unity, which enables porting/releasing games to different platforms quite well. However, the differences in the user interface need to be considered since mobile touchscreen controls differ significantly from console controls.
- **Modest freedom to choose distribution channels:** Sometimes, console manufacturers require an exclusivity deal for publishing games on their platform.
- **Poor access to data:** Console platforms restrict access to player data.

PC markets

The biggest distribution channels for PC games are Steam (by Valve), Xbox (for PC), Epic Games Store, COG, Humble Bundle and itch.io. Mobile and console, channels can take 30% of the game revenue., However, Epic offers a 0% fee for an exclusive release on the platform for the first six months.²⁸

The market potential of PC game markets is sizable. Downloaded and boxed PC games represent 20% of the global games market revenue, but 43% of players play PC games.²⁹

Key challenges:

- **Modest market access barriers:** As with consoles, also in PC games, the share of premium (games that must be paid upfront) business model has been decreasing from 2015-2019. Meanwhile, the free-to-play model is becoming more popular. There are limits on how high the price of a single game can be raised and how many units can be sold, with development costs needing to be covered. The transfer towards the free-to-play model seems to have stabilized since 2020. DLC and expansion packs are generating additional revenues for PC developers.³⁰ In addition, in-game advertising (generating revenues for developers) is entering PC and console games.³¹

26) Newzoo's Global Gamer Study: How consumers engage with video games today. Available in: <https://newzoo.com/resources/trend-reports/global-gamer-study-free-report-2023>

27) Newzoo's Global Gamer Study: How consumers engage with video games today. Available in: <https://newzoo.com/resources/trend-reports/global-gamer-study-free-report-2023>
Newzoo: Global Games Market Report 2023 August 2023. Available in: <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

28) TechCrunch Epic's First Run offers 100% revenue share to game devs in exchange for exclusivity. Available in: <https://techcrunch.com/2023/08/23/epics-first-run-offers-100-revenue-share-to-game-devs-in-exchange-for-exclusivity/>

29) Newzoo's Global Gamer Study: How consumers engage with video games today. Available in: <https://newzoo.com/resources/trend-reports/global-gamer-study-free-report-2023>
Newzoo: Global Games Market Report 2023 August 2023. Available in: <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

30) Newzoo: Global Games Market Report 2023 August 2023. Available in: <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

31) Newzoo: PC & Console Gaming Report 2023. Available in: <https://newzoo.com/resources/trend-reports/pc-console-gaming-report-2023>

Online markets

Online browser games used to be a more significant game distribution channel. However, currently they are viewed as a quite marginal platform. It is extremely difficult to be discovered on the internet as a standalone website. Conversely, online games face no restrictions for their business models or third-party tools, making them a particularly attractive distribution medium, for example, the Play & Earn games banned on many other distribution platforms.

Key challenges:

- **Poor market potential:** Online games are currently a small market segment.

VR markets

The definition of the metaverse is still unclear, but it is often described as an umbrella term or combinations of the following;

- **Virtual reality (VR)** - VR headsets allow users to immerse themselves in a virtual world.
- **Augmented reality (AR)** - AR technology overlays digital content onto the real world.
- **Mixed reality (MR)** - MR headsets combine VR and AR.

In August 2023, Apple announced their coming headset, Vision Pro. The release date is expected to be early 2024. Existing big manufacturers are currently, ie. Valve, PlayStation, Meta and Samsung. VR games are typically distributed from channels/stores like: Meta Quest Store, Steam, Epic Store and the PlayStation Store.

The VR consumer market potential is currently poor. VR games saw a resurgence during the lockdowns of the pandemic, and according to Newzoo³², growth has continued steadily. VR Game revenue grew from 2022 \$1,8B to 2023 \$2.5B. Growth of CAGR (compound annual growth rate) in 2019-2024 is expected to be 44%. The VR install base is growing faster than ever before. The VR ecosystem is heavily dependent on headset manufacturers. However, technological quality features are essential, and the prices of the headsets define the market size. The market size establishes game developers' interest in creating games, and if the content/games available for players are limited, it decreases players' interest in buying devices.

Key challenges:

- **Poor market potential:** VR games are still a small market segment.
- **Poor freedom to conduct business:** VR platforms are restricting the use of third-party tools (e.g., game analytics tools and payment solutions). Furthermore, in-game advertisement in VR is still rare.
- **Modest market access barriers:** Sometimes, VR platforms require exclusivity deals. Furthermore, platforms can be very selective on the projects they allow to be published on the platforms.
- **Restrictions on third-party payment systems:** Usually, VR game developers must use the payment systems provided by the platform if in-game purchases are allowed at all.
- **Poor access to data:** VR platforms restrict access to player data.

Zero code platforms markets

Leading zero code platforms are Roblox, Fortnite, and Minecraft, which offer great gateways to learning and conducting game development.

Even if players can make revenue by developing games on those platforms, it is more often a hobby than a business. However, it provides a good understanding of game development principles, i.e. user retention and engagement. Fortnite, offers engagement payouts of 40% of the net revenue from Fortnite's Item Shop and most real-money purchases.³³ Roblox's model is less profitable for developers, offering only a 25/75 split percentage from games created.³⁴ Despite that, from a player/developer point of view, game development on these platforms is not likely to be a profitable business.

³²) Newzoo: Trend report 2022 / VR Games Market Report: An Overview and Outlook of Virtual Reality in Games and Beyond. Available in: <https://newzoo.com/resources/trend-reports/vr-games-market-report>

³³) Epic: Island Creator / Engagement Payout. Available in: <https://create.fortnite.com/island-creator/overview>

³⁴) Ixie: Roblox for game development: Pros, Cons & Future. Available in: <https://www.ixiegaming.com/blog/roblox-for-game-development-pros-and-cons/>

Key challenges:

- **Very poor freedom to conduct business:** No-code game platforms usually do not allow the use of third-party tools (e.g. third-party game analytics tools and payment solutions).
- **Very poor freedom to choose distribution channels:** Porting games from non-coding platforms to other platforms is exceptionally challenging.
- **Modest control of the IP:** In no-code platforms, creators typically own the IP developed³⁵.
- **Poor access to the player community:** No-code platforms often restrict the ways game developers can communicate with their player community in the game.
- **Very poor access to data:** No-code platforms restrict access to player data.

³⁵) Shnoco: Who Really Owns Your No-Code Creations? Unraveling the IP Ownership Puzzle for Entrepreneurs: Available in: <https://www.shno.co/blog/ip-ownership-in-no-code-development>



Subscription and cloud game platforms

Cloud gaming services are subscription-based and provided e.g. by Xbox / Game Pass Ultimate, PlayStation / Plus Premium, Nvidia / GeForce Now and Amazon Luna.

The market potential of subscription and cloud games is modest for game developers. Newzoo defines cloud games as games that can be played on any device without owning the physical hardware required to process it or needing a local copy of the game itself.³⁶ Although the sales at console platforms have been rising, especially in 2023, partly due to hardware and major game title delays in 2022,³⁷ developers are worried about the current subscription trend as game passes are decreasing developer earnings. Some developers say that players would rather wait for a game to become a game pass subscription than buy it separately. For game developers, this means smaller incomes.

Key challenges:

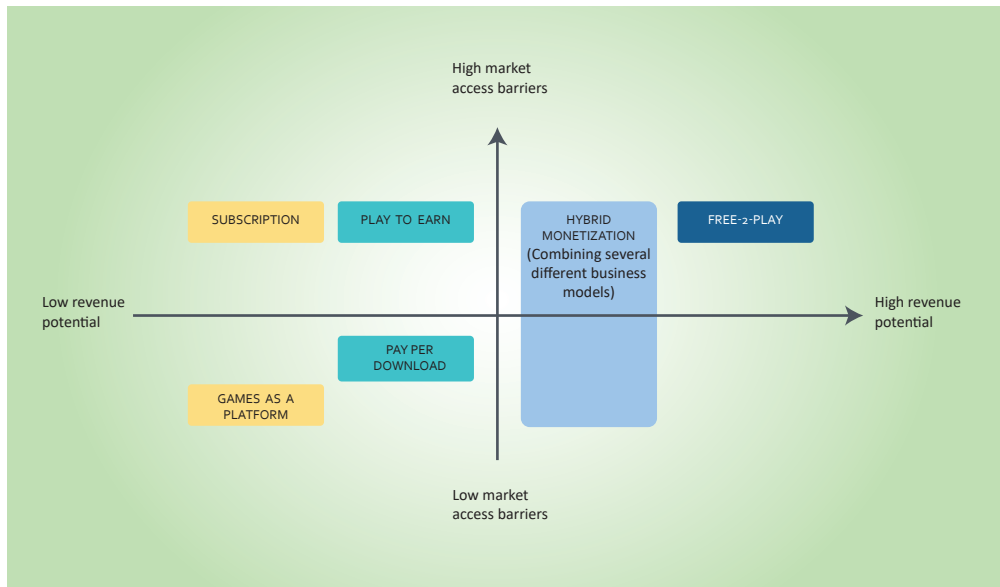
- **Modest market potential:** The market potential of subscription and cloud games is modest for game developers.
- **Very poor freedom to conduct business:** Subscription and cloud services game platforms do not allow the use of third-party tools (e.g. third-party game analytics tools and payment solutions) and often set significant limitations on business models game developers are allowed to use.
- **High market access barriers:** The more the cloud and subscription services compete on new content, the lower the market access barriers will be. Transition into cloud gaming is one of the trends expected to have high future growth. Cloud gaming would be a natural next step for gaming anywhere with any device. Despite the high hopes, the evolution is not happening as expected. Quality cloud gaming requires good mobile 5G infrastructure, which is still not available everywhere. In cloud-enabled PC or console game extensions, different user interfaces and controls often cause problems when players continue gameplay from a specific console game to a mobile device via the cloud. The player experience on a cloud platform without controls, i.e. on a mobile device, does not always feel as smooth. In addition, the graphics quality does not always meet the expectations in cloud extensions of the console games. Still, cloud-native games that have been originally developed for cloud platforms seem to have a brighter future.
- **Poor freedom to choose distribution channels:** Especially subscription-based game platforms often require game developers to grant exclusive rights to the game.
- **Very Poor access to the player community:** Subscription and cloud platforms often restrict the ways game developers can communicate with their player community in the game.
- **Very poor access to data:** Subscription platforms restrict access to player data.

³⁶) Newzoo: Global Games Market Report 2023 August 2023. Available in:
<https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

³⁷) Newzoo: PC & Console Gaming Report 2023. Available in:
<https://newzoo.com/resources/trend-reports/pc-console-gaming-report-2023>

3.3. KEY BUSINESS MODEL TRENDS

Below, different business models are introduced. However, game revenue can also consist of different combinations of business- and monetization models or even include them all (hybrid monetization).



Premium games – games as a product

Premium games are paid upfront before downloading. The premium business model is the original business model in digital distribution. However, the line between premium products and services is no longer clear. Nowadays, premium games can have a long life cycle, especially on the PC and console side. Developers can provide more playable content for players in the form of downloadable content purchased through digital stores (DLC) and extension packs and continue to gain revenue with same game or same game IP for years. Therefore, these games can be described being closer to a service model. Still, there is a transition towards the free-to-play model on PC and console games, due to decreasing revenues of premium games. The popularity of live services is growing on the console side, accounting for 27% of console revenues globally. On mobile platforms, premium games represent only a tiny niche.³⁸

Key challenges:

- **One-time payment does not bring long-term revenue like games as a service-model.**
- **Production costs and consumer expectations of high-end AAA games are constantly increasing.**

Games as a service and free to play (IAP & Advertisements)

Free to play (F2P), also described as free to download is the dominating business model and largest revenue generator for mobile. It is also becoming more common on other platforms. A player can (but doesn't have to) buy in-app purchases (IAP) integrated into game mechanics.

F2P games are services where player engagement and retention are essential, and players are attracted to return to the game repeatedly to spend more. This service-based business model makes the game revenue scalable and attractive for VC funding.

Key challenges:

- **Games as a service model requires significant marketing resources** to secure a steady flow of new players.
- **Tightening privacy requirements** (e.g. Apple iOS14 changes IDFA) have made in-game advertisements less impactful and thus less attractive as business models.

³⁸) Newzoo: Global Games Market Report 2023 August 2023. Available in: <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>
Business of Apps; App Store Data (2023). Available in: <https://www.businessofapps.com/data/app-stores/>

Subscription model

The subscription model is based on a regular pre-determined fee for a specific period. The paid fee provides players with access to a service where game content included in the plan can be played.

The following platforms offer subscription-based services: Apple / Arcade, Google / Play Pass, Netflix Games, Xbox / Game Pass, PlayStation / Plus different services, and Nintendo Switch Online. In addition, there are several game streaming services like: Nvidia GeForce Now, Amazon Luna, Humble Choice, EA Play and Ubisoft Plus.³⁹

At the same time, many mobile F2P game developers are experimenting with so-called season passes that provide extra content in the game for a specific time.

Key Challenges:

- From the content provider's view, **a subscription model on a game streaming platform is not often the most profitable choice**. It might require exclusivity, and players can postpone purchasing the game while waiting for it to come in the subscription service. For game developers, individual purchases are typically more profitable.

Game as a platform – Roblox, Fortnite and Minecraft

Some games can act as a platform for players to create their own games. For example, Roblox, Fortnite and Minecraft are platforms that provide the tools and resources that players/developers need to create their own games or new versions or layers in existing games.

Key challenges:

- **Building a platform that attracts a significant player base is exceptionally challenging.**

Play-and-earn / Play-to-earn

Play-to-earn games allow players to earn real-world rewards, such as cryptocurrencies or NFTs (non-fungible tokens), which can be utilized inside the game or sometimes in other games, traded or cashed out through a cryptocurrency wallet. The list of most popular play-to-earn games is constantly changing. In September 2023, Dappradar⁴⁰ evaluated the following games on top 4: [My Neighbor Alice](#), [Wreck League](#), [Tearing Spaces](#), and [Champions Arena](#).

Play-to-earn games are built on Web3. It allows the use of NFTs, unique and original digital assets representing in-game items, such as characters, weapons and other assets. NFTs can be bought, sold, and traded, which gives players more control over their in-game assets.

Key Challenges:

- **Play to earn is merely an opportunity for individual players to earn money instead of a business for game developer companies**. Since the revenues are shared with developers, it is questionable whether the developer's share is enough for a profitable long-term business.
- **There is significant regulatory uncertainty around the model.**

³⁹) Wired: The Ultimate Guide to Game Subscription Services. Available in: <https://www.wired.com/story/best-game-subscriptions/>

⁴⁰) Dappradar: Top 10 Best Play-to-Earn Web3 games. Available in: <https://dappradar.com/blog/best-play-to-earn-crypto-nft-games>

Game franchises

Since the game physical retail space has changed mainly to digital distribution, manufacturing, transport/delivery, and storage, costs have been removed from game production. Some physical copies of games are still sold, but primarily for collectors. Special editions of physical games can have add-ons like art books, soundtracks, etc. Game franchises can also consist of merchandise, such as toys, clothing, and other collectable items. Sometimes, they are sold as part of crowd-funding campaigns to finance a game and sometimes as a stand-alone product. Often, merchandise as a stand-alone product is done in cooperation with other partners who can agree on licensing IP with the game developer. Some of the most successful video game franchises can generate a significant amount of revenue.⁴¹

Key Challenges:

- Building IP strong enough to sell merchandise based on brand equity is extremely difficult.

⁴¹) Game Rant: The 10 Best-Selling Video Game Franchises of All Time, Ranked. Available in: <https://gamerant.com/biggest-best-selling-video-game-franchises-most-popular/>





4. EIT CCSI ACTION POINTS

4.1. HELP EUROPEAN GAME DEVELOPERS TO EXPLOIT EMERGING OPPORTUNITIES AND DISRUPTIONS

The last major disruption in the game industry value chain was when digital distribution emerged on PC and console markets starting in 2003, then later in 2008, when mobile application stores appeared on mobile devices.

Between 2016 and 2018, there were high expectations towards games expanding to XR (Extended Reality) platforms, but those expectations did not materialize. Now, XR is slowly making its second coming, probably as part of the Metaverse. In 2021, there was hype about blockchain technology and NFTs, which seems to have faded by now.

Consolidation and heavy competition make it hard for new start-up companies to enter an already saturated market. The next disruption to shake these stagnated value chain positions would be most welcomed for small developers. Disruptions can be seen as an opportunity for new and midsize startups, which might be more agile and confident to seize new opportunities that disruptions offer. Now, when the AI trend is gaining popularity, it might prove to be the second industrialization in all industries.

AI – cut the costs

Game developers see AI tools as an excellent opportunity to accelerate game productions and run larger more complex productions with similar sized development teams. Conversely, AI-driven tools come with several risks: the copyright framework for AI-generated content is unclear, platforms might remove AI-generated content due to legal risks, AI tools might lead to layoffs at game development studios. AI-generated content can also be similar to each other, and editability of generated content is not (yet) easy. Sometimes, the player community might turn against games using AI-generated content.

AI can support game productions from management, communication, and marketing to actual game development. In game development, AI can be utilized, e.g., in quality assurance, optimizing player experience, innovating, concept design, writing stories, coding, level design, game mechanics, and generating content in general. It can significantly boost many laborious duties in game development and make game development more efficient, enabling savings on development costs in bigger productions.

In the game industry the consensus seems to be that AI is still incapable of creating coherent gameplay experiences and human interaction by itself.

For more information on the use of AI in game developer studios, please see Annex 3.

UGC – Be the platform

Due to heavy competition and game market consolidation, developers have been eager to find other entry models. Creating platforms for players to generate content and even games of their own have become an option for some developers. *Hypehype*⁴² and *Yahaha*⁴³ are examples of new type platforms that let users play and create games with several different platforms. *Bitmagic*⁴⁴ is an example of a platform that enables prompt-based AI-driven user-generated content.

User-generated content (UGC) is potentially an effective way to engage players and boost organic growth, as players enjoy sharing the content they have created on social media. AI can elevate content that players are able to create on a whole new level by enabling users to create more complex content in games, or even their own games, which can accelerate the popularity of UGC (user-generated content) driven platforms i.e. Roblox, Fortnite and new platforms.

Cross-platform distribution – Diversify the risks

Cross-platform games can mean that a particular game can be played with other players simultaneously across different hardware/platforms, such as browsers, computers, consoles, mobile phones, and tablets. Furthermore, players can also continue to play seamlessly over different devices. In addition, cross-platform development can also mean that the same game is released individually to several platforms. Publishing games on several platforms enables developers to reach a wider audience, gain a more of an impact with the same marketing effort, and reduce user acquisition costs. Moreover, developers can lower the risk in general by releasing their games on several platforms. Cross-platform support requires support from a technical side so that the game engine enables porting the game to different platforms. Currently, the most popular engines, i.e. Unity 3D and Unreal Engine, have multiplatform support. The controls and user interface of the game can be a more significant challenge for gameplay. Controls on mobile game touch screens are quite different from console games.

Web3 – Be a forerunner

Web3 games are based on blockchain technology and include cryptocurrency in-game transactions, which means they are decentralized and transparent, giving players ownership of their in-game assets. This is explained further in the Play-to-Earn chapter.

Recommended EIT CCSI actions

EIT should introduce support instruments for exploring new opportunities and disruptions: AI, User Generated Content, use of third-party payment systems and introduction of third-party application stores enabled by DMA, Web3, no-code platforms.

⁴²) HypeHype website: <https://www.hypehype.com/announcement>

⁴³) Yahaha website: <https://yahaha.com/>

⁴⁴) Bit Magic website: <https://bitmagic.games/>



4.2. HELP GAME DEVELOPERS ENSURE THAT THEIR GAMES REACH THE EUROPEAN AUDIENCE

As discussed in the previous chapter, game developers face several challenges on different platforms.

	MOBILE	CONSOLE	PC	ONLINE	VR	NO-CODE PLATFORMS	SUBSCRIPTION AND CLOUD GAMES
Market potential	VERY GOOD	GOOD	GOOD	POOR	POOR	POOR	MODEST
Freedom to conduct business:	GOOD	POOR	VERY GOOD	VERY GOOD	POOR	VERY POOR	VERY POOR
Market access barriers	VERY HIGH	HIGH	MODEST	LOW	MODEST	VERY LOW	HIGH
Freedom to choose distribution channels	VERY GOOD	MODEST	VERY GOOD	VERY GOOD	GOOD	VERY POOR	POOR
Freedom to make artistic decisions	HIGH	HIGH	VERY HIGH	VERY HIGH	HIGH	HIGH	HIGH
Control over IP	GOOD	GOOD	GOOD	GOOD	GOOD	MODEST	GOOD
Access to the player community	VERY GOOD	HIGH	VERY GOOD	VERY GOOD	GOOD	POOR	VERY POOR
Access to data	VERY GOOD	POOR	VERY GOOD	VERY GOOD	POOR	VERY POOR	VERY POOR

* Likely to change due to new EU regulation allowing the use of third-party payment systems on gatekeeper platforms.

Strengthen the freedom to conduct business

On PC and mobile platforms, game developers can freely choose their service providers (e.g., analytic tools, payment systems (after DMA), and advertisement channels). Console game developers cannot choose their service providers freely, but they have relative freedom to choose their business models. The freedom to choose third-party service providers and business models is very poor in subscription, cloud and no-code platforms.

Restrictions for third-party payment channels force game developers to accept unreasonably high, “platform tax” for their in-game payments. Furthermore, in emerging markets, they might force part of the potential audience out of the market as they do not necessarily have access to the most used payment solutions (e.g. international credit cards). Similarly, restrictions on access to other third-party game development tools (e.g. game analytic tools) set limitations for game design (e.g. player data-driven game design). Some business models are not enabled at all (e.g. advertisement-based business models). These challenges set significant limitations in the freedom to conduct business.

Luckily, the upcoming implementation of the Digital Markets Act will improve access to player data on gatekeeper platforms and allow both the use of third-party payment systems and third-party distribution channels.

Currently, game development is becoming very consolidated. There are no clear borders between tools, which means many game development tools can overlap in several different areas of production. Most developers are utilizing Unreal or Unity 3D game engines. Unity provides game analytics and advertisement services. Developers are very dependent on the chosen game engine because it is practically impossible to change it afterwards. The dependency from a third-party giant technology providers puts the developer in a vulnerable position. This was witnessed when Unity introduced its new fee policy for developers in September 2023.⁴⁵

⁴⁵) BBC: Unity engine maker says sorry after runtime fee price plan backlash. Available in: <https://www.bbc.com/news/newsbeat-66810296>

Help to overcome market access barriers and secure the freedom to choose distribution channels.

The more platforms compete on new content, the lower the market access barriers are. From a game developer's perspective, cross-platform game development provides good opportunities for diversifying risks, but it is hindered by technological challenges in porting games from one platform to another and is forced into exclusivity deals required by some platforms. Furthermore, due to market saturation on the most popular platforms, discoverability can be a major issue.

Secure control of the IP

Immaterial property (IP), such as copyrights, trademarks and so on, is increasingly valuable in a saturated market where user acquisition costs are rising rapidly. It can also bring revenue for its owner by licensing. Game developers can also license popular/strong IPs of the other owner and even outside of the game industry and utilize an already existing fanbase. An option for game developers is to sell their IP instead of the whole company, as Kitka Games did with Stumble Guys.⁴⁶ Nevertheless, game developers must carefully protect and trademark their IPs to utilize them in their business.

Nowadays, distribution platforms rarely ask a game developer to transfer their IP rights to them.

Secure access to the player community

No-code platforms, consoles, VR, and subscription-based cloud gaming platforms are restricting the methods game developers can communicate with their player community.

A solid game community in a game or game series supports organic growth and user acquisition, as users share their game experiences, gameplay and, in some cases, their in-game content outside the game. Already existing fans of a game are often eager to play new games from the same developer. Social interaction can enhance player experience and improve engagement and user retention.

Secure access to player data

Analysing gameplay and players' behaviour gives valuable information for game development. It can help segment players into specific groups, which makes it possible to personalize and align the game with their preferences, based i.e. AB testing. That is the core to data-driven design.

No-code platforms, consoles, VR, and subscription-based cloud gaming platforms are restricting access to player data. On mobile, IDFA (identifier for advertisers) regulation has dramatically limited the ability to collect data from user behaviour on Apple devices, although it naturally protects users' privacy. This regulation has made personalized marketing and content creation trickier, and due to that, user acquisition is drastically less effective, which means bigger budgets for marketing are required.

Recommended EIT CCSI actions

EIT CCSI should

- **Support game developers in strengthening their position in the game industry value chain** by helping them fully explore the market opportunities brought by the Digital Markets Act: better access to data, third-party payment tools and alternative distribution channels.
- **Encourage the development of European alternatives of key game industry technologies:** (open source) game engines and add-ons or features on existing (open source) game engines, allowing games to be easily ported from one platform to another, advertisement networks controlled by game industry actors.
- **Experiment with support instruments improving the discoverability of the European content** on key platforms (e.g. test marketing).
- **Increase awareness of game developers on the importance of registering their IPs.**

⁴⁶) Mobile Gamer Biz: Scopely has acquired Stumble Guys from Kitka Games. Available in: <https://mobilegamer.biz/scopely-has-acquired-stumble-guys-from-kitka-games/>

4.3. ENABLE THE BEST GAMES TO BE MADE IN EUROPE

Support artistic excellence

Games are the forerunner of digital artistic content. Games are at the crossroads of several artistic fields: audiovisual (e.g. film and animation), artistic (textures, images), and audio (music, game audio) excellence in all is needed to make a successful game. This means that game developer studios need a wide range of artistic professionals: audio artists such as sound designers and game composers, game artists including character artists, animators, concept artists, UI artists and designers, environmental artists, technical artists, narrative designers, level designers and gameplay designers.

Artistic content is a driver of technological innovation in the games industry, not vice versa. Ever-increasing artistic requirements are pushing the game industry to test the limits of the currently available end-user devices.

TYPE OF TALENT AND EDUCATION ENABLING EXCELLENCE:	Artistic degrees
KEY ENABLING TECHNOLOGIES:	Graphic design and creation tools; 2D graphics and textures (i.e. Adobe Photoshop and -Illustration), 3D modelling + animation and rendering tools (i.e. Blender, Autodesk). For audio, sound and music tools (i.e. Wwise, FMOD, Fabric)
TYPE OF PUBLIC SUPPORT:	Cultural state aid for game production.

Key challenges:

- **AI-driven content creation tools will significantly change the game content production process.** However, game developer studios are still in the early stages of identifying best practices for AI-driven content creation.
- **There is more regulatory uncertainty** (e.g. new rights for creators under new EU copyright rules and copyright framework for AI-created content) **and service provider uncertainty** (e.g. Unity pricing changes) **on the artistic production process.**

Support business excellence

Games are forerunners of new digital business models. Games introduced gift cards to make purchases in digital app stores. Online games introduced the free-to-play model. Now, free-to-play mobile games are the biggest revenue generator of the games market.⁴⁷ Changes in privacy regulation and technology service providers' fees (i.e. Unity) can hinder the growth of mobile games' global revenue. Retail sales of games are estimated to grow slightly until 2026, but overall, its revenue share is shrinking.

When estimating differences between business models, the most profitable business model may not be the best choice for every game company. The game industry needs versatility, not only big corporations and growth companies. It is possible to run a profitable business as an independent developer with traditional, not-so-scalable business models.

Business professionals needed in game developer studios include, monetization designers, business developers, game analytics, and product owners or producers.

TYPE OF TALENT AND EDUCATION ENABLING EXCELLENCE:	Business degrees
KEY ENABLING TECHNOLOGIES:	Game analytics tools
TYPE OF PUBLIC SUPPORT:	R&D aid for game productions and SME support

Key challenges:

- Game production is about developing creative, commercial products (games) for customers/markets willing to spend money on and in them. Execution depends on resources, skills, knowledge, team size and budget. Game productions require a minimum business understanding in addition to technical and artistic design expertise. **Many game developer studios have good artistic and tech talent but lack business expertise.**

⁴⁷) Newzoo: Global Games Market Report 2023 August 2023. Available in: <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

Support technological excellence

Games are leaders of technological innovation in cultural and creative sectors.

Tech talent needed in game production is not a generic programmer. Game developer studios need various technological professionals like gameplay programmers, UX/UI developers, back-end developers and tool programmers.

TYPE OF TALENT AND EDUCATION ENABLING EXCELLENCE:	Engineering degrees
KEY ENABLING TECHNOLOGIES:	A game engine that allows interaction and other functions in the game. Examples of commercial engines are Unity 3D, Unreal Engine, and Godot. Developers can also make their own engines, add more features, or modify existing ones.
TYPE OF PUBLIC SUPPORT:	R&D aid for game development

Key challenges:

- The game industry is competing with other industries for the best global tech talent. Consequently, **there is a huge talent shortage of key tech experts** like back-end server engineers, AI and machine learning experts, and experienced tech leads.

Recommended EIT CCSI actions

EIT CCSI should

- **Experiment with support instruments bridging the gap between cultural funding for artistic excellence and R&D funding for business and technological excellence.**
- **Support game developer studios in developing and implementing new AI-driven tools** into their production process.
- **Provide general legal guidance on identifying and overcoming key regulatory risks** (e.g. copyright-related) in digital content creation.
- **Introduce support instruments to strengthen the business expertise of game developer studios.**
- **Find ways to support game developer studios in upskilling their current tech experts.**

4.4. ENSURE THE FUNDAMENTAL FRAMEWORK CONDITIONS FOR RUNNING A GAME BUSINESS

Support access to reliable and predictable guidance on the implementation of the regulation

Increasingly fragmented global digital market regulation poses a significant threat to the European game developers success story. In the future, the European Union must focus more on building a global regulatory framework for the digital market instead of finetuning Single Market regulations. Regulatory market access barriers are becoming even more important factors.

The EU is the forerunner of game regulation. European rules for data and consumer protection and the co-regulatory PEGI system for the protection of minors set a solid framework for the protection of players in games. Meanwhile, the European regulatory framework (i.e. competition rules, platform regulation, and regulation of the data value chain) secures fair competition in Europe's game industry's value chain.

In upcoming years, the Digital Markets Act, Digital Service Act and Data Act will restructure the value chain of the EU game industry, bringing new opportunities and regulatory challenges to the European game industry. The EU is preparing for the next parliamentary term. The Digital Fairness Initiative will likely introduce a new wave of consumer protection rules by the end of the decade. Before their introduction, the ePrivacy directive and AI regulation act might change how games are developed in the EU.

EU state aid rules create an artificial barrier between, cultural funding for game production, R&D funding for technology and business development, and SME funding, boosting the creation of new game developer studios and the growth of companies. Private funding for game development is subject to complex sustainability reporting rules, and national immigration rules create significant challenges for attracting and relocating the best global talent in the EU and enabling cross-border remote work.

Due to the ever-increasing regulation of game markets, regulation is becoming an increasingly important market access barrier for game industry SMEs. The challenges SMEs face is not always linked with the EU regulation itself, but the lack of game industry-specific guidance on its implementation and ways to access local rules and practices in different EU member states. Stricter privacy rules significantly hinder the marketing and discoverability of European games.

Since European companies are competing in the global market, they must consider the regulations of different market areas. This adds complexity to all their activities and highlights the importance of the EU single market ideal.



According to EGDF⁴⁸, the main challenges related to implementing and enforcing the regulation are the following.

Key challenges related to the implementation of legislation:

- **Lack of mainstreaming digital growth:** The role of authorities promoting digital growth and innovations in implementing regulation must be as strong as that of tax, consumer, and data protection authorities.
- **Lack of reliability:** The conflicting interpretations national authorities propose for how the outdated legislation should be applied to new innovations threaten Single Market uniformity. For this reason, authorities' interpretations must be increasingly coordinated at an EU-wide level.
- **Lack of access to regulation:** All acts, guidelines and court rulings concerning digital content creation must be available in a single European portal in all official languages of the EU.

Support access to peer support and knowledge sharing across communities

Game developers' communities can support game development significantly. It can be a peer support framework for sharing knowledge and relevant contacts, helping teams evaluate their games and game development processes, and give emotional support and empowerment. In Finland, there is practically no domestic market and for that reason, no competition between game companies. Therefore, a strong community is one of the cornerstones of the success of the local game industry.

Trade missions to international conferences and seminars often play a vital role in mapping emerging industry trends. Game developer studios should be more closely involved in trade promotion programs and trade missions abroad by government representatives. Unfortunately, SMEs usually don't have the funding to participate in professional industry events; thus, public financing of activities of this kind is crucial.

Key challenges:

- **SME game developer studios are struggling to secure resources to join key game industry events.**
- **Due to the lack of well-resourced cluster organisations,** it is challenging to build and maintain local game dev communities.

⁴⁸) Building functional digital single market area:
<https://www.egdf.eu/documentation/5-fair-digital-markets/building-a-functional-digital-market-area-2/>

Support access to talent

The game industry is generally suffering from a lack of talent. Game companies nowadays often have a vast range of positions, much more than just graphics and coding. Roughly, those can be divided into three segments;

1. Actual game development
2. Business
3. Supportive actions

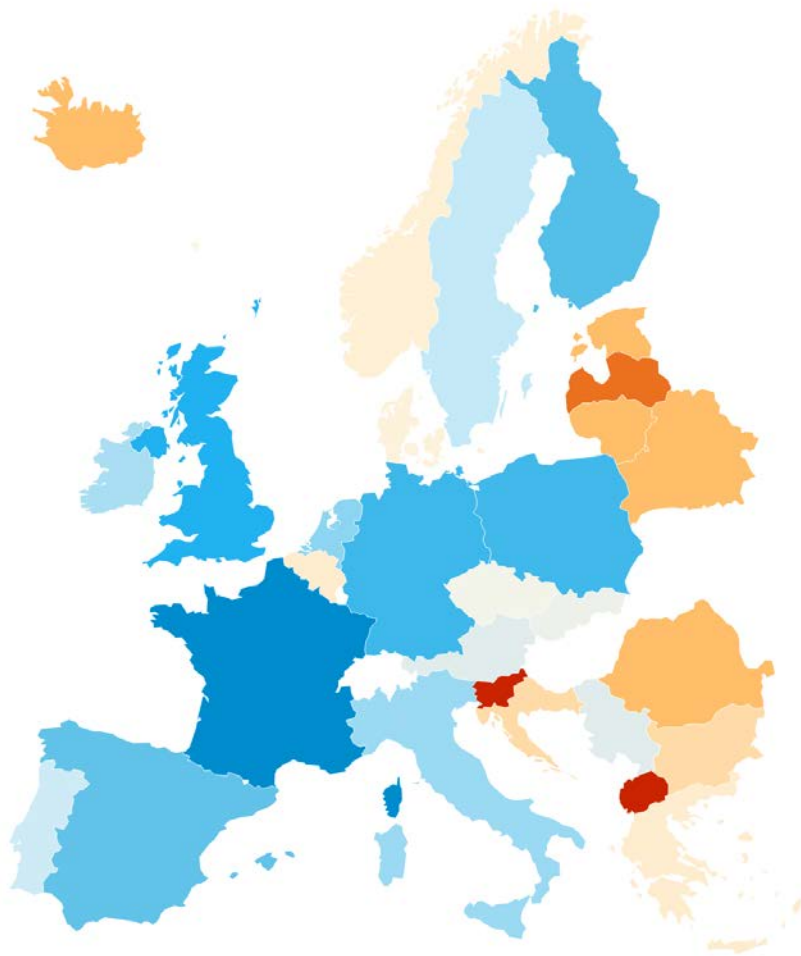
All these segments overlap with each other. Actual game development consists of; product management, arts, design, graphics, animation, and, on the technical side, the use of the game engine, software architecture, back and front-end programming. The business includes; marketing, studio management, financials, business plans, and negotiations with partners, publishers, and investors. Supportive actions include; community management, analytics and metrics, human resources, and quality assurance.

Even though hard skills are essential in the game industry, soft skills like team building are just as important. If a person fails to integrate into a team or the team fails to cooperate smoothly, the whole game development is at risk. Without rudimentary social skills, it becomes challenging to advise or be advised by others. Team skills do not mean that person needs to be extroverted, but they should be able to communicate, provide and receive constructive criticism, and mutually respect each other.



Game education

Formal Game Education institutes in Europe (2021)



Created with Datawrapper

The EU is one of the global leaders of professional game education. However, there are significant differences on the availability of the professional game education between the EU member states, as can be seen from the map above.

When the game audience and whole entertainment environments are changing, young talents are often those who have a genuine understanding of the new reality. This can be a very valuable asset for many developers. Rapid evolution means that everyone must learn new skills. From that perspective, juniors can be starting without the burden of knowing how things have “always” been done.

Key challenges:

- **Companies don't prefer to hire interns** due to the time constraints on senior employees to guide them.
- **The game industry might not be as attractive for juniors**, so there are fewer applicants for game development education, fewer graduates, and potentially lower quality candidates.
- **The gap between schools and workplaces is often huge.** The skills required in companies don't always match the skills that the available talent has. The game industry is changing rapidly, and it is challenging to evolve. In addition, engines which don't require extensive coding skills, have distorted the need to learn hard-core coding. Skills in basic coding languages are still needed, and necessary.
- **The poor availability of the professional game education** in some EU member states.

Attracting talent from abroad

Often, the top minds of their respective professions are only available from global job markets. The best game industry talents can choose where they prefer to work .

Key challenges:

- **Talent attraction requires active country branding**, despite its limited public support.
- Immigration bureaucracy often creates a significant barrier to entry into a country that significantly hinders the recruitment process.
- **Talent retention is a significant challenge**, especially if a spouse moving into the country does not find a job, or both experience racism or xenophobia within the country.

Remote and hybrid work

During the pandemic, remote work became the new normal for most game companies. After, many companies changed to a hybrid mode. Remote work enables talent acquisition in positions that are difficult to fill, and it is a convenient method to collect development teams based on available global talent, not only in the local job markets.

Key challenges:

- **The bureaucracy** regarding working in a country different from the studio's legal location is complex . In practice, companies need to establish a branch office in the country where hired talent is located or use the employer of a recorded company to pay salaries or outsource services bought from abroad.
- **Remote and hybrid work can sometimes cause troubles with team dynamics**, engagement, and leveraging the company culture.
- **Remote work requires more self-orientation** from an employee, which can be challenging. An increase in one's mental burden is sometimes connected with remote work. However, the flexibility of the remote work is appreciated by many.

Support access to funding

Rising private risk funding, especially for first-round game industry start-ups, is currently exceptionally challenging as game investors hesitate to make investment decisions due to global economic uncertainty. EU countries are introducing funding instruments targeted at the game industry. However, these funding instruments are constantly at the risk of budget cuts.

Key challenges related to private funding

- Investment hype to NFTs and cryptos in games stopped in the spring of 2022. From spring 2023, there have been high hopes placed on AI-based solutions. However, **a general prevailing uncertainty and unpredictability make investors hesitate**. The global game business environment is not easy for many developers. Developers who are at the end of their previous investment round failing to have solid results, find it challenging to raise capital in the next round.
- Chinese and Saudi-Arabian funding is currently available. **Global geopolitical risks cause concerns and affect investment decisions**.
- **The resources of national support instruments for equity financing are currently limited**, concerning the number of operations carried out in the video game sector. We call for a change of scale. EU-supported venture capital funds will not reach SMEs operating in emerging industries like the games industry. Investing in the games industry requires specific expertise from game markets, and often, game industry funds are relatively small.

Key challenges related to public funding:

- **Slow and unpredictable processing of public funding**
- **Lack of investment in the games sector and austerity politics cutting investment in games**

Support access to markets

Since digital distribution for PC and console games became more common and Apple and Google launched their mobile application stores in the late 00s, game developer positions in the value chain have improved dramatically. Before, operators had a significant share of mobile games and publishers on the PC and console side. On digital distribution, a platform holder's fee is typically 30% of the game revenue. Apple has dropped their percentage to 15% for games with less than one million in annual revenues.⁴⁹

While the games market's total revenues are growing, game developers' share of them has gradually declined during the last few years. New stakeholders, and different service providers (i.e., User acquisition, payment services, etc.), are appearing in the value chain and are snatching their share of the game revenue.

The Russian invasion of Ukraine led to comprehensive trade restrictions towards Russia and woke many game developers to the significant impact and consequences of geopolitical conflicts had on business.

Key challenges:

- **Trade wars and embargos:** In addition to the trade restrictions towards Russia, some developers are carefully following if tensions between the US and China will emerge. Luckily, large-scale mutual dependency makes it improbable.
- **Gatekeepers:** The EU (e.g. Digital Market Act), Japan, and South Korea are building regulations to open dominant platforms for third-party application stores and payment systems. Meanwhile, telcos and game industry service providers are trying to increase their value chain share.

Recommended EIT CCSI actions

EIT CCSI should

- **Provide access to up-to-date guidance on operating in an increasingly complex regulatory framework in the EU and more and more fragmented regulatory framework globally.**
- **Support innovation, strengthening peer support in local game dev communities and fund initiatives to enhance knowledge sharing between European game dev communities.**
- **Encourage collaboration between European trade promotion agencies** to increase European presence in the key global game industry events to attract the best global talent and companies into Europe.
- **Map local immigration rules and best practices in the EU** and map the rules for cross-border remote work in the EU.
- **Support game industry-focused European VC funds** to scale up their activities.

⁴⁹) Tech Crunch: Study says App Store revenue of small developers grew by 71% in last two years. Available in: <https://techcrunch.com/2023/05/11/study-says-app-store-revenue-of-small-developers-grew-by-71-in-last-two-years/>

5. CONCLUSIONS

5.1 THE GOAL AND MAIN BOTTLENECKS

The goal for 2030

EIT CCSI should ensure that the European game industry maintains or increases its current market share by 2040. **Turnover of the European game industry must be well over EUR 40 billion by 2030**, more than twice the size it is now. Unfortunately, Europe is losing its game industry power to the USA and China.

To reach this goal, the EIT CCSI must support actions addressing the following bottlenecks within the industry.

The main bottlenecks hindering the growth of the European games industry and potential EIT CCSI tools to address them

BOTTLENECK 1

Regulatory market access barriers: The EU is the global leader in shaping humanity's digital future through regulation. European SMEs have an opportunity to be the global leaders in exploiting the new opportunities created by the regulatory changes.

Ever-increasing regulatory uncertainty caused by the complex data protection, consumer protection, protection of minors' framework in the European digital single market area, global regulatory fragmentation, all create a significant market access barriers for SMEs.

EIT CCSI TOOLS

The goal: It should be easy and affordable for all game developers operating in Europe to access, understand and follow the European regulatory framework for making games.

Recommended EIT CCSI action: EIT CCSI should support initiatives mainstreaming information and provide guidance on essential regulatory requirements (e.g. platform regulation, IP protection, immigration rules and cross-border remote work) on publishing games in the EU digital single market area.

BOTTLENECK 2

Lack of information on new opportunities and disruptions and best practices to exploit them: As a forerunner of digital industries, the game industry is going through never-ending waves of technological, business, and artistic disruptions. The industry has the technical, business, and artistic capacity to address the challenges and changes caused by these disruptions. To keep the technological forerunner advantage in the EU, support structures are needed to mainstream information on the new opportunities (e.g. building and using AI) and support European SMEs in building novel tools and services.

EIT CCSI TOOLS

The goal: European game developers should be the first to explore emerging market opportunities and disruptions. Furthermore, they should use their technological forerunner status as their competitive advantage.

Recommended EIT CCSI action: EIT should introduce support instruments for exploring new opportunities and disruptions: AI-driven tools and production methods, User Generated Content, use of third-party payment systems and the introduction of third-party application stores enabled by DMA, Web3, and no-code platforms. EIT CCSI should encourage the development of European alternatives of key game industry technologies like game engines. EIT CCSI should help game research to work in close cooperation with the industry, building scenarios about future possibilities.

BOTTLENECK 3

Saturated game markets and challenges related to the discoverability of European games: Europe is good at creating games but weak at game distribution and publishing. Game markets are becoming increasingly saturated and consolidated in the hands of a few leading global game industry giants due to increasing market access barriers for the European game industry SMEs. Consequently, Europe imports more games than it exports.

It is no longer enough to make a great game; it is equally important to find the right distribution and marketing channels and partners for it. Often, game developers are good at making games and rely on publishers for marketing and distribution.

EIT CCSI TOOLS

The goal: It should be easy for European players to find and access European games.

Recommended EIT CCSI action: EIT CCSI should support experimentation with new support models built for test marketing and audience building in the game industry, as well as with support instruments bridging the gap between cultural funding for artistic excellence and R&D funding for business and technological excellence.

BOTTLENECK 4

Challenges related to access to talent – The European game industry is struggling with talent shortage:

The European game industry, particularly the strong game development countries, is struggling to access top global talent needed to continue its growth. In many EU member states, professional game education is underdeveloped, and local immigration rules hinder talent immigration. Meanwhile, cross-border remote work is becoming increasingly popular, but the EU lacks a clear and solid regulatory framework for it.

EIT CCSI TOOLS

The goal: Game developer studios must have access to the top talent to make the best games in the world. Thus, all EU member states should provide access to up-to-date professional game education.

Recommended EIT CCSI action: EIT CCSI should ensure that target groups are aware of education and the possibilities the game industry can offer so that professional game education becomes the most attractive career choice among the best young talents.

EIT CCSI should enable the introduction of professional game education in the low-capacity game development countries where it is lacking, support the development of business skills in the industry and support the fast introduction of new AI tools in the European game education curriculums (new curriculum) and bridging the gap between game education and the game industry. EIT CCSI should explore opportunities for building synergies through organizing shared lectures and exchanging their Open Online Courses between selected educational institutions

Furthermore, the EIT CCSI should consider supporting joint actions for attracting global talent to the EU (EU trade missions) and accessible information on and best practices for cross-border remote work in the EU.

BOTTLENECK 5

Building a sustainable game industry: Public support instruments in the EU are mapping different ways to include corporate (environmental, social, and administrative) sustainability in the eligibility criteria for public funding. Meanwhile, more and more game developer studios and game industry investments are subject to sustainability regulation.

EIT CCSI TOOLS

The goal: All European game developer studios and publishers should have access to an extensive list of sustainability tools and best practices.

Recommended EIT CCSI action: EIT CCSI should boost the development and mainstreaming of sustainable game development practices beyond environmental sustainability.

BOTTLENECK 6

Access to information and peer support: Game dev communities and their peer-support structures have not fully recovered from the pandemic. Although the pandemic was good for the game business, it was a disaster for local and national game developer communities. The market downturn that followed the pandemic has significantly decreased game industry sponsorship funding for local and national game industry events and professional communities.

The game industry should be able to cooperate with other European creative industries in digital and non-digital value chains and create new intelligent ways to utilize the strengths of different industries maximizing the impact, e.g. in brand building.

EIT CCSI TOOLS

The goal: All leading national game industry hubs in Europe should have their own cluster/community organisation, enabling and facilitating internal and external knowledge sharing.

Recommended EIT CCSI action: EIT CCSI should support European SMEs in joining leading global game industry conferences and joint country branding initiatives for talent attraction and support for national and local game dev community organizations to facilitate game industry peer support on the local level.

BOTTLENECK 7

Access to funding and support instruments enabling the industry's growth: Rapid inflation and global economic downturn have slowed the growth of the worldwide game markets and significantly increased the competition in the saturated game markets. The current market and geopolitical uncertainty have limited the investment markets in 2022 and 2023.

Consequently, access to risk capital is a considerable challenge, particularly in the low-capacity game production countries that lack local support structures like cluster organisations or game industry trade associations. In moderate-capacity game development countries, the challenge is to encourage the creation of spin-off companies from major local game development studios and help them to become scale-up companies.

EIT CCSI TOOLS

The goal: It should be a norm that major game industry exits lead to a new game industry VC fund.

Recommended EIT CCSI action: EIT CCSI should encourage the creation and increasing investment potential of national game industry-focused VC funds and encourage EU VC funds to invest in the game industry (EIT CCSI investor club). Introducing and experimenting with novel support mechanisms uniting cultural, business, SME and R&D support instruments in a unified support measure specialized for the needs of the game industry (EIT CCSI policy club) is an advisable line of action.

BOTTLENECK 8

Access to the route to the top of the value chain: The core enabling factors of the success of the European games industry has been the fact that, it has been able to secure its position on the game industry's value chain. Compared to the leading game development countries globally, the USA and China, the EU lacks its own platforms, and only a few global industry giants are based in the EU. European game developer studios are struggling with limited access to data, market access barriers, and choosing distribution channels set by key game distribution platforms that act as gatekeepers in the main game industry market segments.

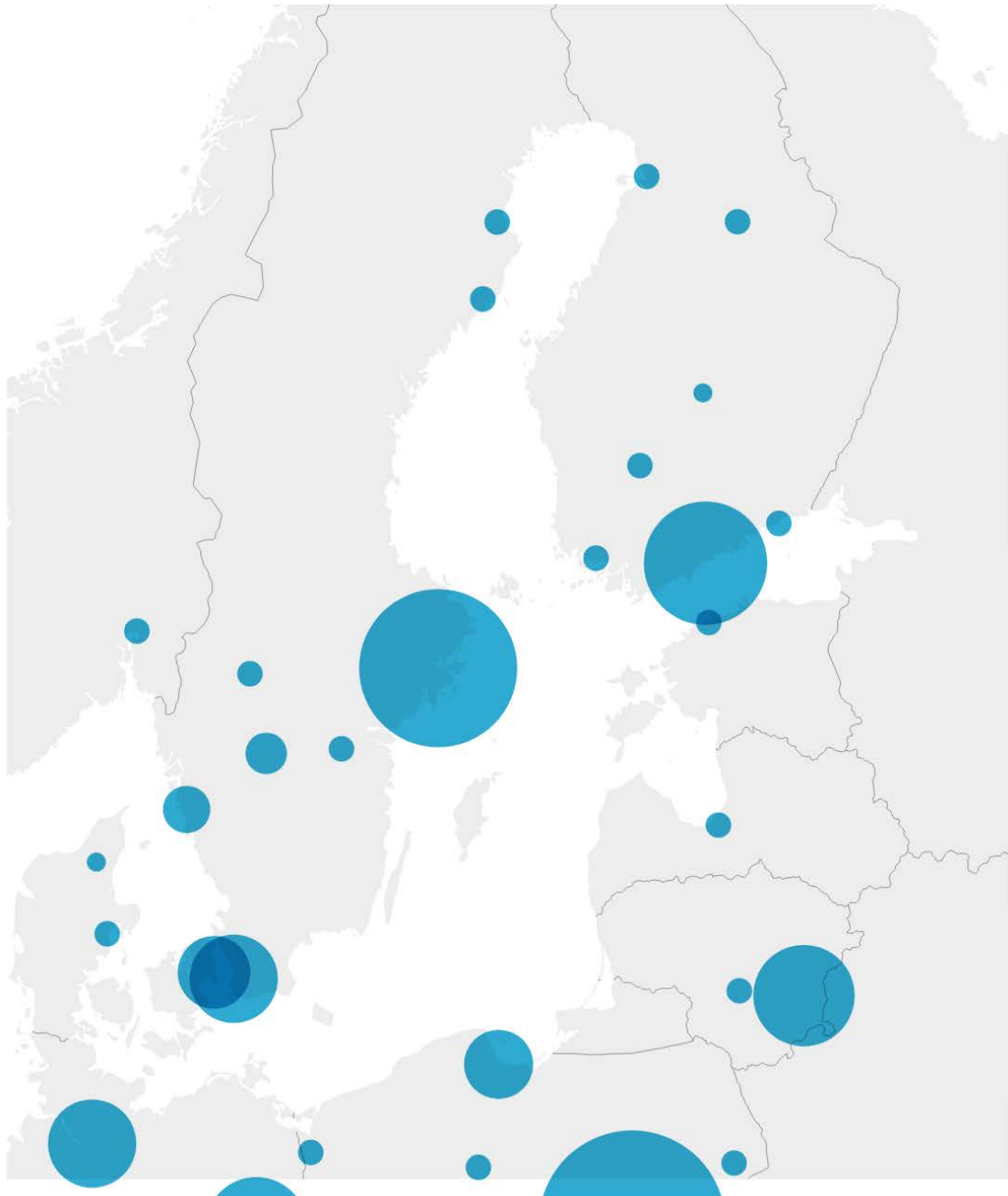
EIT CCSI TOOLS

The goal: European game industry should have a clear path to the better value chain position.

Recommended EIT CCSI action: Especially in low-capacity countries, the EIT CCSI must support the transition of the game industry from outsourcing and production companies to autonomous game developer studios focused on creating their own IPs and making their artistic, business (e.g. game development tools and services, R&D, distribution, and marketing) and administrative decisions (e.g. HR) in the studio itself. This can be done through MOOCs focused on capacity building and the introduction of support for creating game industry incubators and accelerators.

EIT CCSI should help game developer studios fully explore the market opportunities brought by the Digital Markets Act (e.g., access to data, third-party payment tools, and alternative distribution channels).

ANNEX 1: STATE OF NATIONAL GAME INDUSTRY ECOSYSTEMS AND RECOMMENDED PARTNERS



Created with Datawrapper

Figure 1: Key game industry hubs in terms of employees in the Baltic Sea region

Note: The following country data is based on information available in public sources and expert estimates by country organizations.

EIT CCSI CLC NORTH

FINLAND

Key facts (2021)

- 215 studios
- 3550 employees
- EUR 3200M combined turnover

Major game industry hubs

- **Helsinki region:** 117 studios, about 3000 employees
- **Oulu:** about 20 studios, over 100 employees
- **Tampere:** about 40 studios, over 100 employees
- **Kajaani:** 9 studios, over 100 employees
- **Turku:** 23 studios, under 100 employees
- **Kymeenlaakso region:** 9 studios, under 100 employees
- **Jyväskylä:** 15 studios, under 60 employees

Key professional game education institutions

- All in all, 37 formal and 5 formal game education institutions
- [Aalto University](#)
- [Metropolia University of Applied Sciences](#)
- [Careeria](#)
- [OSAO](#)
- [Kajaani University of Applied Sciences](#)
- [Turku University of Applied Sciences](#)
- [Sataedu](#)
- [XAMK University of Applied Sciences](#)
- [Kouvola seudun ammattiopiston](#)
- [University of Jyväskylä](#)
- [JAMK University of Applied Sciences](#)

Key game industry-focused support instruments

- [Business Finland grants and loans](#)

Private investors focused on game development

- [Sisu Game Ventures](#)
- [Nordic Game Ventures](#)
- [Play Ventures](#)

Key sustainability actions

- [Finnish Game Industry model for CO2 emissions calculations – an update](#)
- [Checklist for game studios to reduce their CO2 emission](#)

Key challenges

- Access to talent
- Securing game developers' leading role in the value chain
- Gamedev community building and peer support

Key contact and recent studies for further information

- [The Game Industry of Finland Report](#)
- ✉ [Neogames Finland / KooPee Hiltunen](#)

SWEDEN

Key facts (2021)

- 785 studios
- 7 944 employees
- EUR 2 713M turnover

Major game industry hubs (2022)

- **Stockholm region:** about 400 studios, over 5000 employees
- **Skåne:** 129 studios, over 1600 employees
 - **Malmö** about 80 studios, over 1500 employees
- **Västra Götland:** 142 studios, about 800 employees
 - **Göteborg:** about 70 studios, about 400 employees
 - **Skövde:** about 36 studios, about 300 employees
- **Öster Götland:** 60 studios, about 100 employees
 - **Norrköping/Linköping:** 60 studios, about 100 employees
- **Northern Sweden:** 84 companies, about 300 employees
 - **Skellefteå:** about 24 studios, about 100 employees
 - **Umeå:** about 27 studios, about 100 employees
- **Värmland:**
 - **Karlstad:** about 19 studios, over 100 employees

Key professional game education institutions

- All in all, 17 formal and 6 non-formal game education institutions.
- Academic institutions providing multi-discipline game education with joint game projects (programmers, artists and designers making games together)
 - [University of Skövde](#)
 - [Uppsala University](#)
- Academic institutions providing programmes in games
 - [Chalmers University of Technology](#)
 - [Blekinge Institute of Technology \(BTH\)](#)
 - [Luleå University of Technology](#)

- [Södertörn](#)
- [University of Stockholm](#)
- [University of Linköping](#)
- [University of Malmö](#)
- o Higher vocational education provides multi-discipline game education with joint game projects (programmers, artists and designers making games together)
 - [Futuregames](#)
 - [The Game Assembly \(TGA\)](#)
 - [PlaygroundSquad \(PSQ\)](#)
- o Higher vocational education providing programmes in games
 - [Forsbergs Skola](#)
 - [Nackademin](#)
 - [Yrigo](#)
 - [Visual Magic](#)

Key game industry-focused support instruments

- o **Sweden does not have cultural or R&D support instruments for the game industry, but it has several regional clusters supporting game industry SMEs.**
- o [Arctic Game cluster](#)
- o [East Sweden Game](#)
- o [The Great Journey](#)
- o [Sweden Game Arena](#)
- o [Mid Sweden Games](#)
- o [Gameport \(Blekinge Business Incubator BBI\)](#)
- o [Game Habitat](#)

Private investors focused on game development

- o [Behold Ventures](#)
- o [Nordic Game Ventures](#)
- o [MTG](#)
- o [Embracer Group](#)
- o [Stillfront](#)
- o [Raw Fury](#)
- o [EG7](#)

Key sustainability actions

- o [Nordic PlayCreateGreen initiative](#)

Key challenges

- o A huge start-up base but no public game demo / prototype funding.
- o An excellent local cluster organisation base, but all are funded by local governments. Consequently, limited access to funding, and most lack funding to run much-needed local incubators or accelerators for start-ups.
- o After the Nordic Council of Ministers stopped funding joint Nordic game industry trade missions to global industry events, Sweden has lacked a support instrument to take local companies to industry conferences and trade shows.

Key contacts and recent studies for further information

- o [Swedish Game Industry 2023](#)
- o [Dataspelbranchen](#)
- ✉ [Dataspelbranchen: Johanna Nylander](#)

NORWAY

Key facts (2021)

- o **17** studios
- o **433** employees
- o **EUR 51M** combined turnover

Major game industry hubs (2022):

- o **Oslo:** 15 studios, over 100 employees

Key professional game education institutions

- o **All in all, 6 formal education institutions.**
- o [INN](#)
- o [UIT](#)
- o [Nord University](#)
- o [Kristiania](#)
- o [Noroff](#)

Key game industry-focused support instruments

- o [NFI](#)

Key private investors focused on game development

- o [Snö VC](#)

Key game industry-focused sustainability actions

- o None

Key challenges

- o Attract investors
- o Industry/business-oriented policy and measures, alongside the cultural policy measures
- o More targeted and specialized education to answer industry needs

Key contact and recent studies for further information:

- o [Spillrapporten \(2023\)](#)
- o [Virke](#)
- ✉ [Virke: Åse Kringstad](#)

ICELAND

Key facts (2021)

- o **18** game developer studios
- o **518** employees
- o **EUR 70M** combined turnover

Major game industry hubs

- o **Reykjavik,** 18 studios, over 100 employees

Key professional game education institutions

- o **All in all 3, formal game education institutions**
- o [Keilir](#)

- [Tækniskólinn](#)
- [Reykjavík University](#)

Key game industry-focused support instruments

- None

Key private investors focused on game development

- [Crowberrycapital](#)

Key sustainability actions

- None

Key contacts for further information

- [State of Icelandic Game Industry \(2020\)](#)
- [IGI](#)
- ✉ IGI: [Þorgeir Frímann Óðinsson](#)

DENMARK

Key facts (2022)

- **163** studios
- **1281** persons employees
- **EUR 499M** combined turnover

Major game industry hubs

- **Copenhagen:** about 100 studios, about 1000 employees
- **Aarhus:** about 17 studios, about 100 employees
- **Aalborg:** about 10 studios, less than 100 employees

Key professional game education institutions

- **All in all, 7 formal and 2 non-formal game education institutions**
- [Dania Games](#)
- [Aalborg University](#)
- [ITU](#)
- [SDU](#)
- [National Film School of Denmark](#)
- [Royal Danish Academy](#)

Key game industry-focused support instruments

- [Grants for game productions and launch: DFI Spilordningen](#)

Key private investors focused on game development

- [Egmont Nordisk Games](#)
- [1Up](#)

Key challenges

- Difficulty in finding highly qualified employees
- Lack of investors who are familiar with the industry

Key sustainability actions

- **Environment:** [The Nordic Alliance for Sustainability in Gaming](#)
- **Diversity:** Good Conduct Guidelines for the Danish Games Industry

Key contact and recent studies for further information

- [State of the Nation I den danske spilbranchen \(2022\)](#)
- [Pro-F](#)
- ✉ Pro-F: [Charlotte Enevoldsen, Bjørn Rasmussen](#)

ESTONIA

Key facts (2021)

- 37 studios
- 304 employees
- EUR 37M combined turnover

Major game industry hubs

- **Tallinn:** 25 studios, over 100 employees

Key professional game education institutions

- **All in all, 3 formal and 2 non-formal game education institutions**
- [Full Cycle Academy](#)
- [CGVR Lab](#)
- [TLU Digital Learning Games](#)
- [Estonian Entrepreneurship University](#)

Key game industry-focused support instruments

- None

Key private investors focused on game development

- Estonia has many crypto-investors, but none are directly game focused

Key sustainability actions

- None

Key contacts for further information

- [Gamedev Estonia Database \(2023\)](#)
- [Gamedev Estonia](#)
- ✉ Gamedev Estonia: [Andrejs Rusinovskis](#)

LATVIA

Key facts (2021)

- **57** game developer studios
- **296** employees
- **EUR 24M** combined turnover

Major game industry hubs

- **Riga:** Over 30 studios, over 100 employees

Key professional game education institutions

- **All in all, 1 formal game education institution**
- [EKA](#)

Key game industry-focused support instruments

- None

Key private investors focused on game development

- None

Key sustainability actions

- None

Key contacts for further information

- [Latvian Game Developer Association](#)

✉ [Nauris Āboliņš](#)

LITHUANIA

Key facts (2021)

- 53 studios
- 1 097 employees
- EUR 154M combined turnover

Major game industry hubs (2023)

- Vilnius: around 60 studios, over 2000 employees
- Kaunas: around 5 studios, over 100 employees

Key professional game education institutions

- All in all, 4 formal game education institutions
- Vilnius Technical University
- Vilnius Business College
- Mykolas Romeris University
- SMK

Key game industry-focused support instruments

- None

Key private investors focused on game development

- Gamedev Fund VC

Key sustainability actions

- None

Key challenges

- Lack of public funding or other support instruments targeted to accelerate the establishment and growth of Gamedev startups
- Lack of talent in the game business development field.
- Lack of competitive investment environment

Key contact and recent studies for further information

- LZKA

✉ LZKA: [Gediminas Tarasevicius](#)

POLAND

Key facts (2021)

- 494 studios
- 15 290 employees
- EUR 1 286M combined turnover

Major game industry hubs

- Warsaw: 157 studios, roughly 7000 employees
- Wrocław: 45 studios, roughly 2000 employees
- Krakow: 80 studios, roughly 1400 employees
- Tricity agglomeration (Gdansk, Gdynia, Sopot): around 12 studios, around 900 employees

- Silesia agglomeration (Katowice, Gliwice, Chorzów): around 30 studios, over 700 employees
- Lodz: 30 studios, over 250 employees
- Poznan: 20 studios, over 100 employees
- Bydgoszcz: over 10 studios, over 300 employees
- Bydgoszcz: over 10 studios, over 100 employees

Some key professional game education institutions

- All in all, 50 formal game education institutions
- The Strzemiński Academy of Art in Lodz
- University of Information Technology and Management in Rzeszow
- Akademia Humanistyczno-Ekonomiczna w Łodzi
- University of Opole
- Tishcher European University
- Kielce University of Technology
- University of Silesia
- University of Silesia: Game Lab
- Jagiellonian University in Krakow
- ASP Katowice
- Akademia Sztuki W Szczecinie
- Kazimierz Wielki University
- Lodz University of Technology
- Academy of Arts and Design Wrocław
- Collegium Da Vinci
- Warsaw Film School
- Polish-Japanese Academy of Information Technology

Key game industry-focused support instruments

- Development grants of creative industries
- Digital Innovations (B+R)
- Smart innovations (B+R)
- Brand promotion (exports, events attendance)

Key private investors focused on game development

- ArtsAlliance
- BnP Investment Fund
- FFVC Tech and Gaming
- Leonardo Fund
- Unfold VC
- SMOK VC
- Tarheel Capital
- Innovo
- PlayWay Group
- Status Games
- QubicGames: Group
- Erebor Capital
- Akcelerator+
- Games Fund ASI
- JR Holding

Key sustainability actions

- None

Key Challenges:

- Lack of support for game industry cluster organisations
- Lack of national strategy of building up key international events
- Limited talent pool with big experience
- Limited funding, too complicated funding
- Bureaucracy, too complicated laws, too many new legislations

Key contacts for further information

- [Game Industry of Poland 2023](#)
- [Indie Game Poland Foundation](#)
- ✉ Indie Game Poland Foundation: [Jakub Marszałkowski](#)

GERMANY

Key facts (2021)

- 717 studios
- 10 906 employees
- EUR 3 740M combined turnover

Major game industry hubs

- **Berlin:** 250 studios, over 2500 employees
- **Hamburg:** 117 studios, over 1500 employees
- **Dusseldorf/Cologne/Bonn/Eszen:** 89 studios, over 1000 employees
- **Munich:** 79 studios, about 1000 employees
- **Frankfurt:** 22 studios, over 100 employees
- **Nuremberg/Wurzburg/Regenzburg/Baureuth:** 39 studios, over 100 employees
- **Haidelberg/Karlsruhe:** 39 studios, over 100 employees
- **Hanover:** 20 studios, over 100 employees

Key professional game education institutions

- All in all 54 formal and 53 non-formal game education institutions
- [BIB International College](#)
- [Design Akademie Rostock](#)
- [Film Akademie Baden-Wurttemberg](#)
- [Games Academy](#)
- [HAW Hamburg](#)
- [Hochschule Augsburg](#)
- [Hochschule Darmstadt](#)
- [Hochschule der Medien](#)
- [Harz University of Applied Sciences](#)
- [Mittweida University of Applied Sciences](#)
- [Neu-Ulm University of Applied Sciences](#)

- [International Hochschule](#)
- [School4Games](#)
- [Creative Media Institute](#)
- [Furtwangen University](#)
- [Hochschule Heidelberg: Game Design](#)
- [Hochschule Heidelberg: Game Art](#)
- [Technische Universität Darmstadt](#)
- [University of Europe](#)
- [University of Cologne](#)
- [Diploma University of Applied Sciences](#)
- [Macromedia University of Applied Sciences: Games & Coding](#)
- [Macromedia University of Applied Sciences: Game Design & Development](#)
- [Ostfalia](#)
- [Paderborn University](#)
- [HTW](#)
- [Fresenius](#)
- [MDH](#)
- [School of games](#)

Key game industry focused support instruments

- [German Federal Games Funding](#)
- [There are number of regional funding instruments targeted for games industry](#)

Key private investors focused on game development

- [IBB ventures \(A subsidiary of Investment Bank Berlin\)](#)
- [BLN capital](#)
- [Gameseer](#)
- [WeplayVentures](#)
- [Heartcore](#)

Key sustainability actions

- [German Game Environmental Guide](#)
- [Game Forest Club](#)

Key challenges

- Lack of investment in game education
- lack of highly specialised, experienced professionals
- Lack of investment in high-quality digital infrastructure
- Lack of investment in support for start-ups and infrastructure for game development
- More information

Key contacts for further information

- [Annual Report of the German Games Industry 2022](#)
- [GAME](#)
- ✉ [GAME: Ina Göring](#)

SELECTED OTHER COUNTRIES

ROMANIA

Key facts (2021)

- 228 studios
- 6 700 employees
- EUR 293M turnover

Major game industry hubs

- Bucharest: 106 studios, over 5000 employees
- Cluj-Napoca: 38 studios, over 100 employees
- Craiova: 1 studio, over 100 employees

Key professional game education institutions

- All in all, 6 formal and 3 non-formal game education institutions.
- Ion Mincu University of Architecture and Urban Planning

Key game industry-focused support instruments

- None

Key private investors focused on game development

- None

Key sustainability actions

- None

Key challenges

- Lack of investment in game education
- Lack of investment in game industry support instruments

Key contacts for further information

- Romanian Video Game Industry Report 2023
- RGDA

✉ RGDA: Andreea Medvedovici-Per

Key game industry-focused support instruments

- Loans and equity: AWS
- Launching a company & Product development: Vienna Creative industry Project

Key private investors focused on game development

- None

Key sustainability actions

- None

Key Challenges

- Lack of incubators supporting SME game developers to grow
- Lack of private investors interested in the field
- lack of visibility in politics and public perception

Key contact and recent studies for further information

- Game Development Studie (2019)
- ÖVUS Studie (2023)
- PGDA

✉ PGDA: Dietmar Hauser

CZECHIA

Key facts (2021)

- 134 studios
- 2 329 employees
- EUR 290M combined turnover
- Major game industry hubs:
- Prague: 70 studios, over 1000 employees
- Brno: 30 studios, over 100 employees

Key professional game education institutions

- All in all, 10 formal and 2 non-formal game education institutions.
- Czech Technical University in Prague
- Brno University of Technology, Faculty of Information Technology

Key game industry-focused support instruments

- None

Key private investors focused on game development

- None

Key sustainability actions

- None

Key challenges

- Lack of incubators supporting SME game developers to grow

Key contacts for further information

- Czech Video Game Industry (2020)
- GDACz

✉ GDACz: Pavel Barak

AUSTRIA

Key facts (2023)

- 100 studios
- 600 employees
- EUR 30M combined turnover

Major game industry hubs (2019)

- Vienna: 60 studios, over 100 employees
- Graz, 15 studios, over 100 employees
- Salzburg, 12 studios, less than 100 employees

Key professional game education institutions

- All in all, 13 formal game education institutions
- BFI Wien
- TU Wien
- TU Graz
- FH Salzburg
- FH Hagenberg

SERBIA

Key facts (2021)

- 130 studios
- 2 200 employees
- EUR 125M turnover

Major game industry hubs (2022)

- **Beograd:** 82 studios, over 1800 employees
- **Novi sad:** 27 studios, over 500 employees
- **Nis:** over 10 studios, over 100 employees

Key professional game education institutions

○ All in all, 13 formal and 2 non-formal game education institutions

- [DSI](#)
- [FCA](#)
- [FDU](#)
- [FTN](#)
- [Univerzitet Metropolitan](#)
- [FMK](#)
- [University of Arts in Belgrade](#)
- [Novi Sad Academy of Arts](#)
- [Crater Training Center](#)
- [SAE Institute Belgrade](#)
- [Epic Games Community Lab](#)
- [Art Bully Training Center](#)
- [Onyx Studio Training Center](#)
- [More information](#)

Key game industry-focused support instruments

- None

Key private investors focused on game development

- None

Key sustainability actions

- None

Key challenges

- Non-existence of funding and financing schemes tailored to the specific industry (while there are valuable state and other start-up support mechanisms at large)
- No formal “360” acceleration program for game development start-ups
- Lack of (local) senior talent and closer, more structured ties between the industry and academia
- Lack of business development skills among the indie game developers

Key contacts for further information

- [Serbian Games Industry Annual Report \(2022\)](#)
- [SGA](#)

✉ SGA: [Relja Bobić](#)

BELGIUM

Key facts (2021)

- 85 studios
- 805 employees
- EUR 83M combined turnover

Major game industry hubs (2022)

- **East-Flanders** (including Ghent): 24 companies, over 100 employees
- **Antwerp** (including the city of Antwerp itself): 17 studios, less than 100 employees
- **Brussels:** 13 studios, less than 100 employees
- **Flemish-Brabant** (including Leuven) and **Limburg** (including Hasselt): 8 studios, less than 100 employees
- **Hainaut** (including Charleroi): 10 studios, more than 100 employees

Key professional game education institutions

- All in all, 5 formal game education institutions
- [Haute Ecole Albert Jacquard](#)
- [HOWEST Digital Arts and Entertainment](#)
- [LUCA School of Arts](#)

Key game industry-focused support instruments

- [Loans and Equity: Flanders Media Invest](#)
- [Production and promotional support: VAF](#)
- [Tax Shelter for Video Games](#)
- [Flanders Investment and Trade \(FIT\) and its Walloon counterpart AWEX](#)

Key private investors focused on game development

- [ForsVC \(Kortijk\)](#)

Key sustainability actions

- None

Key challenges

- Create junior job positions to mitigate our brain drain
- Find senior talent (contrary to the lack of jobs for juniors, we also face a war for senior and experienced talent)
- Increase private and public funding
- Coach game developer studios to grow from starter/start-up to scale-up

Key contact and recent studies for further information

- [Belgian Games Industry](#)
- [Flega](#)
- ✉ Flega: [David Verbruggen](#)

ANNEX 2: SUSTAINABILITY ACTIONS

The game industry is increasingly aware of the need to participate in the fight against climate change. Multiple companies have their own actions, and there are different joint initiatives on stopping climate change and saving the environment. Playing for the Planet Alliance is a global initiative to bring together game companies and trade associations to impact climate topics and other environmental topics linked to the game industry. Finnish game developers have their own initiative to support biodiversity with the Pelimetsä initiative. French industry united around the Jyros project to build their own CO2 calculator.

Many game developer studios are working to cut their carbon emissions. Many game companies plan to achieve net-zero carbon emissions or carbon neutrality within the next couple of decades. On top of that, some companies have started to calculate their carbon emissions to figure out where they stand and find potential places to cut those emissions.

Game companies are also known to offset their emissions. Offsetting is an essential tool for game studios as the emissions from players' devices are an important source of game industry emissions. Unfortunately, it is hard for game developers to affect how the energy used to power the game devices is produced.

Some game companies are also trying to find a way to activate players on climate topics. For example, Playing for the Planet Alliance organises a Green Game Jam yearly to engage the players in environmental issues. In 2023, the theme for the jam was Gaming for Wildlife. Protecting wildlife and vulnerable ecosystems supports the planet's ecological balance and is part of the fight against climate change.

LIST OF LEADING GAME INDUSTRY SUSTAINABILITY ACTIONS

- Finnish game industry CO2 calculator: <https://neogames.fi/a-finnish-game-industry-model-for-calculating-your-game-developer-studios-co2-emissions/>
- Pelimetsä initiative: <https://pelimetsa.fi/en/>
- French game industry CO2 calculator: <https://jyros-jeuvideo.com>
- German Game Environmental Guide: <https://www.game.de/en/guides/game-environmental-guide/>
- Game Forest Club: <https://gamesforest.club>
- Nordic PlayCreateGreen initiative: <https://playcreategreen.org>
- Playing for the Planet Alliance: <https://www.playing4theplanet.org/resources>
- UK Green Games Guide: <https://ukie.org.uk/sustainability>



ANNEX 3: USE OF AI IN THE GAMES INDUSTRY PROFESSIONS

AI can give significant support and enhance efficiency. Based on Bain and Company's recent study¹, AI's most important effect in the future will be in production. In five to ten years, content developed by generative AI is estimated to grow from less than 5 per cent to 50 per cent. Even though AI seems to be enhancing the efficiency of development rather than replacing humans, training the data for AI also demands a consequential number of resources. The future might seem murkier for music and sound artists, but there is already evidence that AI has almost entirely replaced these professions. But even though AI can give a lot of support and extra hands (and brains) in many occupations, it still needs humans to ensure results and screen the processes.

PROFESSION AND SKILLS	IMPACT OF AI
General skills	
Leadership skills	AI can assist and support laborious tasks and create templates and suggestions
Interaction and communication skills	AI can be used for better chatbots and fine-tuning emails
Continuous learning skills	AI can explain concepts and help solve problems
Self-determination skills	AI can organise tasks and give advice
Teamwork skills	AI can provide neutral advice to the team
Producer	
Partnership management skills	AI can assist with several tasks, including project management
Team coaching skills	AI assistant/coach
Change management skills	AI can assist in creating and implementing strategic changes to different levels of the company and/or development
Strategic planning and goal-setting skills	Assisting in setting goals, creating strategic plans and helping to solve problems
Project budgeting skills	AI can create budget templates
Legal rights and responsibilities skills	AI can pre-screen contracts and create templates
Risk management skills	AI can recognize potential risks and help solve problems
PROFESSION AND SKILLS	IMPACT OF AI
Quality management skills	AI can give proposals of details of quality framework
Project management skills	AI can assist project management or even take more considerable responsibility for that. Setting milestones, monitoring processes and proceeding, keeping up schedules
Resource management skills	AI can share tasks for the team monitoring proceeding
Game development process and workflow management skills	AI can assist in every level of game development processes by giving a few extra hands. AI can support keeping up with schedules.

1) Bain & Company: How Will Generative AI Change the Video Game Industry? Available in: <https://www.bain.com/insights/how-will-generative-ai-change-the-video-game-industry/>

Scope management skills	AI can be used to keep up with schedules.
Live ops expertise	AI can support the fine-tuning and timing of live ops actions. Pointing and fixing bugs, generating or varying new content, balancing the game, supporting interaction with the player community, assisting with player support
Games as a service expertise	AI can be used to balance games and recognise player preferences, dislikes, or problems. AI can suggest new phases of production based on analysing players and their behaviour.
Community manager, digital marketing and brand communication	
Special communication skills	AI can create suggestions/templates, finetuning communication
Social media analytics skills	AI can give support and give tentative analyses of social media analytics and make forecasts based on that
Appstore optimization skills	AI can recognize and define optimal features for app stores; however, the impact will decline when this becomes a common practice for many
Moderation skills	AI bots can perform moderation and recognize unwanted behaviour
User acquisition skills	AI can recognize potential customers inside the game, for example, for the developer's other games. Privacy regulation limits performance marketing outside the game
Social media platform expertise	AI can help with timing and content creation in social media
Digital trends expertise	AI can explain current trends and help developers take over those
Quality assurance	
Game testing skills	AI can replace technical testing and difficulty balancing at a certain level.
Player experience testing skills	AI can not simulate human feelings and gameplay experience.
Performance testing skills	AI can analyse performance
Analytics testing skills	At a certain level, AI can support analytics testing
Functional testing skills	AI can cover the majority of functional testing
Tool testing skills	AI can cover the majority of tool testing
Automation testing skills	AI can cover the majority of automation
QA process skills	AI can cover the majority of QA
PROFESSION AND SKILLS	IMPACT OF AI
Audio & music	
Audio artist	AI can be used to compose and generate new music. It can give support or take over music production and editing
Dynamic game music skills	AI can assist artist to create and variate their own content
Music implementation skills	AI can play instruments
Sound design skills	AI can give support on sound design and variate results

Recording skills	AI can support or take over editing, mixing, mastering and improving sound.
Audio implementation skills	AI can create sounds and audio content for games
Game Programmer	
Programming skills	AI can assist programmers in coding.
Artist	
Visual and concept design skills	AI can give ideas for concept design. AI can be trained for a particular style of artist, and it can generate, and fine-tune content based on that. However, it is notable that creating content with specific needs is still quite challenging, and the results of AI are often entirely arbitrary and, at the same time, general, but not exactly what the artist wanted, and it is also difficult to modify the end results along the artist's specific plan or design
Co-creation skills	AI can facilitate teamwork.
Content creation skills	Artist can educate AI to create art based on their own content. AI can generate variations of their own content that has been created and give ideas based on that.



THE STATE OF THE EUROPEAN GAME INDUSTRY

and how to unleash
its full potential

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