THE ROLE OF MOBILE APPS IN THE VIDEO GAME INDUSTRY

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Table of Contents

1. Introduction: scope of the guide

According to the latest available figures, the video game industry is booming. Not only does it have substantial global revenues but also creates significant employment in the entertainment sector, both directly and indirectly. Further, it is a driving force in the digital sector. Unsurprisingly, the video game market already enjoys a certain level of maturity, given it emerged in the 1980s. In Europe, the value is estimated in 2021 at 23.3 billion euros,[1] while in the United States of America, this figure rises to 97.67 US billion dollars (89.30 billion euros).[2] Although global figures indicate a gradual reduction in spending per user, they also point to a steady rise in the number of downloads.[3]

These numbers show that the gaming app sector is extremely active and accessible, even to individual entrepreneurs and small and medium-sized businesses, because of the low barriers to entry to the market. While developing video games for consoles generally requires significant infrastructure, financial support and a publisher to back the product, the digital distribution of games via app stores such as Google Play or Apple's App Store is more accessible to developers of any kind. They can reach a global audience from anywhere in the world, without physical inventory, and with the endless capabilities that modern cloud computing infrastructure provides to authors and creative industries.

The emergence of smartphones in the 2000s changed the way we communicate, and also marked a major stage in the evolution of the video game sector. The revolution in video games themselves, their relationship with the software and app industries, which goes far beyond game consoles and computers, as well as the progressive gamification of entertainment and other aspects of life, explain the growing importance of apps and gaming experiences. It is easy to identify how video games, combined with apps, offer a multitude of possibilities beyond entertainment, in the areas of education, fitness and health, to name but three. According to the mobile data and analytics platform, data.ai, there are no fewer than 20 types of apps (health, culture, business and retail, among others), and more than 15 types of video games,[4] meaning the combination of both offers almost infinite possibilities in the practical uses of apps.

The purpose of this guide is to analyze and offer a practical approach to the study of apps in the video game sector, from commercial and legal points of view, in view of the depth and complexity of the industry.

The guide covers the different types of video games and the new ways they can be monetized, such as through e-sports and streaming, as well as their relationship with social networks and gambling.

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[1] European Parliament. "Developing the video games and e-sports sector in the EU." *europarl.europa.eu*. 2021 figures, June 2023.

[2] In general terms, the app market, all categories, is also a growing market. In Europe, it was estimated to be worth 56.24 billion US dollars in 2022, 156.2 billion US dollars in the United States and 236.60 billion US dollars in Asia. More information is available on the Statista website, https://www.statista.com/outlook/dmo/app/europe; https://www.statista.com/outlook/dmo/app/united-states; https://www.statista.com/outlook/dmo/app/asia.

[3] Data.ai. "State of Mobile Gaming 2023." *data.ai*. 2023. <https://www.data.ai/en/go/state-of-mobile-gaming-2023?utm_source=google&utm_medium=cpc&utm_campaign=emea-sem-202304-state-of-mobile&utm_content=advert-&sfdcid=7016F000002Y563&metadata_cid=1220059&utm_source=&utm_campaign=&utm_medium=&utm_content=&utm_term=mobile%20gaming%20data&gad=1&gclid=EAIaIQobChMIkLusgL2wggMV7DkGAB0OdQeIEAAYASAAEgK1svD_BwET>.

[4] *Ibid.*

Further, it also addresses the main legal and technological challenges that have emerged due to the arrival of disruptive technologies such as artificial intelligence (AI) and large-scale projects such as the metaverse, in which both video games and apps are set to play a leading role.

This is an executive guide. As such, it will first describe and analyze apps for the video game sector, the different types that currently exist, their relationship with platforms, and how they have transformed our understanding of the digital ecosystem.

Second, it will look at how intellectual property (IP) laws protect apps. In this context, it will differentiate between the protectable parts, such as graphic content (mainly interfaces), source code and literary works. It will also distinguish between the way preexisting or third-party content is protected versus other elements created by the app developer.

Third, it will study the influence of apps on the development of video game-adjacent industries. Among these are the streaming and broadcasting sectors through which platforms such as Twitch and YouTube offer specific functionalities, and in which true celebrities have emerged, thanks to the streaming of gameplay. Also, e-sports and social networks have played, and continue to play, extremely important roles for video game developers, publishers and gamers in expanding their audiences. The legal and commercial implications of video games with social functionalities will be covered, including games, such as Fortnite, which can be considered social networks themselves, as they were conceived to create a community in contrast to games solely for individuals.

As mentioned, the functionalities of video games can go beyond entertainment, and the legal and commercial aspects of other types of categories, such as serious games, fitness games and health games, among others, will also be covered.

Finally, the guide will look at the arrival of disruptive technologies in the video game sector, analyzing when new technology or a device represents a genuine breakthrough, and how current developments such as the metaverse or AI will affect the gaming industry. It will provide insight into how these technologies will be affected by the international legal framework, their risks, the business opportunities opening for developers, and how developers can monetize their work through IP rights.

We aim to provide a complete overview of the video game sector and its relationship with apps, a flourishing industry in which developers from any country can reach global audiences, with a major impact on their local communities.

2. What is an app? Types of apps and platforms

👍 **"An app can be defined as a complex multimedia process consisting of a combination of different elements of software code, text, images and sounds" (Moerland and Shemtov).**
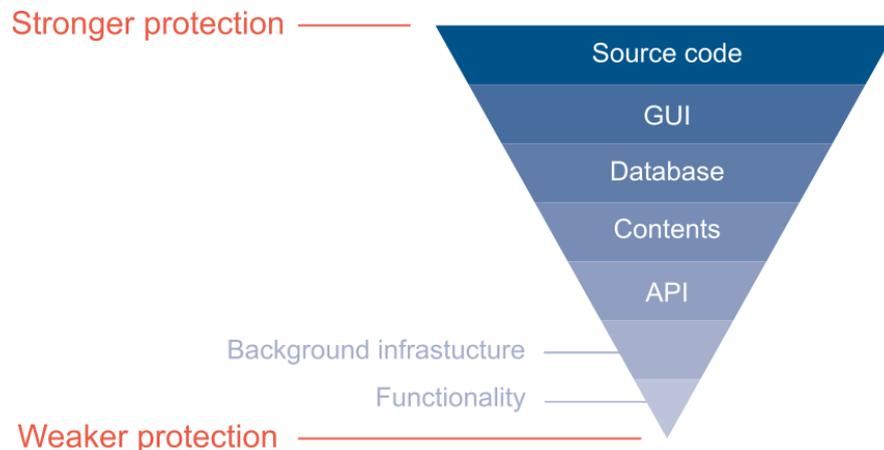
Stronger protection

Source code
GUI
Database
Contents
API
Background infrastucture
Functionality

Weaker protection

Figure 1 **App components** | Source: Authors.

Among the industries related to the arts and culture, the entertainment software sector has been one of the last to emerge, for obvious technological reasons, but has rapidly surpassed other products in terms of gross revenue.

The first electronic games emerged in universities in the United States of America in the 1950s, in the form of virtual versions of classic games such as tic-tac-toe, where the user played against the machine, a breakthrough at the time.[5] However, due to technological limitations, these games lacked motion graphics animation, a feature that arrived some years later, along with the first console, Magnavox Odyssey, in 1966.

During its first three decades, the video game industry developed and marketed its products to a limited number of platforms, either consoles (Nintendo Entertainment System, or NES, Sega Genesis and Nintendo Gameboy, among others) or personal computers (primarily Microsoft Windows). At this time, the retail market for video games was highly fragmented, and portable games were reserved for dedicated handheld devices, until the popularization in the 1990s of the first mobile phones and personal digital assistants (PDAs). In 1997, Nokia introduced the popular game Snake for its Nokia 6110.[6] This was the dawn of a new era for both mobile phones and the mobile gaming industry. In those early years, video games were preinstalled on mobile phones, and it was not possible to add new games to the devices, mainly due to infrastructure and connectivity limitations. Subsequently, because of technological developments, in particular, storage capacity, network bandwidth and content availability, users could install new games on their devices. This was the inception of the app industry that we know today.

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[5] History Computer staff. "OXO Game Guide: History, Origin, and More." *history-computer.com*. July 31, 2023. <https://history-computer.com/oxo-game-guide/>.
[6] Angelos, Ayla. "The history of Snake: How the Nokia game defined a new era for the mobile industry." *it'snicethat*. It's Nice That. Feb. 23, 2021. <https://www.itsnicethat.com/features/taneli-armanto-the-history-of-snake-design-legacies-230221>.

This new mobile games industry, which distributes exclusively via digital means, originally started using the term app to describe software that could be installed on a mobile phone.

App is the abbreviation of software application, a program designed to be executed on a computer to carry out one or more tasks and operated by end users (either individuals or professionals).

From a legal standpoint, software for a desktop computer is no different from a mobile app, but when using this abbreviation, the industry frequently refers to self-contained software packages that permit users to perform tasks on mobile devices, mainly phones. For the purpose of this guide, when using the term app, we refer to computer software specifically designed for mobile devices.

Moerland and Shemtov define an app as "a complex multimedia process consisting of a combination of different elements of software code, text, images, and sounds. These different elements that make up the app can be protected individually under IP laws".[7] Consequently, when such a multimedia process includes certain game mechanics, we are dealing with a gaming app.

Understanding the different components of an app is also essential if one is considering entering the video game sector, given it is a creative industry heavily reliant on generating and using IP rights. Additionally, each of the elements of an app may have a different system of protection; therefore, video game developers must understand such technical architecture and its legal implications to achieve an adequate level of protection, while avoiding infringing third-party rights. Video game apps typically have the following components:

1. **Source code**: the most fundamental part of an app, made up of sequences of words with functions, descriptions, calls, definitions, methods and other operational semantics, in a human-readable form, that, once compiled into object code, can be executed on a computer. In the video game industry, the source code of a given title is not developed from scratch for each game. Instead, providers of middleware solutions (such as Unity, which owns a video game development solution with the same name, or Epic, developer of Unreal Engine), the most popular game engines, license development tools (also in the form of software) that enable programmers and artists to create video games that are subsequently run on mobile phones, also using such game engines.[8]

2. **Graphical user interface (GUI)**: a digital interface, with graphics, icons, buttons and menus, through which users interact with the app, ordering actions predetermined by the developer and executed by the computer program. In a video game, the GUI is usually the most important component of the game, since this is what the player interacts with.

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[7] Moerland, Anke, and Noam Shemtov. "Intellectual Property Toolbox for Mobile Applications Developers." *wipo.int.* World Intellectual Property Organization, 2021. <https://www.wipo.int/export/sites/www/ip-development/en/agenda/docs/wipo_ip_toolbox_mobile_apps.pdf>.
[8] Ramos, Andy, *et al.* "The Legal Status of Video Games." *wipo.int.* World Intellectual Property Organization, 2013. <http://www.wipo.int/export/sites/www/copyright/en/creative_industries/pdf/video_games.pdf>.

3. **Database**: a structured set of data of any kind held in an information system. In the video game sector, databases may contain the game's assets (such as textures, sounds, models and levels) or information on players involved in online gaming.

4. **Contents**: the artistic elements of the app, which may include graphics, animation, text, musical compositions, sound recordings and photographs, whether protected by copyright or not. Copyright laws grant exclusive rights to the creators of original works to control the exploitation of their works. Given the specific nature of video game content, copyright is an essential tool for authors and producers when seeking to protect their creative works.

5. **Functionality**: refers to what the app can do and how it operates to fulfill its purpose and serve gamers. It encompasses all the features, capabilities and interactions that the app offers to its users, which, in the realm of video games, are generally called game mechanics. Thus, the functionalities of a gaming app include specific rules, systems and interactions that define how the game operates and how players can interact with it (achieving objectives, progressing in the game and receiving challenges and rewards). Game mechanics are the building blocks that shape the overall gaming experience. It is important to note that legal protection of functionalities or game mechanics is complex, as copyright does not protect ideas, concepts, facts or the utilitarian aspects of a game, only the specific expression of an idea or creative work.

6. **API (application programming interface)**: set of rules and protocols that allows different software applications to communicate and interact with each other. For example, in the gaming industry, some developers need services from third-party providers (such as Google Maps). Conversely, some publishers may make APIs of their popular games (including League of Legends and Dota 2) available to third parties to get data about the players, items, tournaments, teams, matches and leagues, and to analyze such data (for example, for amateur e-sports experiences). Therefore, APIs define the methods and data formats that apps can use to request items and exchange information, services or functionalities with each other. APIs enable developers to access specific features or data from an application or service without having to understand the underlying code or internal workings of that application.

7. **Background infrastructure**: the underlying technological components and services that operate behind the scenes to support an app's functionality. Traditionally, apps operated on a stand-alone basis on mobile phones, but thanks to the technological development of networks and wireless connectivity, many modern apps use cloud computing infrastructure to enable online gaming or games that require special computing capabilities. This infrastructure is comprised of servers, both wired and wireless telecommunications networks, and ancillary services (such as security and notifications), which are not directly visible to users but are essential for the app to function properly and efficiently.

Nowadays, apps in the gaming industry are as complex as the developers want them to be. Some simple games take up only a few kilobytes and can be executed autonomously by almost any mobile phone, while others require high-end devices, with special CPUs (central processing units) and GPUs (graphics processing units), storage capacity and best-in-class network connectivity. Also, video game developers must consider the distinction between mobile phone games and portable electronic gaming devices. While handheld video games have a greater

link with major console manufacturers (such as Nintendo, Valve or, until recently, Sony), mobile games must consider the technical features of different smartphone operating systems (that is, Google Android and Apple iOS).

Regarding suitability for gameplay, handheld gaming devices are specifically designed to create an optimal gaming experience, while mobile games exist in a multipurpose ecosystem, where applications such as calls and text messages are the top priority for the technical design of the devices, at least for most mobile phones. These factors are essential when developing a video game because the developer must consider the platform for which the title will be available; the more platforms a developer wants a game to be compatible with, the more complex (and expensive) its development will be.

In the video game industry, various types of software cater to different aspects of gaming, game development and the overall game ecosystem. Some are suitable for desktop computers, others for mobile phones. They mainly differ based on their capabilities, functionalities and the purposes for which they are created, as they do not necessarily serve gamers just to satisfy their gaming appetite but to exploit ancillary aspects of games as well. Some of the following types of software are used in the gaming industry:

8. **Game development tools**: also known as middleware solutions, these are desktop software programs that development studios and programmers use to create and design video games.

9. **Gaming apps**: the industry usually employs the term app to refer to mobile games that are compatible with mobile phones, which operate on either Google Android or Apple iOS. A given title may be available for: (1) a portable console (like Nintendo Switch), either in physical format (stored on a cartridge or disc that must be inserted in the console) or in an online store (such as the Nintendo eShop), and (2) mobile phones, only in digital format. Even though, from a technical and legal standpoint, games for consoles and mobile phones are identical, the market tends to use apps only for software and games that are compatible with smartphones. In most cases, games for mobile phones are processed by the device itself, but modern consoles and apps such as the PlayStation 5 and the PS Remote Play allow gamers to play console titles on smartphones by streaming the game from the former to the latter.

10. **Game streaming apps**: platforms such as Twitch and YouTube Gaming allow gamers to stream their gameplay and watch live streams of other players. Surprisingly, the online streaming of gameplay, by professional players and home gamers, has become one of the most popular forms of content on video-sharing platforms and a successful marketing technique to engage young audiences.

11. **Companion apps**: video games (including World of Warcraft or EA Sports FC) can have apps that provide additional content, tools, or features related to the main game. These companion apps, which hold information that may also be accessed via the Internet, can include interactive maps, game guides, character inventories, trading objects, and more.

12. **E-sports apps**: video games are all about challenges and competition, against the computer, another player or oneself, and there are many apps related to electronic sports (e-sports), which are video game competitions. These apps allow users to compete

against each other, either professionally or as amateurs, or provide updates, schedules, live streaming and news about professional gaming tournaments and events.

13. **Gaming communities**: apps like Discord and Reddit, and gaming-specific social networks provide platforms for gamers to connect, communicate, share experiences and find like-minded players.

14. **Game-related news and media**: video game enthusiasts use apps from gaming websites, magazines and news outlets to receive the latest updates, reviews, walk-throughs, guides and articles about video games and the gaming industry, including tournaments and new launches.

Finally, in the video game sector, fans can also find apps that provide cheats, mods (short for modifications) and other content that is not sponsored by video game publishers, as well as apps (known as emulators) that allow users to play retro or classic video games on smartphones through emulation. These apps are controversial and sometimes infringe the IP rights of video game publishers because they circumvent technological protection measures, use third-party trademarks, reverse engineer the code of apps, use and exploit certain creative elements of video games, and breach the terms and conditions of games. Therefore, before launching an app that may contain such features, it is advisable to contact a local attorney and confirm that the app does not infringe third-party rights.

We have already mentioned that the video game industry has traditionally been fragmented, at least in places (physical and online) where gamers could purchase their favorite titles. In 2008, this changed radically with the launch of Apple's App Store, an online marketplace of apps compatible with Apple's iOS mobile operating system. This provided users with a safer and more secure environment because every app available at the App Store had to go through an internal validation process, which still exists today. This strategy proved very successful, and, as of July 2022, it had more than one million gaming apps, making gaming its most popular category, representing 13.66 per cent of the total number of apps.[9] As a result, over the past decade, starting from 2010, other online game stores have emerged, including Google Play, Steam, Epic Games Store, PlayStation Store, Xbox Store and Nintendo eShop, where gamers can purchase and download video games from a variety of publishers.

The video game industry has changed drastically due to the popularity of gaming apps and app stores for smartphones.

The industry's worldwide revenue is estimated to be almost 347 billion US dollars, most of which comes from the mobile gaming market (approximately 248 billion US dollars).[10] This trend does not seem to have reached its peak, with some analysts estimating the revenue of the global video game market may reach 533 billion US dollars by 2027. This is due, in particular, to the addition of new markets, demographics and immersive technologies, such as virtual reality (VR),

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[9] Statista. "Leading app categories worldwide in 2021, by downloads." *statista.com.* 2023. <https://www.statista.com/statistics/1189712/apps-downloaded-worldwide-category/>.
[10] Statista. "Video game industry: Statistics and facts." *statista.com.* Oct. 6, 2023. <https://www.statista.com/topics/868/video-games/#topicOverview>.

augmented reality (AR) and mixed reality (MR), which also require dedicated devices such as immersive glasses and headsets.

a. Video game app types: an overview for developers

Element	Please note:
Game development tools	Include all desktop software programs that development studios and programmers use to create and design video games.
Gaming apps	Some modern consoles and apps such as the PlayStation 5 and the PS Remote Play allow gamers to play console titles on smartphones by streaming the game from the former to the latter.
Game streaming apps	Streaming has become one of the most popular forms of content on video-sharing platforms and a successful marketing technique to engage young audiences.
Companion apps	Can include interactive maps, game guides, character inventories, trading objects, and more.
E-sports apps	Allow users to compete against each other, either professionally or as amateurs, or provide updates, schedules, live streaming and news about professional gaming tournaments and events.
Gaming communities	Provide platforms for gamers to connect, communicate, share experiences and find like-minded players.
Game-related news and media	Can be useful to receive the latest updates, reviews, walk-throughs, guides and articles about video games.

3. Legal protection of apps: intellectual property rights

👍 **There is no single and uniform legal protection for apps. The complexity of apps as digital products requires the application of different forms of protection. It is important to note that only the expression of an original idea can be protected.**

The gaming sector divides the components of apps, from a legal point of view, into three main categories (see fig. 2).

Code and archiquecture

Protected by copyright laws, trade secrets or non-disclosure agreements.

Graphical User Interface

Protected by copyright and related rights, trademarks and, eventually, industrial design protection.

Built-in functionalities

Not protected unless there is a tangible element that can be protected.

Figure 2 **Legal protection of app elements** | Source: Authors.

The legal framework covering an app usually involves the protection of the various elements that make up the app. As described, apps are composed of a variety of elements, owned by both the developer of the app and by third parties. There is no single and uniform legal protection for apps. On the contrary, the complexity of apps as digital products requires the application of different forms of protection, with different procedures and scopes.

Thus, the source code, which is critical to many applications, the architecture of the underlying information system, the GUI, the name of the application, and the text included in the software may have different forms of protection. The same is true for video games: they are complex works that combine a variety of different components, the protection of which is diverse. Moreover, the different business models in today's video game industry affect the IP rights that may be at stake in each case. With a myriad of consoles, personal computers, mobile phones and other handheld devices, all based on storage media and applications downloaded from the Internet, as well as newer businesses such as game-as-a-service business models, video game entrepreneurs must analyze how they want to monetize the video game to adequately protect it.

Generally, the gaming sector divides the components of apps into three main categories:[11] first, the code and architecture of the application; second, the GUI; and third, the built-in functionality of the application, which is usually more complex than the previous elements. From a legal point of view, the protection of each component of an app is different. The source code itself may be protected by copyright laws, although other forms of protection such as trade secrets or nondisclosure agreements may also be applicable. Each of the components of the GUI (graphics, characters, maps, objects, sounds, among other aspects) may be protected by copyright and related rights, trademarks or, in some regions, industrial design protection. And the protection of the integrated functionalities is always challenging since copyright does not protect ideas, but rather the original expression of ideas.

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[11] Shemtov, Noam. "Protecting your Mobile App: Intellectual Property Solutions." *wipo.int*. World Intellectual Property Organization, 2021.

a. Source code

From a technological standpoint, this is one of the most important parts of an app, as it provides the technical basis for the game. A few decades ago, when the video game industry emerged, game codes were created from scratch for each title, but to reduce development time and costs, and increase reliability, video game developers now use third-party tools, such as Unity or Frostbite, for this task. In addition, the back end of a gaming app usually consists of several components, including APIs, which play a crucial role in the interoperability of apps with other information systems to provide a better user experience. A good example of this is the Pokémon GO app, which revolutionized the video game sector in 2016 due to its augmented reality app, which was created by Niantic, Inc.

The source code and the object code are the engine of the app and are generally protected by copyright. For example, the Court of Justice of the European Union ruled in 2012 that "the source code and object code of a computer program are forms of expression of the program and therefore deserve copyright protection for computer programs under Article 1(2) of Directive 91/250".[12] The protection of source code is harmonized internationally, as a result of various international conventions, treaties and regional regulations, with the Berne Convention for the Protection of Literary and Artistic Works, adopted in 1886, the backbone of this system. Copyright laws give developers a flexible and durable framework, in contrast to the rigid tests such as the inventive step required by patents.[13] In Europe, this is embodied by the Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs, which is fully applicable to apps. In the United States, the Copyright Office has been accepting applications for software registration since April 1964,[14] an approach that has been maintained to this day.

Copyright protects literary and artistic works and, in the case of software, the actual lines of code, as long as they are the creative and original expression of an idea.

As noted above, ideas are not copyrightable, so the protectable element of computer code will not be its technical elements, functionalities or methods, but rather the literal code. Copyright protection is granted to original lines of code on creation and, except for formalities that may exist in certain countries (such as registration), authors do not in principle have to go through any kind of procedure to gain protection.

Copyright grants authors and creators of original works exclusive rights over their creations, giving them control over how their work is used and distributed. In the context of copyright, exclusive means that the rights granted to the author are restricted to them alone, and the author has the sole authority to exercise and control the specific rights over their original work. No one

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[12] European Union, Judgment of the Court (Grand Chamber). *SAS Institute Inc. v World Programming Ltd*, Case C-406/10, para. 38, May 2, 2012.

[13] European Commission, *Proposal for a Council Directive on the legal protection of computer programs*, COM (88) 816 final, chap. 3, sect. 3.6, Mar. 17, 1989, states: "It is further believed that within the framework of copyright, protection as a literary work is desirable. Copyright can provide the solution to ensuring adequate protection against misappropriation and, in particular, against unauthorized reproduction. Copyright has already in the past proved its capacity to adapt to new technologies, such as films and broadcasts. Copyright protection does not grant monopolies hindering independent development. Copyright protects only the expression but not the underlying idea of a work. It does not therefore block technical progress or deprive persons who independently developed a computer program from enjoying the benefits of their labor and investment."

[14] United States, U.S. Copyright Office. "U.S. Copyright Office and the copyright law: General background." *Compendium of U.S. Copyright Office Practices, Third Edition.* 2021, chap. 100.

else can use or exploit these rights without explicit permission or authorization from the copyright holder. The rights vary depending on the jurisdiction and the type of work but, in general, copyright provides the following moral and exclusive rights to authors:

(a) **Right of reproduction**: allows author to make copies of their work in any form, such as printing, recording or digitizing it.

(b) **Right of distribution**: author has the right to control the distribution of their work to the public in a physical medium, including selling, renting or lending it.

(c) **Right of public communication**: for certain types of works, such as music, plays, photographs, paintings or sculptures, authors have the right to control public performances or displays, including live performances, broadcasting or streaming.

(d) **Right of derivative works**: author has the exclusive right to create adaptations, translations or other works based on their original creation.

(e) **Moral rights**: apart from economic rights, some jurisdictions also recognize moral rights. These include the right to attribution (credit), the right to maintain the integrity of the work (prevent unauthorized changes), and the right to disassociate oneself from a work that has been altered in a way that could be prejudicial to the author's reputation.

These rights generally last for a specific and ample period, which varies depending on the jurisdiction and the type of work, but usually for at least 50 years after the author's death. After the copyright expires, the work typically enters the public domain, where it can be used freely by anyone. Further, the territorial protection of works is broad and covers all signatory countries of these international treaties, which are overseen by the World Intellectual Property Organization (WIPO).

Regarding the protection of a video game itself, as we have seen, its protection is as complex as the number of works of which it is comprised. It must be reiterated that only those elements that involve the expression of an original idea will be protectable, which is the standard in jurisdictions such as the European Union, as courts require that "the subject matter reflects the personality of its author, as an expression of his free and creative choices".[15] Similar approaches can be found in countries such as Kenya, the Philippines, Trinidad and Tobago, and the United States, where the ideas of a video game are not protectable but are the creative expression of such ideas when fixed in a tangible medium.[16]

The patent system can be useful for the protection of certain inventions of the video game sector, generally for hardware and to a lesser extent for software, depending on the jurisdiction.

Generally, patents are granted for inventions that are classified as processes, machines, articles of manufacture, compositions of matter or improvements thereof. Abstract ideas, laws of nature and natural phenomena are generally not considered patentable subject matter. In some

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[15] European Union, Judgment of the Court (Grand Chamber). *Cofemel - Sociedade de Vestuário SA v. G-Star Raw CV*, Case C-683/17. Sep. 12, 2019.
[16] Greenspan, David, and Gaetano Dimita. *Mastering the Game: Business and Legal Issues for Video Game Developers*. World Intellectual Property Organization. 2022, p. 62.

jurisdictions, patents can be granted to inventions that use a computer, computer network or programs to develop some of its functions.[17] If an invention meets the requirements of novelty, inventive step and industrial application, an app could be protected using a patent, although this is a more complicated option than copyright, particularly in the video game sector.

As an alternative measure, the code can be protected using trade secrets, provided that the code is not made public, and, of course, through confidentiality agreements with all the people involved in the creation of the source code. These forms of protection, especially trade secrets, tend to protect competitive advantages, so trade secrets can be defined as information that is secret in the sense that it is not generally known by or readily accessible to persons within the circles that normally deal with the kind of information in question, has commercial value and has been subject to actual protection by the person concerned.

In section 2, we explained that nowadays most of the source code of a video game, including mobile apps, is not created specifically for a game, but rather developers use commercial solutions during the creation process, which later form the basis of the app. This fact affects the rights that a developer may have to their game, because they may have exclusive rights to other elements of the application, but not to the source code, which is licensed by the middleware vendor. In some circumstances, a developer may have created small pieces of code or special subroutines for a particular title, for which they may indeed have exclusive rights. Developers must analyze all the components of a mobile application to determine which are licensed by the game engine right holder (to develop the game), and for which they can claim exclusive rights.

b. GUI protection

The GUI is the audiovisual part of the game, with which gamers interact, and which can embody multiple elements, such as literary works (scripts), characters, maps, objects and cinematics. In the pre-smartphone era, the cofounder of Apple, Steve Jobs, said "it's not just what it looks like and feels like. Design is how it works".[18] Video game GUIs follow the same logic. It is not just a matter of aesthetics. The visual elements are the bridge between the technical part of the app (source code and object code) and the gamer. GUIs are mainly protected by copyright and industrial design, and only under certain circumstances can some parts be protected by trademark and even patent law. Because GUIs are fully visible to users, other potential avenues of protection, such as trade secrets or the use of nondisclosure agreements, remain in the background.

In particular, and depending on the genre of the game and its complexity, GUIs may contain musical compositions, sound recordings, voices, sound effects, photographic images, digitally captured moving images, animation and text.

These elements can be protected by copyright and neighboring rights, depending on the object that requires protection. While author's rights primarily pertain to the creators or authors of original works, neighboring rights, also known as related rights, apply to individuals or entities involved in the performance and production of creative works, but who are not the original

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[17] European Patent Office. "Index for Computer Implemented Inventions." Guidelines for Examination. *epo.org*. 2023. <https://new.epo.org/en/legal/guidelines-epc/2023/j.html>.
[18] Walker, Rob. "The guts of a new machine." *The New York Times*. Nov. 30, 2023.

creators. Author's rights cover a wide range of literary, artistic and creative works, such as books, music, movies, paintings, software, photographs, and more; however, neighboring rights protect mainly performances (e.g., actors, musicians, dancers), phonograms (record labels), audiovisual recordings (producers) and broadcasting signals (TV and radio broadcasters).

The protection also differs in the duration of the exclusive rights, which usually spans several decades after the performance or recording. Neighboring rights provide performers with rights over the fixation and reproduction of their performances, phonogram producers over their recordings, and broadcasting organizations over their broadcasts. These rights enable them to control and license the use of their performances, recordings and broadcasts, ensuring fair compensation for their contributions.

In summary, author's rights (copyright) protect the interests of creators and authors by granting them exclusive rights to their original works, while neighboring rights protect the rights of performers, phonogram producers and broadcasting organizations in their roles of bringing creative works to the public. Both types of rights can be found in a gaming app if it contains, for example, drawings, icons, maps or characters (all of which are potentially protected by copyright), and sound effects, audiovisual recordings or musical performances (which may be protected by neighboring rights).

In the mobile game industry, it is difficult to establish hard and fast rules as to when an interface as a whole is protectable, given this depends on several factors, including the game's genre, jurisdiction and how it was developed.

An interface that simply arranges superfluous icons and images in a somewhat orderly fashion is unlikely to meet the threshold of originality. However, the more that the look and feel of the game is removed from mere functionality, the closer it becomes to being protectable by IP rights. A good example might be the GUIs of pinball games that replicate the physical arcade machines. No matter how much a designer may want to make an original interface, its design will largely be dictated by the old design and simplicity of the operation.

Depending on the country in question, design patents or industrial designs may be used to protect interfaces. For example, in the United States, a graphic interface may be protectable by a design patent, while in other jurisdictions such as Japan, the European Union and many European countries, an industrial design (or equivalent) may be considered. Industrial designs involve safeguarding the unique visual and aesthetic features of functional products, such as the shape, configuration, ornamentation or surface decoration of both physical and virtual objects, against unauthorized copying or imitation. In the European Union, protection is generally subject to registration, granted for five years from the date of the filing and renewed in blocks of five years up to a maximum of 25 years. The European Union Intellectual Property Office specifically states that "designs of screen displays and icons, graphic user interfaces and other kinds of visible elements of a computer program are eligible for registration".[19] This does not mean they are registrable in all circumstances, but it clearly opens the door to the protection of app interfaces as industrial designs, independent of and in addition to their possible copyright protection.

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[19] European Union Intellectual Property Office. "Design Guidelines." Guidelines for Examination. 2023 edition. *euipo.europa.eu*. <https://guidelines.euipo.europa.eu/2058424/1926295/designs-guidelines/4-1-3-icons--graphic-user-interfaces-and-the-like>.

In the case of GUIs, on the other hand, patents are not as relevant. GUIs are, by their very nature, closer to copyright protection than patents. However, if the interface (not the code) contains some functionality that is patentable, it could be asserted as such. There are examples of patents that are closely related to video game GUIs, generally of United States of America origin.[20] Trademark law should also be considered when developing the GUI, especially if the developer wants to include third-party brands in the game, which generally requires prior approval.

Nor should we forget that unfair competition can assist victims of GUI copying. Unfair competition refers to a business practice that is deceptive, dishonest or unethical and disadvantages other businesses or consumers in the marketplace. It involves acts that aim to gain an unfair advantage over competitors by engaging in practices that are harmful, fraudulent or misleading. Unfair competition is generally regulated and prohibited by laws and regulations in many countries, although the standards in each jurisdiction differ.

Now that video game studios are outsourcing development of app source codes to middleware vendors, the main IP rights they generate rest on the GUI. The legal protection of GUIs is highly complex, with copyrights and related rights serving as the pillars of the legal framework available to app developers, also taking into account trademarks, patents and unfair competition in certain circumstances.

c. Protection of functionalities: game mechanics

Functionalities allow users to perform all kinds of actions that, in the context of gaming apps, generally involves providing a better gaming experience and, therefore, more entertainment. In mobile gaming apps, these functionalities are usually embedded in the game mechanics, which can be defined as "proper tools for gameplay, atomic rule-based interactive subsystems capable of receiving an input and reacting by producing an output. Such output translates into a state change of the mechanics itself and/or into the triggering of new interactions with other game mechanics".[21]

The success of a gaming app depends largely on its playability, which is the ability of a video game to be enjoyable, thanks to its rules, objectives, features, methods and procedures. Examples include allowing community play, using technologies that provide some kind of added value such as augmented reality, accessing the mobile device's camera to generate content, or, in general, maximizing all the possibilities of the user's smartphone to apply them to the game.

The legal protection of functionalities and game mechanics is always a challenge because copyright does not protect ideas.

Game mechanics are generally these rules and procedures, and only when expressed in a creative manner, in the form of source code, GUI or any other object, and only in some jurisdictions, can they be protected by copyright law. Therefore, we are faced with the dilemma

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[20] For example, "Graphical Interface for Interactive Dialog", Patent WO2007133841A2, Nov. 27, 2007, which states: "A system and method for creating conversation in a computer program such as a videogame. A plurality of classes of dialog is provided and a conversation segment is assigned to each class. A graphical interface is displayed during operation of the program that provides a choice indicator, wherein the choice indicator has a plurality of selectable slots, each associated with a dialog class. The graphical interface is consistent as to the position of dialog classes throughout at least a segment of the program."

[21] *Ibid.*

of an idea and the expression of an idea. Only the latter is protectable, but as far as functionalities are concerned, it is difficult to see when the idea and its expression are separate.

In copyright law, this is important, because if the idea were protected, other developers would be prevented from putting it into practice, even if it were through other forms of expression. This is known as the merger doctrine, which holds that when there are expressions of ideas that merge with mere ideas, there can be no protection because it would create a monopoly. For example, in the case of an application that allows a video game to be played using the device's motion sensors, a legal monopoly could only be provided by copyright through the software elements that are susceptible to protection.

As described above, it may be possible to protect these functionalities by other means, such as patents. In this case, it is not the functionality itself as an idea that is protected but the underlying technology that makes such interactions possible. Patents protect inventions as long as they are novel (the result of inventive activity) and industrially applicable, which is a very high standard that only complex technologies can meet.
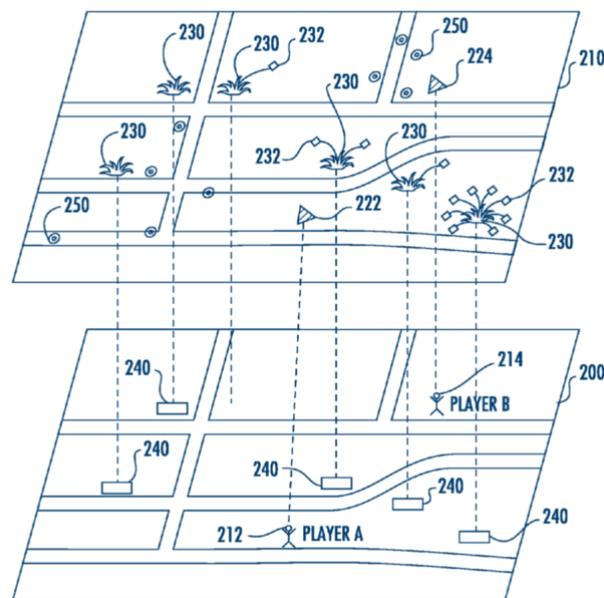

Figure 3 **US Patent 8968099, graphic showing operation of AR technology, as in Pokémon GO** | Source: Google Patents

This is the case with the popular app, Pokémon GO, developed by Niantic Labs, which obtained several patents for its augmented reality systems that served as the basis for the operation of the augmented reality functionality of the video game.[22] For example, its US Patent 8968099 (now owned by Google), filed in 2012,[23] described the following invention: "Systems and methods of transporting virtual objects through a virtual world associated with a parallel reality game are provided. The virtual world has a geography that parallels at least a portion of the geography of the real world. A method includes accessing at least one data source storing or providing data associated with the location of a real-world carrier. The method further includes

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[22] Brachmann, Steve. "Pokemon Go developer Niantic owns three patents on location-based gaming." *ipwatchdog.com*. IP Watchdog. Aug. 10, 2016. https://ipwatchdog.com/2016/08/10/pokemon-go-patents-location-based-gaming/id=71648/# >.
[23] Hanke, John V., *et al*. "System and method for transporting virtual objects in a parallel reality game." US8968099B1, US Patent and Trademark Office, Mar 3, 2012. *patents.google.com*. <https://patents.google.com/patent/US8968099B1/en>.

modifying game data associated with the parallel reality to transport at least one virtual object through the virtual world, such that the position of the virtual object in the virtual world is based, at least in part, on the data associated with the location of the real-world carrier." Therefore, it describes the technological application that is patentable as such, which overlaps with the functionality and game mechanics of the game itself.

Other avenues of legal protection can be explored, including trade secrets and unfair competition laws, although the outcome is uncertain.

Regarding trade secrets, the main requirement for asserting protection is that the information shall not be publicly available, which is extremely difficult to meet because functionalities and game mechanics are typically perceived by players as they interact with the app. Only if a studio can prevent disclosure of the elements of such game mechanics will it succeed in obtaining trade secret protection. Unfair competition, on the other hand, will be a valid remedy for game developers in only limited circumstances, such as when a competitor's behavior is deceptive or dishonest and creates a disadvantage for other businesses or consumers in the marketplace. This can happen when a competitor forcibly mimics or markets the functionality of a studio's game application, giving consumers the impression they are purchasing the original game. It is what unfair competition laws are designed to prevent.

Finally, as described in section 2, APIs also play an important role in mobile apps, as they permit different information systems to communicate. The regulation of IP rights is mainly regional, with a high degree of international harmonization due to various treaties and conventions, administered by WIPO. Additionally, this sector is highly standardized worldwide because of the international nature of marketplaces and app stores. Consequently, laws and rulings by major markets, such as the United States of America or the European Union, can affect other territories.

This is the case of the widely known General Data Protection Regulation (GDPR), which sets a standard for user privacy that has been adopted by many companies, and the United States Supreme Court[24] ruling of April 5, 2021, in *Google v. Oracle*, regarding the use of some 11,000 lines of an API source code. The court applied the fair use doctrine, finding that the copying was lawful because, among other reasons, the very purpose of the API is to enable other developers to use common methods to express ideas or, as in this case, functionalities in smartphones. This precedent is also valid for gaming apps.

In summary, the protection of functionalities is always challenging and restricted to those elements that, from a copyright point of view, represent the expression of concrete and original ideas. But the technology underlying a functionality may be eligible for patent protection, though for gaming apps this depends on the jurisdiction and on meeting the strict requirements for patentability.

d. Third-party rights

Gaming apps contain source code, game mechanics and a GUI, and may also include a myriad of other elements that can be protected under IP rights, such as images, sounds, audiovisual

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[24] United States, Supreme Court. *Google LLC v. Oracle America, Inc.*, 593 U.S. ___, 2021.

works and recordings, databases, plans and trademarks. Other intangible rights must also be considered, particularly publicity rights, which refer to a person's legal right to control and profit from the commercial use of their name, likeness, image, voice or other recognizable aspects of their identity. In most circumstances, these assets can be found in a mobile app, with the permission of the respective right holders.

To be able to use them, there must generally be a written contract between the right holders, which may be one or more natural or legal persons, and the video game developer. This contract is usually subject to remuneration and must be sufficiently broad to allow the exploitation of such third-party works without affecting the video game app. In this section, we have explained that copyright holders have exclusive rights to their works, which means that any reproduction, distribution, communication to the public or transformation must be authorized.

However, copyright laws provide some exceptions to this general rule, meaning that permission may not be required in certain circumstances. Using third-party materials based on one of these exceptions may reduce the cost of developing the video game but it increases the risks because the fine line is not always clear. The alternatives are:

1. **Works in the public domain**: The use of any type of work that is in the public domain due to the expiry of the legal period of copyright protection. This means it can be used by developers as long as the moral rights of the authors are respected (essentially, the integrity of the work and the attribution).

2. **Fair use**: The doctrine of fair use is typical of Anglo-Saxon copyright systems and allows the use of third-party works if four conditions are met. Although they leave room for interpretation depending on the specific use, these factors are: (1) purpose and nature of the use of the third-party work (for example, a video game app may be used for non-commercial purposes, such as education), (2) nature of the work in question (for example, with apps, the use of lines of third-party code, as described in the Oracle case, might be accepted), (3) quantity and nature of the part of the work used, and (4) the effect that such use may have on the market (where it is necessary to assess the extent to which the use may prejudice exploitation of the original work).

3. **System of limits to copyright**: This is typical in Europe and Latin America, and strikes a balance between protecting the interests of creators and promoting the broader public interest. Depending on the jurisdiction, this may include exceptions for quotations, parody, news reporting and works in public places.

4. **Use of third-party trademarks**: This is a much more limited exception. Third-party trademarks may be used without authorization only where their use is descriptive and is not intended as a trademark. This means that the use of trademarks may not distinguish products or services (the video game itself) in the market and is irrelevant in commercial terms.

As noted, studios must obtain prior permission before using third-party content in a gaming app. Only in limited circumstances is it permissible to use assets owned by others, based on fair use or limitations on exclusive rights, which can vary widely from country to country due to differences in copyright laws and international treaties. App studios must seek professional advice when making use of these exceptions to avoid future risks.

e. Summary of intellectual property rights that affect gaming apps

Element	What is protected	How is protected	Duration
Source code	The lines of code of the app (source code and object code).	Copyright law (right to reproduce, distribute, public communication and prepare derivative works, and moral rights).	Generally, at least 50 years after the author's death (depending on the jurisdiction).
Graphical user interface (GUI)	The audiovisual part of the game with which the user interacts. It can embody literary works (scripts), characters, maps, objects, cinematics, recordings and performances, among other elements.	Copyright law (including neighboring rights). Design patents and industrial designs.	Generally, at least 50 years after the author's death (depending on the jurisdiction). For performances and recordings, 50 years or more from the date of fixation or broadcast (depending on the jurisdiction). For industrial designs, five years from the date of the filing, renewed in blocks of five years up to a maximum of 25 years.
Functionalities/ game mechanics	Tools for an enhanced gaming experience.	Copyright law (only in a few cases). Patents. Trade secrets and nondisclosure agreements.	For patents, 20 years from filing. For trade secrets, an unlimited period, if the information is kept secret.
Third-party rights	All kinds of preexisting protected works, inventions, trademarks and designs.	Copyright law, patents, trademarks and design law. Exceptions include works in the public domain, fair use, a system of limits to copyright and non-trademark use.	For trademarks, 10 years from filing, with unlimited renewals.

4. Mobile apps and the distribution of video games: business models

👍 **Developers and platforms have a wide variety of business models to monetize video games. All these business models can be easily managed through an app.**
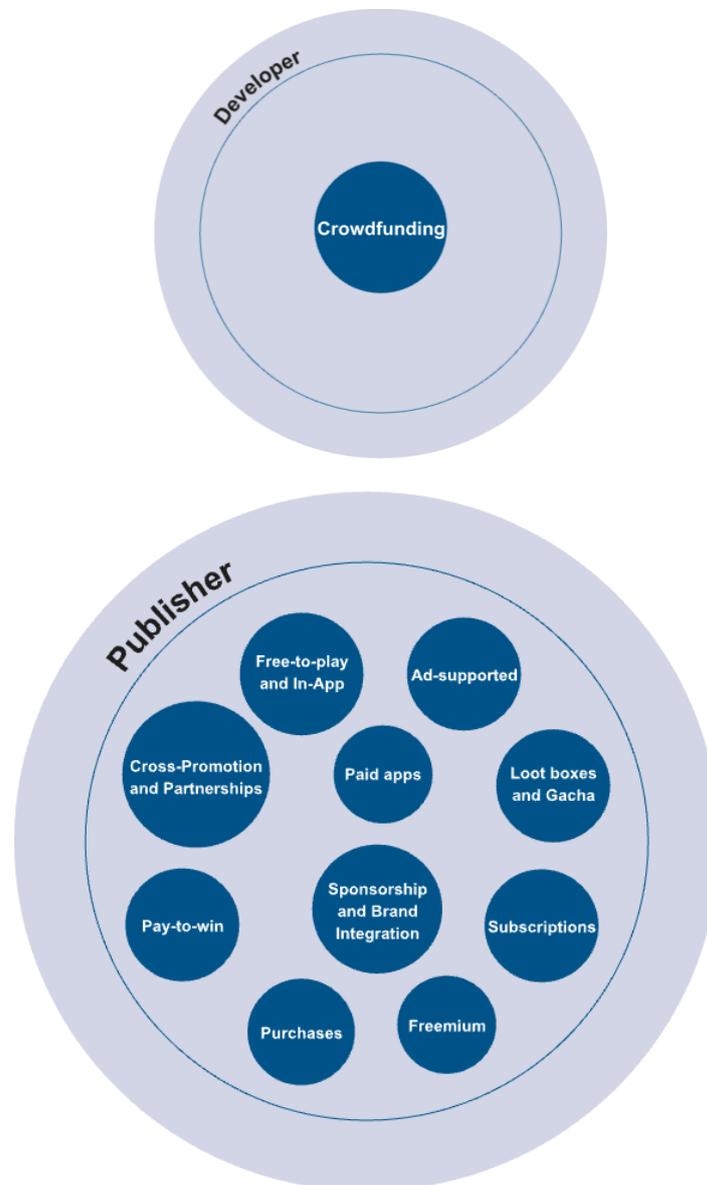

Figure 4 Developers and platforms have seen their market expand over past decades due to new business models | Source: Authors.

Mobile apps have radically changed the landscape of the video game industry in the past two decades, essentially because of the commercialization of smartphones. This has democratized the game development process mainly because of lower costs and emerging new business models, which allow gamers to enjoy certain titles for free or at a very low price. However, there

are downsides. Most of the revenues in this sector now go to a few large players who develop the most successful video games.[25]

Currently, the entire process of mobile app creation and commercialization is carried out digitally. As explained in section 1, this drastically reduces the barriers to entry to this market and permits new forms of distribution and monetization, especially when the gaming app is connected to the Internet, which is more frequent in smartphones than portable consoles. Traditionally, games were created by developers, either on their own initiative or commissioned by a publisher, and distributed by the latter, and this remains true for video games developed for consoles. Thus, publishers play an important role in the video game industry as, depending on the circumstances, they finance game production, market games and decide the territories where games will be commercialized and the launch date, including whether partial promotions or soft launches[26] may be suitable for a given title. They can also provide expertise on consumer consumption trends. In exchange, publishers usually demand a full and unconditional assignment of all the game's IP rights.

Even when it is advisable, as it is in most circumstances, to have the support of a publisher due to the complexity and maturity of this sector – a new app will be just one of millions of games available in an app store – the rise of mobile apps has permitted video game developers to self-publish, thus retaining all the IP rights. In this context, developers are responsible for all promotional efforts and the game's marketing strategy; in return, developers will retain all or most of the income from the app's exploitation, which they can allocate to the studio's next project.

Platforms like Google Play and Steam allow developers to upload or distribute their gaming apps quickly and easily, thus bypassing middlemen. Before publishing the game, these platforms usually require the studio or the individual developer to submit certain documentation, including the company's registration certificates and bank account statements, to confirm its good standing, mainly for compliance and anti-money laundering regulations. Also, developers must accept certain adhesion contracts set by the platform owner, including nondisclosure agreements (NDAs) and, more importantly, distribution agreements, which govern the relationship between the parties including, in terms of IP rights, marketing, support, revenue sharing, tax, data protection and warranties.

Although developers will be unable to negotiate individual sections of distribution agreements, it is crucial to read them, understand the legal implications and, if necessary, seek professional advice.

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[25] Greenspan and Dimita, *op. cit.*

[26] A soft launch, also a soft release or beta release, refers to the limited and controlled release of a video game/mobile app to a specific region or smaller audience before its full-scale launch, to gather feedback, test performance, identify and fix bugs and gauge player response. More information is available on the GamesIndustry.biz website, https://www.gamesindustry.biz/dont-do-that-what-to-avoid-when-soft-launching-a-game.

Most platforms follow a profit-sharing system in which a percentage (between 12 per cent and 30 per cent) of gross profits from the game sales is retained by the platform,[27] with the remainder distributed to the developer.[28] Further, if a developer chooses to enter an agreement with a publisher, the market-standard share for developers may range from 15 per cent to 80 per cent, depending on the project details. For example, if a studio develops a game and a publisher merely distributes it, then the developer is more likely to receive a bigger percentage; however, if the publisher is financing the game, totally or partially, then the developer's percentage will be lower, even with a complex formula of net revenues, so the publisher must ensure all advances and costs are recouped before sharing the profits with the developer. Once again, these deals usually have a certain degree of complexity, and seeking professional guidance is advisable to avoid future disagreement.

In terms of the business models that publishers and developers follow when distributing a game, there are multiple options. Publishers and developers may opt for one or another, or a combination of several, depending on different factors, including the development costs, intended audience and genre of the game. The common business models used by studios and publishers for gaming apps are as follows:

1. **Paid apps**: The classic distribution model, under which users pay a one-time fee to download and access the full game. Once purchased, the game is fully unlocked and there are no further in-app purchases or advertisements. This model is now common for premium or high-end games.

    Unlike the era of physical copies of games, in the mobile world users do not receive a medium where the game is stored. Instead, they receive a copy that is downloaded directly to their portable device. This digital copy is subject to acceptance of terms and conditions and application of consumer laws on digital content. These protective regulations, which apply in given territories, recognize some rights in favor of gamers, such as the right of withdrawal, under which consumers can withdraw from distance and off-premises contracts within 14 days, subject to certain exceptions, without explanation or cost.[29]

2. **Free-to-play (F2P) with in-app purchases (IAPs)**: Many mobile games use this model. It refers to games that are free to download and play (at least, for the most part), but which offer various in-game items, virtual currency, power-ups or cosmetic upgrades that can be purchased with real money. These microtransactions generate revenue for the game developer or publisher.

    When developing a video game, the studio must consider the different monetization options that will be included, such as the sale of in-game items or integrated

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[27] The amount of the percentage, and the means of collecting it, has been controversial. In August 2020, Epic sued Apple, challenging the restrictions on apps using alternative in-app purchase methods other than those provided by the App Store. Judge Yvonne Gonzalez Rogers of the United States District Court for the Northern District of California ruled for Apple on nine out of 10 counts. However, the ruling found that Apple's anti-steering policy violated California's Unfair Competition Law. As a result, Apple is prohibited from restricting developers from informing users of alternative payment systems within their apps. Epic appealed but the original ruling was upheld in April 2023. Both Apple and Epic appealed this decision to the Supreme Court in July 2023. More information is available on Wikipedia, https://en.wikipedia.org/wiki/Epic_Games_v._Apple
[28] Peters, Jay. "Epic will now let developers self-publish to the Epic Games Store." *The Verge*, Mar 9, 2023. https://www.theverge.com/2023/3/9/23630864/epic-games-store-self-publish-tools-ratings>.
[29] See the case of the European Union, with Directive 2011/83/EU of the European Parliament and of the Council, on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC, and repealing Council Directive 85/577/EEC and Directive 97/7/EC, Oct. 25, 2011.

advertisements. Thus, the game mechanics can be affected by the different revenue streams the developer includes in the game.

3. **Freemium model**: This combines elements of both paid apps and F2P with IAPs. The base game is free to download and play, but additional content or premium features can be unlocked through in-app purchases or by upgrading to a paid version.

   F2P and freemium models may raise legal implications in jurisdictions with developed consumer laws that seek to protect gamers. These regulations usually oblige video game developers and publishers to: (1) provide sufficient information about the costs associated with a game, in a clear, understandable and visible manner; (2) avoid misleading or aggressive advertisements; (3) avoid including direct appeals to children to make purchases or persuade others (such as their parents) to make such purchases for them; and (4) avoid including automatic payment systems to prevent unauthorized or unnoticed purchases.

4. **Subscriptions**: Some game platforms offer subscription-based access (Xbox Games Pass Ultimate, PlayStation Plus, Apple Arcade, among others), where users pay a recurring fee (monthly or annually) to access and play a catalogue of games offered by the platform. Subscriptions may provide exclusive content, bonuses, early access to new features or the possibility of playing classic games, including via streaming.

5. **Ad-supported**: Games that follow this model are free to play but display advertisements during gameplay or in between levels. The revenue is generated through ad impressions or clicks, usually managed by the platform owner (that is, Facebook or Google).

6. **Pay-to-win**: Players can spend real money to gain significant advantages in the game; for example, the ability to construct buildings or quickly train more troops. This model has been criticized[30] for potentially disrupting the balance and competitiveness of the game for non-paying players.

7. **Loot boxes and Gacha**: This model involves gamers purchasing random items or characters in the game. It can be a form of in-app purchase, and players have a chance to obtain rare or valuable items. This model has been criticised for resembling gambling but is regulated in very few territories.

8. **Sponsorship and brand integration**: Some games incorporate sponsored content or brands, where advertisers pay to have their products or logos featured, or the game itself may be fully backed by a brand. Frequently, independent studios provide apps, websites and/or game development services to brands as a way of obtaining funding to support their own project costs.

9. **Cross-promotion and partnerships**: Game developers may partner with other apps or brands to cross-promote their games and increase visibility.

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[30] Sajid, Hassan. "The battle for balance: Pay-to-win games and their impact on gaming culture." *xfire.com*. May 4, 2023. <https://www.xfire.com/the-battle-for-balance-pay-to-win-games-and-their-impact-on-gaming-culture/>.

10. **Crowdfunding**: Some indie games or projects rely on crowdfunding platforms to raise funds from backers before the game is developed. Crowdfunding is another phenomenon that has emerged from digital technology and involves a video game developer launching a campaign on a specific platform, providing the details of the gaming project, and committing to producing it if the campaign reaches the investment target as a result of funding from backers.

Crowdfunding campaigns have proved successful for indie developers. Kickstarter, the most well-known platform, has raised 1.4 billion US dollars for more than 65,000 gaming projects since 2009, with and some 40 per cent of the campaigns related to video games reaching their goals. Other popular crowdfunding platforms include Indiegogo, which, unlike Kickstarter, releases the funds obtained by studios even if they do not reach the investment goal, and Fig.co, where developers can offer some benefits to consumers and a share of future revenues to potential investors if they back the project.

Although it sounds ideal, the reality is that usually only projects backed by a celebrity, based on or inspired by classic games or genres, or with unique and innovative game mechanics, reach the target.[31] There are millions of gaming apps, and when a studio resorts to a crowdfunding campaign for a project, it anticipates that its efforts will be recognized and supported by the community. Once again, marketing is crucial to guarantee the financing and commercialization of video games.

Choosing the right digital distribution business model for a video game is a decision that can have a significant impact on its success. In this section, we outline the different business models to consider when distributing a video game. There is no perfect option, and the final choice will depend on various factors, including the type of game, target audience, monetization goals and market trends.

Business model	Percentage
Usual	12–30 per cent of gross profits from sales of the game are retained by the platform. The remainder is distributed to the developer.
Developer + publisher	The market standard for developers ranges from 15–80 per cent.

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[31] Bramble, Ross. "How to successfully run a video game crowdfunding campaign." *gamemaker.io*. Feb. 13, 2023. <https://gamemaker.io/es/blog/how-to-run-a-successful-crowdfunding-campaign>.

5. Use of mobile apps in the side areas of industries: streaming/broadcasting of game content, e-sports and social media apps

👍 **The gaming industry has played a significant role in the proliferation of social media apps as influencers share their gameplay and game recommendations with audiences.**
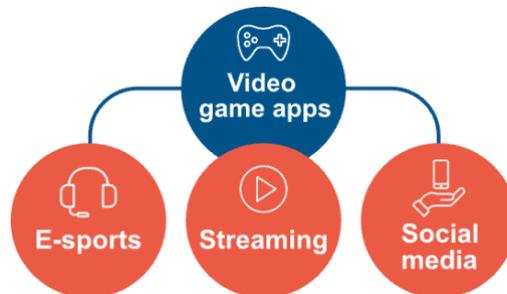

Figure 5 **Some of the main side areas of the video game industry** | Source: Authors.

New operators in the video game industry must understand that this sector, especially with regard to gamer behavior, is hard to predict. Video games are by definition meant to be played and many, especially those growing up in the last century, find it strange that young people also find it entertaining to watch others playing video games or prerecorded gameplay. The gaming industry has also, unintentionally, and until recently passively, played a significant role in the proliferation of social media apps, as influencers share gameplay and game recommendations with their audience, and generate content based on their favorite games.

Social media, online streams of gameplay and e-sports are the most relevant niche trends in this sector that, although not initially created or controlled by the gaming industry, nowadays generate millions of dollars in profits worldwide. In fact, although each is an independent phenomenon, they are highly interconnected, with the gameplay of e-sport competitions shared on social media networks and video-sharing platforms, or through social influencers streaming their gameplay to their followers. Extremely popular sites and companies such as Twitch, ESL, AfreecaTV and Discord have grown rapidly thanks to a loyal and devoted community of gamers,[32] with players streaming between three and five times per week, for at least two hours per broadcast.[33]

a. Streaming of game content

In the past decade, streaming of gameplay has become one of the most watched categories on platforms such as YouTube and Twitch. Gameplay is an audiovisual recording of gamers engaging in various aspects of playing a video game. It captures in-game action, interactions

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[32] According to Statista, a total of 5.71 billion hours were watched on Twitch in the third quarter of 2022.
[33] Nielsen, Troy. "The best time to stream on Twitch in 2023." *blog.hootsuite.com*. Hootsuite Inc. July 18, 2022. <https://blog.hootsuite.com/best-time-to-stream-on-twitch>.

and experiences as the game is being played. Once recorded, the gameplay is shared on one or more platforms, such as streaming services, video-sharing websites and social media.

There are many reasons for sharing gameplay, including: (1) entertainment – as bizarre as it may seem to some, many viewers use gameplay for entertainment, especially e-sports tournaments, as they can enjoy watching skilled and gifted gamers, similar to watching sport, (2) content creation – there are hundreds of content creators specializing in recording and editing gameplay to produce informative videos for their audiences, to comment, criticize or make fun of aspects of a given game, (3) learning – viewers may look at gameplay to learn how to play a video game, as it provides insights into game mechanics, strategies and hidden elements that users might not discover on their own, (4) purchase decision-making – watching gameplay can help potential buyers decide whether they want to buy a game, as they get a glimpse of the experience first, and (5) community building – gameplay can foster a sense of community among gamers who share similar interests in a particular game or genre, as they often discuss strategies and share experiences.

As we will describe below, uploading gameplay to the Internet can raise copyright concerns. Generally, however, video game developers and publishers tacitly permit such activity for different reasons, but fundamentally to foster a loyal and active community that will be the best judge of the game. Therefore, gameplay can be one of the most effective tools for word-of-mouth promotion; when financial resources are scarce, a small or medium-sized studio or publisher can rely on the viral capabilities of the Internet and promote sharing gameplay of its game to build a community around it.

This community usually provides valuable feedback and comments to the publisher, who can take advantage of such an informal assessment to improve the game, fix bugs or add additional features.

However, conflicts can arise when gamers monetize their activity, due indirectly to the video game, the rights to which belong to a third party. Gamers started to share their gameplay on the Internet in the second half of the 2000s, to show the world their skills and expertise in given titles. The increasing interest of an enthusiastic audience attracted the attention of sponsors and advertisers eager to connect with a younger generation.

In the past decade, gamers have monetized gameplay streams on different platforms. The most notable of these is the Twitch Partner Program, where gamers earn revenue from advertisers whose products or services are featured in broadcasts (before or during the stream, in the form of native advertisements or banners), and from user monthly subscriptions to the gamer's channel (generally, 5 US dollars per month, with half retained by Twitch), both of which are paid through the Amazon-owned company. When the community has grown enough, gamers (or twitchers, as they are also called) can seek other revenue streams, including the sale of custom apparel and merchandise, donations, book publishing or individual sponsorships with brands, to name a few.

In this context, mobile apps can be found in various forms. Advances in mobile technology have permitted gamers and streamers, mainly Google Android users, to stream their favorite games straight from their mobile phones, without the need for a desktop or a console. Gameplay streaming is demanding in terms of computing, storage and network connectivity, though today's top smartphones allow gamers to share, in real time, their gameplay with a worldwide audience.

For viewers, younger generations use mobile phones extensively to connect with their friends, post content and enjoy the information and videos published by others, including gameplay on Twitch or YouTube Gaming.

Both uploading and viewing this type of content on a smartphone is done through dedicated apps such as Streamlabs or Google Play Games. While the former allows users to stream games in real time, the latter is seamlessly integrated into the Google ecosystem (including Android and YouTube) to allow users to record, edit and post videos online. Apart from game streaming capabilities, all these apps have additional features, including chat rooms and community-building options.

Predictably, this practice is not 100 per cent safe from a copyright standpoint. Gameplay recordings can showcase different elements of a video game, including: the game's storyline, dialogue and plot developments; background musical compositions and recordings; and the actual graphic user interface, which includes icons, characters, vehicles, settings, maps and an endless number of artistic objects, all of which are potentially protected by copyright laws.

International conventions, treaties and national regulations grant copyright holders exclusive rights over their works and other protected subject matter, which means any use or exploitation must be approved in advance.

However, lawmakers in different jurisdictions have approved exceptions or limitations to these rights, including for private copying, the use of quotes and criticism and parody. In other territories, such as the United States, defense doctrines such as the fair use doctrine have proliferated. To some extent, this has become a standard on the Internet because of the global nature of this network and the influence of the United States in the video game and digital industries.

In the past, gameplay streaming has been the subject of copyright controversy not because of the opposition of video game developers or publishers but because of opposition from the licensors of certain assets contained in games. Today, it is rare for studios to create all the content of a video game from scratch, and they regularly resort to third parties to license certain elements of the game, including the software, sound effects, objects and soundtrack. As a result, the developer is the owner of the creative elements generated in-house and the licensee of those created by third parties, subject to the limitations set out in the relevant license agreements. In some cases, video-sharing sites such as Twitch and YouTube have removed gameplay after receiving cease-and-desist notifications, not from game publishers, but from the copyright holders of sound recordings.

Consequently, the streaming of gaming content can be a powerful tool for independent and large video game publishers to promote and advertise new releases and engage their community. The target audience for this type of product is consumers of game-related content, including Let's Play[34] and gameplay recordings. However, the streaming of video game content can raise copyright issues that must be analyzed before undertaking such activities to avoid copyright claims.

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[34] A type of video content in which a player records themselves playing a video game while providing commentary and narration.

b. E-sports

E-sports emerged in the 1980s[35] and refer to competitive video games organized and structured in a similar manner to traditional sports events. An e-sport competition involves professional players or teams competing against each other in video games, often in front of live audiences or online viewers. In the past two decades, e-sports have grown into a global phenomenon, attracting millions of players, spectators and significant investment from sponsors and advertisers.

There are several stakeholders in the sector who determine the rights and the chain of title required to commercialize certain elements of the e-sport industry, as follows:

1. **The organizers of the competition**: organizers have all the means, mainly economic and organizational, to enable the event to take place. They may be holders of trademark rights (over the distinctive sign used to identify the competition) and neighboring rights (over recordings made of the event), although, above all, they are licensees of the rights of third parties such as e-players, teams and, in particular, publishers.

2. **The teams**: video game competitions revolve around teams made up of professional gamers owned by the players themselves or, increasingly, by companies that have entered into contractual agreements with the organizers of the events, sponsors and the e-players to participate professionally in the competition. E-sports teams can also be original holders of trademark rights (over the team's name) and the image or publicity rights (of the e-players), but, like the competition organizers, they rely to a large extent on the rights to the video games owned by a publisher.

3. **The gamers or e-players**: the members of a team who compete in a video game competition. Gamers dedicate significant time and effort to perfecting their skills, training up to eight hours a day, five days a week. In terms of intangible rights, their image or publicity rights are usually exploited in the context of the competition.

4. **The broadcaster**: entity that streams or broadcasts an e-sport competition, either via the Internet, cable or terrestrial television. Broadcasters usually partner with the tournament or the league organizer to acquire the rights to the competition. We will not provide a detailed analysis of the rights to the competition but can state that to publicly advertise an event of this type, especially the images of the video game in question, it is necessary, at a minimum, to obtain the publisher's authorization.

5. **The publisher**: the most important stakeholder, as it owns the IP rights to the video game on which the competition is based, and, among other technical aspects, has access to and controls the servers on which it takes place. Until the 2010s, publishers were passive observers of this phenomenon, simply providing technical access to their servers to facilitate competition. In recent years, however, publishers have begun to set up dedicated e-sports departments to allow their games to be used in this context solely based on their commercial interests.

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[35] Larch, Florian. "eSports history: How it all began." *ispo.com*. The ISPO Group. Aug. 2, 2023. <https://www.ispo.com/en/sports-business/esports-history-how-it-all-began>.

The e-sports competition ecosystem is relatively complex and involves many different stakeholders. Despite their exponential growth in recent years, these stakeholders have been able to self-regulate efficiently and with little conflict.

The evolution and maturity of the e-sports sector have contributed to the development and availability of mobile apps of various genres. Almost every e-sports event organizer, team, broadcaster and publisher has their own app, though the most important may be Twitch, a video-sharing service with 140 million monthly active users, 7.12 million streamers and 31 million daily active users as of July 2023.[36] Almost every single gaming company, tournament organizer, publisher, content creator and e-sports enthusiast uses the Twitch app to enjoy streams, watch Let's Play and gameplay, and interact with the community, including with professional gamers and coaches, who are receptive and engage easily with their audiences. Examples of alternatives to Twitch include YouTube Gaming and Facebook Gaming, albeit to a lesser extent (in 2019, Google removed the dedicated YouTube Gaming app and integrated the content as an additional category in the general application).

Mobile apps are also widely used in the e-sports industry to allow fans to keep up to date with news and results from their favorite games, teams, players and tournaments. Apps such as Strafe allow users to customize their alerts to track live scores, news and updates about teams and games.

Another trend that has emerged from professional e-sports is amateur competitions and tournaments. Just like professional gamers, casual players can take part in e-sports events, and compete for a prize, or just the glory. Instead of playing alone or against a computer, amateur gamers can now compete from their smartphones with other players. Battlefy, Stryda and Gamersfy are platforms with mobile apps that allow home gamers to organize e-sports competitions or join tournaments arranged by the app owner. These services offer the most popular games, such as *Valorant*, *PUBG*, *League of Legends*, *Dota 2* or *Counter-Strike: Global Offensive* (CS:GO), for which they need to access certain elements of the game in some way, often via an API, which is subject to a license agreement. As we have seen, almost all the video games for which competitions exist are for personal computers, with some exceptions, such as *Candy Crush* and *Clash of Clans*, two mobile games developed by King and Supercell, respectively.

In the e-sports sector, mobile apps frequently showcase events in video game competitions. These are, therefore, hubs of relevant data, videos, images and related information about e-sports tournaments, teams, players and gameplay, content that can be protected by IP rights. An entrepreneur who wants to launch an app for the e-sports sector must take account of the legal protection of streams, audiovisual recordings and player publicity rights, and information if it is part of a database protected by local laws.

c. Social media

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[36] Ruby, Daniel. "Twitch Statistics 2023 – (Users, revenue and insights)." *demandsage*. Aug. 2, 2023. <https://www.demandsage.com/twitch-users/>.

In the past two decades, social media platforms have become a ubiquitous part of modern life for young people, connecting individuals and creating virtual communities across the globe. Platforms such as Facebook, X (formerly Twitter) and Instagram enable people to share thoughts, experiences and multimedia content instantaneously. Others, including Discord or Reddit, are more suitable for gamers, and video-sharing sites with social media functionalities such as Twitch and YouTube create robust communities of passionate video game fans. The relationship between social media, e-sports and gameplay streams runs deep, to the extent that major platforms such as Facebook allow users to play some casual video games on its platform and mobile app.[37]

The use of video games in social media apps comes in different forms, as follows:

1. **Social integration in games**: many video games such as *Fortnite* incorporate social features (chat and voice messaging) that allow players to connect and interact with their friends or other players within the game. This integration often leverages existing social media platforms, enabling players to invite friends to play together or communicate while gaming.

2. **Sharing of game-related content**: in recent years, social media platforms have become primary channels for gamers to share their gaming experiences, posting gameplay clips, screenshots and in-game content on platforms such as Facebook, X and TikTok.

3. **Live streaming and e-sports**: social media platforms such as Twitch and YouTube Gaming serve as hubs for live streams of games and e-sports events. Professional and amateur gamers use these platforms to broadcast their gameplay, connect with viewers and build dedicated communities around their content and brands.

4. **Marketing and promotion**: video game developers and publishers are embracing the endless possibilities of social media platforms as marketing tools, especially for projects with limited resources, where they rely on the viral capacity of these networks. Publishers and developers share game trailers, teasers and announcements, and engage with influencers to build awareness directly with their target audience.

5. **Gaming influencers**: influencers and content creators review games, provide tips and tutorials, and share their experiences, potentially shaping the popularity of certain games.

6. **Gamer engagement and feedback**: social media facilitates the publication of comments, suggestions and criticism, and allows direct communication between game developers and players, who can provide feedback, suggest improvements and report bugs, while developers can respond and inform the community about upcoming changes.

7. **Competitions and events**: social media platforms help promote gaming competitions, tournaments and e-sports events. They serve as channels for updates, live scores and highlights, engaging fans and encouraging participation.

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[37] More information is available on the Facebook website, https://www.facebook.com/games/instantgames.

Most publications on social media platforms such as TikTok or Twitch are posted by individuals who mix their own creations with content from their favorite video games, sometimes using tools available in their own game, though mostly this is achieved outside the publisher's control. This is known as user-generated content (UGC), a highly controversial phenomenon in the creative industries, especially in the music business, and to a lesser extent in the video game sector, given UGC often includes copyrighted material such as music, graphics or cinematics without proper authorization.

UGC has been addressed differently in territories such as the European Union and the United States. In 2019, the European Parliament approved Directive 2019/790,[38] with Article 17 establishing that online content-sharing service providers perform an act of communication to the public or an act of making available to the public when they give the public access to copyright-protected works or other protected subject-matter uploaded by their users. In these circumstances, the providers must obtain authorization from the right holders of the relevant works, for instance, through licensing agreements, with exemptions if certain requirements are met.

In the United States, meanwhile, no specific legislation has been enacted. However, some uses of existing works, such as remixes, mashups and memes, may be legal if they can be considered pastiches when posted for criticism or review purposes, or if they are parodies of the video game. In other cases, the platform may receive a notice and takedown requesting the removal of the content uploaded by the user. Social media networks such as Facebook and TikTok usually respond diligently by removing the content, and if the same user receives multiple notices, their account may be temporarily suspended or permanently canceled.

Additionally, some video game publishers worldwide permit, in their terms and conditions, certain uses on social media by gamers, including for commercial purposes, by businesses or to obtain financial gain. Unfortunately, the legality of UGC does not have a universal rule applicable to all situations. Thus, before posting content on social media that includes copyrighted portions of a video game, users should analyze the post itself, and the terms and conditions of the video game in question, and its legal framework to avoid problems with video game publishers or developers.

d. What you need to know about side industries

Side-area	Please note that:
Streaming	Conflicts can arise when gamers monetize their activity, as there are rights that belong to a third party. Gameplay recordings can showcase different elements of a video game, including the storyline, dialogue and plot developments, background musical compositions and recordings, and the actual GUI.
E-sports	These competitions are a hub of relevant data, videos, images, teams, players and other material that may be protected by IP rights.

[38] *Directive (EU) 2019/790 of the European Parliament and of the Council on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC*, April 17, 2019. Official Journal.

	An entrepreneur seeking to launch an app for the e-sports sector must take account of the legal protection of streams, audiovisual recordings, player publicity rights, and even certain information if it is part of a database protected by local laws.
Social media	Social media is based on UGC, a controversial phenomenon in the creative industries, especially in the music business and, to a lesser extent, the video game sector, as UGC often includes copyrighted material such as music, graphics or cinematics without proper authorization. European legislation has set a tight standard for the use of third-party works.

6. Legal and business aspects of games with social functionalities

👍 **Social platforms and gambling are two new crosscutting modalities in the video game industry. The legal implications of both models go far beyond standard video games.**

Figure 6 **The two sectors have a great intersection with video game apps** | Source: authors.

a. Video games as social media platforms

The video game sector is becoming increasingly crosscutting in respect of both consoles and apps, and individual and collective gaming. This is increasingly newsworthy, given it has the potential to combine the advantages of video games with the user's participation in social media. Although neither such interaction nor the option of simultaneously competing against other gamers is new to the sector, social networks have greatly expanded the possibilities. In fact, social media platforms have created new social business models within video games; for example, Twitch and YouTube have become major platforms for watching, among other things, gameplay and audiovisual content that did not exist just a few years ago.

The combination of social networks and video games is relatively new. The advent of smartphones and touchscreens, which has allowed for exponentially greater usability of these devices, made them a perfect combination for social media and video games. As a generic social media platform, Facebook has had the greatest success in the video game industry, especially among casual gamers. In parallel, other services such as Steam, Fortnite or Roblox had real video game companies behind them, creating platforms that perfectly fit the needs of hard-core gamers.

Steam is a platform designed directly for the distribution of video games and allows some features typical of social media platforms. In fact, it defines itself as "the ultimate destination for playing, discussing, and creating games", and has millions of users and active players,[39] who access the service via the desktop client or the mobile app. Steam is an example of the paradigm shift. It was created by Valve Corporation, a company that started out developing phenomenally successful games such as Half-Life in traditional formats, and now owns a clear leader in video game distribution. Steam includes several social features, including alerts that show if a friend is playing a particular game in their Steam library, notifications of events and new releases, and the ability to stream games from the user's PC to phones, tablets and TVs, depending on the availability of a good connection.

One of the most successful video games of all time, which also has a mobile app version, is Fortnite. It can trace its history to 2011, a time when social networks were still expanding. The game was relaunched in 2017 after many improvements to the gaming experience,[40] especially through the addition of social components. Fortnite is now used by gamers as a platform for

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[39] More information is available on the Steam website, https://store.steampowered.com/about/.
[40] Kobek, Patricio. "The history of Fortnite." *thegamer.com*. Aug. 16, 2019. <https://www.thegamer.com/fortnite-history-explained/>.

social interactions in several ways: (1) in-game communication, as the app offers voice and text chat features, allowing players to communicate with their friends or other players in real time while playing, (2) squad play, with Fortnite's Battle Royale mode encouraging players to team up with friends or other players in squads, (3) virtual hangouts, with some players using Fortnite as a virtual hangout space, similar to other instant messaging apps such as WhatsApp, (4) events and collaborations, with Fortnite regularly hosting in-game events and collaborations with pop culture franchises, such as concerts, movie screenings and limited-time game modes;,(5) social media integration, as many gamers share their Fortnite experiences on social media platforms such as YouTube, Twitch and Instagram, and (6) trading and gifting, with Fortnite's cosmetic items able to be traded or gifted between players.

These social interactions, along with massive usage (benefiting from a network effect[41]) and the processing of a gamer's personal data, allow publishers and platform owners to create a much more personalized experience.

Today, developers and publishers take the data obtained from these apps to analyze user interactions, including demographics, gender and age, to develop products and services with game mechanics adapted to their tastes.

This requires a certain technical and legal synchronicity between the video game and the social network.

From a technical point of view, users demand a seamless experience, which requires developers to create apps that are fully adapted to the requirements of the social network and the environment in which the supporting application will be developed (iOS, Android and others). But regarding the legal use of video games, developers will not only have to consider the legal requirements that may be imposed by the owner of the relevant app store but also be limited by the terms and conditions of the social network or platform in which the game is integrated.

Consequently, when a developer creates a game that will be available on Steam, Facebook or any other platform with social features, it must anticipate the terms and conditions established by the social network to avoid conflicts; for example, in the monetization model the former has planned for the app. There may also be other regulatory restrictions, as in the European Union, where a new strict regulation on platforms has recently been enacted in 2022 to balance the interests of users and the owners of these marketplaces. This regulation will be described below.

b. Video games and gambling games

Though they share etymological origins and are related activities, gaming and gambling have been traditionally different in nature, purpose and outcome. As described in the earlier sections, gaming refers to activities that involve playing games for enjoyment, entertainment, skill development and social interaction. The aim is to have fun, challenge oneself, engage in competition and, often, improve competencies through practice and strategic thinking. The outcome of gaming, whether a player wins or loses, is typically not directly tied to financial gain. Gambling on the other hand involves betting or wagering something of value on an uncertain

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[41] The concept of the network effect pertains to scenarios where the worth of a product, service or platform is influenced by the quantity of buyers, sellers or users engaged with it.

event in the hope of winning something else of value. People who engage in betting or gambling activities may have the primary objective of winning money or other items.

Unlike gaming, gambling is characterized by risk and the potential for financial gain or loss; it involves chance and luck, with skill and strategy most often incidental to the activity.

The line between gaming and gambling can sometimes become blurred, especially in cases where gambling apps have an aesthetic like that of a video game, with animated characters and colorful scenes, among other factors, or when gaming apps include randomized mechanisms such as loot boxes, microtransactions and virtual currencies.

Additionally, there has been a significant shift in the video game industry in the past decade due to the popularity of gaming apps, which blur things to an even greater extent. Notably, the industry has transitioned from a traditional model of selling off-the-shelf, where consumers purchase games for a fixed price, to a service-oriented free-to-play model, where publishers monetize games via microtransactions. The impact of this funding model is significant as microtransactions may involve elements of gambling, introducing the use of real-world money as a central aspect of these games. As a result, games with gambling elements have adopted a more video game-like nature, while video games increasingly employ gambling systems to generate profits.

Further, the advent of pay-to-win options that allow players to buy powerful in-game items or enhancements for experience and survivability has reshaped notions of merit within video game culture. Conventionally, games rested on the belief that all players operated on an equal playing field, with success determined by skill honed through practice and strategic thinking. The introduction of these controversial features is viewed by some as eroding this ethos while bringing gaming apps closer to gambling regulations.

These two sectors may converge in four key areas,[42] creating a closer relationship than ever before:

1.   e-sports betting, in which players wager on the outcomes of competitive video game contests using digital items with real-world value or actual currency.

2.   Loot boxes, whereby players spend real money to acquire digital assets (skins, weapons, among other things), yielding an uncertain assortment of items when opened. Although these items can enhance a player's gameplay abilities or social standing, the acquisition of desired items before the purchase of the loot box remains uncertain.

3.   Daily fantasy sports, which is a form of online gambling designed to mirror the aesthetic, mechanical and thematic elements of sports management video games, often using real money.

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[42] Johnson, Mark R., and Tom Brock. "How are video games and gambling converging?" *greo.ca.* Gambling Research Exchange Ontario. Jan., 2019.
<https://www.greo.ca/Modules/EvidenceCentre/files/Johnson%20and%20Brock%20(2019)%20How%20are%20video%20games%20and%20gambling%20converging.pdf>.

4. Gamblification of live-streamed video game content, characterized by incorporating gambling features into live broadcasts such as online poker, and the employment of gambling techniques to solicit donations from viewers.

This has led to debates about whether certain game mechanics may encourage gambling-like behavior that may fall under gambling regulations. In fact, while the gaming industry is primarily self-regulated, activities are highly regulated across jurisdictions. Gambling regulations vary widely from country to country, and jurisdiction to jurisdiction. Activities based on chance, where players risk real money, may be fully legal, partially regulated or prohibited in different regions. Many jurisdictions require operators to obtain licenses or permits to offer gambling services, including via apps, and gambling regulations often include provisions for consumer protection, responsible gambling measures and resources for those with gambling problems.

If the game mechanics of a mobile app include an element of chance, or if microtransactions are used to monetize a game, video game developers must understand the specific regulations and laws governing gambling in their region and in the territories where they intend to market the mobile app, as these can have significant legal and financial implications.

c. What you need to know about social functionalities

Modality	Please note that:
Video games as social media platforms	Social interactions and the processing of a gamer's personal data, allow publishers and platform owners to create a much more personalized experience. It is important for developers to anticipate the terms and conditions established by social platforms.
Video games and gambling	Gambling regulations vary widely from country to country and jurisdiction to jurisdiction. Many jurisdictions require operators to obtain licenses or permits to offer gambling services, including via apps, and gambling regulations often include provisions for consumer protection, responsible gambling measures and resources for individuals with gambling problems.

7. Video games pushing the boundaries: when gaming serves purposes other than entertainment

👍 **Video games are increasingly being used for purposes other than leisure and entertainment. Health and education are two of the main areas where they can have a big impact.**
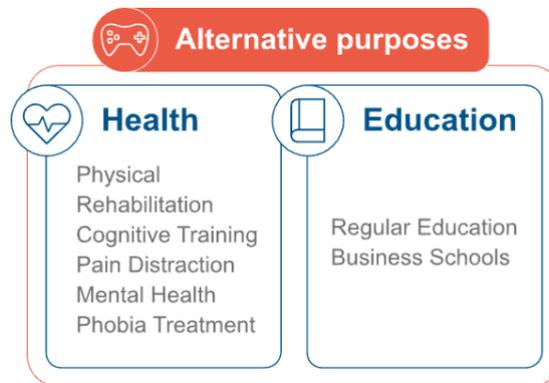

Figure 7 **Video games can serve as many purposes as developers and editors determine** | Source: authors.

Due to their interactive nature, accessibility and potential for engagement, video games are increasingly being used for purposes other than leisure and entertainment, including various health-related applications. In the past decade, brain training games, such as Nintendo's Big Brain Academy, have focused on engaging middle-aged and older individuals to prevent or combat age-related cognitive decline through methods that involve brain training. Apps with specialized game mechanics have been identified as an appropriate tool to assist individuals of various ages who require ongoing neurological rehabilitation. By combining a smartphone or virtual reality device with traditional rehabilitation methods, patients can enhance their recovery process and independently control its pace from the comfort of their own homes.

These programs include gamification techniques that consist of incorporating elements commonly found in games such as competition, rewards, challenges and interactive experiences into non-game contexts to enhance engagement, motivation and participation. Essentially, this involves applying game-design principles to activities or processes that are not inherently games. These mobile apps, created by cross-disciplinary teams of doctors, physicians, therapists, neurologists, physiotherapists and game developers, are designed to help people with physical and mental conditions in a variety of ways. The games serve the following functions:

1. **Physical rehabilitation**: mobile apps, along with specialized devices, can be used as part of physical therapy to aid in motor skill and mobility recovery. These games can encourage patients to perform exercises and movements in an enjoyable and motivating way, which can be particularly effective for those recovering from injury or surgery.

2. **Cognitive training**: certain video games are designed to test and train cognitive functions, including memory, concentration, problem-solving and reasoning. They can be beneficial for individuals with cognitive impairments or neurodegenerative conditions such as Alzheimer's disease.

3. **Pain distraction**: games can serve as a distraction technique for managing pain and discomfort during medical procedures or treatments. Engaging gameplay can help patients divert their attention away from pain, potentially reducing the perception of discomfort.

4. **Mental health**: mobile apps are being explored as tools for managing mental health conditions such as anxiety, depression and stress, while others are designed to promote relaxation, mindfulness and emotional regulation.

5. **Phobia treatment**: virtual reality games are being used to expose individuals to controlled environments that trigger phobias, allowing them to confront and overcome their fears.

In addition, smartphone and console applications have been used to improve physical fitness. By combining the appeal of video games with the benefits of physical activity, some innovative approaches are making exercise more enjoyable and accessible, thus helping individuals maintain a healthier lifestyle. Modern smartphones have a significant number of sensors that, together with motion control games, allow players to track physical movements to control on-screen actions. Games such as Wii Fit, Just Dance and Kinect Sports encourage players to perform various exercises and movements, turning gaming into a physically active experience.

Exergaming, as it is known in the industry, combines exercise with gaming.

It involves using specialized equipment such as dance mats, balance boards or virtual reality setups to play games that require physical activity. These games often simulate sports, dance routines or other physical challenges to promote exercise and fitness. Finally, mobile apps such as the famous Pokémon GO encourage players to explore their surroundings by walking, jogging or cycling to find virtual creatures and items, promoting outdoor activity and exploration.

Games and applications have also been introduced into classrooms in recent decades to make the educational process more accessible and fun for children and young adults. This category of games can provide engaging platforms for learning about mathematics, science, history, geography, algebra or foreign languages. The games provide an interactive and immersive learning experience that engages students in active participation and presents information in an attractive way, making it easier for students to grasp complex concepts. In addition, the interactive features of these applications allow students to receive immediate feedback to identify areas that require improvement.

Elite business schools are also using games to simulate real-world situations so that students can hone their business skills without consequence or the pressures of the workplace. Games replicate authentic business situations, but any mistakes made during gameplay have no tangible risks or effect in the real world. Developers of this category of games recreate business scenarios, allowing students to make decisions, allocate resources and analyze results. Other applications focus more on approach, encouraging students to think critically and strategically to overcome challenges and achieve goals. These games help sharpen skills such as planning, forecasting and adaption to changing conditions. By experimenting with different strategies and observing the consequences, students gain practical insights into business operations and decision-making. These specialized applications can simulate managerial roles, allowing students to practice leadership, team management and problem-solving, helping them to develop skills critical to effective management.

Nowadays, gaming apps serve multiple purposes besides recreation. When specialized games are used in schools, hospitals, universities and rehabilitation centers, they can help professionals improve the training, learning or rehabilitation processes of students and patients. The games are created by a multidisciplinary team of experts, including lawyers, as due to the nature of these products, they may be subject to health regulations. The healthtech sector is investing significant resources in new products and devices, using techniques from other industries such as gaming to create innovative services and therapies that development studios can leverage to drive revolutionary technologies.

a) What you need to know about alternative purposes

Modality	Please note that:
Health	Video game apps have shown an important utility in the health sector, helping in a significant number of health areas, from mental health to physical rehabilitation.
Fitness	Video game apps are a powerful tool for guiding training. Exergaming combines exercise with gaming.
Education	Although gaming is not new for educational purposes, apps have widened the possibilities in the education sector.

8. New legal and technological challenges in the video game sector: from AI and the metaverse to platform regulations
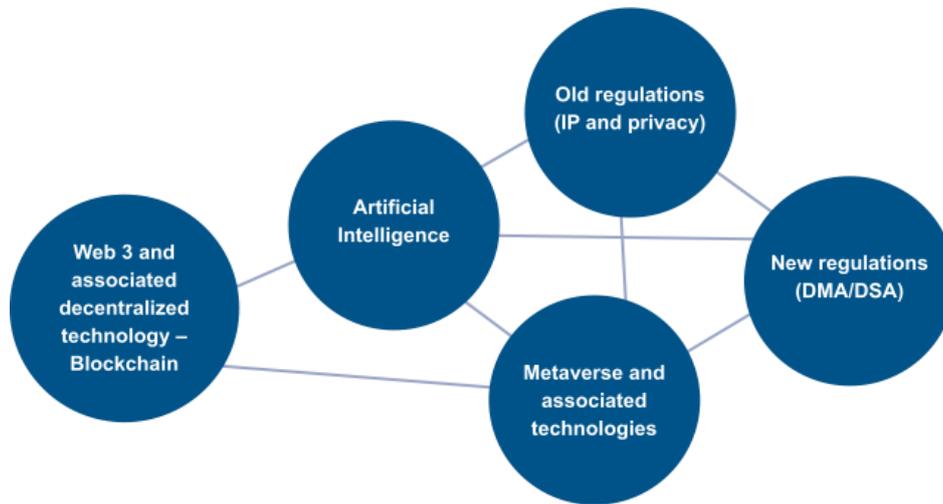

Figure 8 **Upcoming regulations in side areas of law may heavily affect video game apps, especially when European consumers are involved** | Source: authors.

The continual arrival of technologies are certainly a challenge for game developers. These technologies can offer new functionalities to gamers but also require constant adaptation in a fluid environment. The search for innovation and the development of new and disruptive technologies is also constant in the gaming industry. This occurs to such an extent that, as Gartner's Hype Cycle indicates (see fig. 9), technologies go through different stages in their commercial life, from a peak of inflated expectations phase to the plateau of productivity.[43]
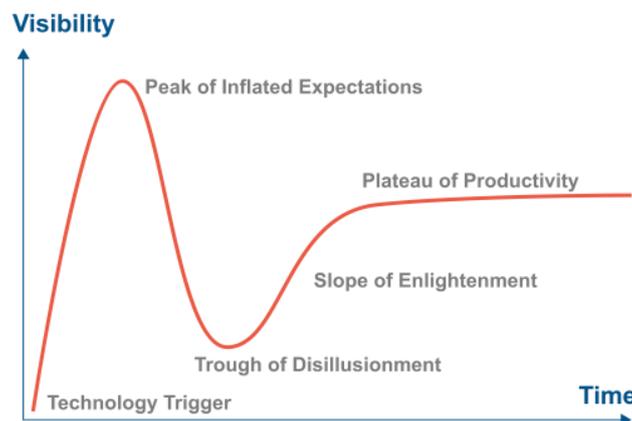

Figure 9 **Gartner's Hype Cycle** | Source: Authors.

Many technologies fall by the wayside or become obsolete prematurely.[44] Moreover, as some commentators have pointed out, many of these technologies do not add value because they are

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[43] More information is available on Wikipedia, https://en.wikipedia.org/wiki/Gartner_hype_cycle.
[44] More information is available on the Gartner website,
https://www.gartner.com/en/newsroom/press-releases/2022-08-10-gartner-identifies-key-emerging-technologies-expanding-immersive-experiences-accelerating-ai-automation-and-optimizing-technologist-delivery.

not disruptive; only those that achieve new outcomes, rather than simply improving existing processes, will be game changers. The rest will remain as enabling technologies.[45]

It is not hard to predict that the metaverse, AI and Web3 (decentralized web) will affect the video game sector in the short and medium term, by opening up huge possibilities from a technical point of view, but also by requiring developers to comply with laws that did not previously exist.

The regulatory frameworks associated with these technologies, specifically with Internet platforms, are becoming increasingly stringent.

As we will see, the European Union, for example, has over the past decade undertaken a series of ambitious regulatory programs that have had a major impact on the digital sector, including video game studios and publishers. This has the potential to prompt similar regulations globally, as has already happened with the General Data Protection Regulation (GDPR),[46] the application of which has led companies around the world, whether required to comply or not, to adopt many of its principles.[47]

This is just one of many examples such as the Digital Services Act (DSA) and the Digital Markets Act (DMA),[48] or the future regulations on AI being prepared by the European Union,[49] which, like the GDPR, will apply to all companies doing business in Europe, regardless of where they are located. This mix of new technologies and regulations creates opportunities for mobile app developers but also raises the bar regarding compliance with laws that protect the freedom of markets and individuals.

The combination of technologies and regulations deserve attention in aspects that we have identified as particularly important in both respects. These will be briefly analyzed below. From a technological point of view, we will focus on the metaverse (as a concept) and AI, while from a legal standpoint, the DSA and the DMA, the new European regulation of platforms, will be examined

a. The metaverse

The metaverse[50] has been described as a "massively scaled and interoperable network of real time rendered 3D virtual worlds and environments which can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and

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[45] The original distinction was between disruptive innovations and sustaining technologies, as originally described by Professor Clayton Christensen. See IBA Legal Policy and Research Unit. "'Times are a-changin': Disruptive innovation and the legal profession." *ibanet.org.* International Bar Association. 2016. <https://www.ibanet.org/MediaHandler?id=2C42BEFA-DDC4-4EF5-BDD5-41FA502B987B>.

[46] *Regulation (EU) 2016/679 of the European Parliament and of the Council on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC*, Apr. 27, 2016. Official Journal L 119. Article 3.1 provides that "this Regulation applies to the processing of personal data in the context of the activities of an establishment of a controller or a processor in the Union, regardless of whether the processing takes place in the Union or not".

[47] For example: "There have been more positive global responses. Microsoft has said it will extend the user rights enshrined in the European regimes - like transparency and the right to ask for personal information to be deleted, or to take it elsewhere - globally." See Waters, Richard. "Europe sets a high bar on privacy with GDPR." *The Financial Times*, May 24, 2018.

[48] Regulation (EU) 2022/2065 of the European Parliament and of the Council on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act). Oct. 19, 2022. Official Journal L 277.

[49] European Commission. *Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts*. COM (2021) 206 final.

[50] Although the concept of the metaverse is associated with Meta (formerly Facebook), this guide uses the term in a generic way, with lowercase letters except when referring to the Meta company.

payments".[51] In short, it will be a network of interconnected virtual worlds where users will be able to interact socially and financially, and which will leverage many aspects of the gaming sector. Despite the significant media focus, the metaverse does not yet exist and is still far from being a reality, especially in the manner depicted by certain media outlets. This is predominantly due to the substantial computing demands and the need for established protocols, which are essential prerequisites for its effective establishment.

Returning to Gartner's Hype Cycle and its study of trends driving near-term adoption of metaverse technologies,[52] six major technologies were identified, namely, gaming, digital humans, virtual spaces, shared experiences, tokenized assets and spatial computing. As we have seen, the video game industry is strategically positioned to shape the metaverse.

In fact, this sector has been gradually progressing towards establishing a virtual, immersive and enduring environment to potentially complement or even coexist with the World Wide Web.

KKR and Sony, both key players, have invested over a billion dollars in Epic Games, the publisher behind Fortnite and the Unreal Engine game engine. This move has been widely interpreted within the industry as a fundamental step to building the metaverse's foundation. Naturally, the creators of game engines such as Epic, Unity (which owns a game engine of the same name) and RAGE Technology Group (owned by Take-Two Interactive and responsible for the engine in the Grand Theft Auto series) are well positioned to lead the competition for metaverse governance.

The legal implications of the metaverse extend in all directions and many are now demanding regulations for this new virtual environment, including in copyright, trademarks, publicity rights and other related digital areas such as cryptocurrencies, e-commerce and consumer rights. In the metaverse, avatars under the control of humans or computers will possess the capability to manipulate virtual objects like vehicles, weaponry or furniture. Regarding IP rights, conflicts may arise if developers include third-party rights such as trademarks or copyrighted content in these objects.

As IP laws encompass the intangible elements (*corpus mysticum*) of objects, whether physical or virtual, it becomes evident that metaverse developers must uphold the rights of creators, designers and proprietors of distinctive signs just as in the physical world. Consequently, a right holder will retain the right to act against any infringement of their IP rights within the metaverse. This extends to scenarios where their rights are linked to virtual assets, such as digital avatar accessories such as virtual purses or clothing items.

In most cases, the regulation will not be specific to the metaverse since these issues apply also to other aspects of life and the economy.

In fact, throughout the past three decades, nations with a robust online presence have formulated fresh regulations to tackle matters such as e-commerce, tech-related criminal

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[51] Ball, Matthew. *The Metaverse and How it Will Revolutionize Everything.* New York: W. W. Norton, 2022.
[52] Gartner. "Gartner outlines six trends driving near-term adoption of metaverse technologies." *gartner.com.* Sep. 13, 2022.
<https://www.gartner.com/en/newsroom/press-releases/2022-09-13-gartner-outlines-six-trends-driving-near-term-adoption>.

activities, consumer rights around digital content and the liability framework governing Internet service providers, among other areas.

With copyright, for example, as the metaverse will be entirely digital, software protection regulations will be paramount. In a 2022 study, the European Union said it did not foresee the metaverse having any special characteristics in this respect.[53] A further issue is the digital and intangible content that will be created in the metaverse, by professional studios and amateur gamers, such as video game characters, maps, buildings and vehicles, which may also be eligible for protection. In most cases, the current creative content protection regime will be fully applicable to the metaverse.[54]

b. Artificial intelligence

At a time when generative AI has entered public debate, it is important to remember it also has applications in the world of video games, which are not new. As described in section 2, the first video games were released in the 1950s and already included non-player characters (NPCs), or virtual people, creatures or objects, not controlled by a human player but by the computer, with some degree of intelligent response. During this time, app developers have used AI to control game characters and analyze player behavior data, and now generate game content that will radically change this and many other industries.

Generative AI services permit the automatic creation of graphics, musical works, sound recordings, drawings and computer code, among other things, through prompts (that is, natural language inputs that transmit commands with the objective of achieving a result, whether text, images or video, depending on the service). When a user instructs the generative AI-based system, it interprets the commands according to different parameters and produces one or more results.

It is often claimed that the results provided by generative AI are not protected by copyright because they are not created by a natural person, which is a common requirement for protection. This lack of protection is true in most cases, especially when those who control a generative AI system are home users or non-professionals. But an AI system, like any other tool, allows more complex and even conversational uses with it, creating a true creative process controlled by the operator of the generative AI. In different jurisdictions, copyright registries[55] are coming to this conclusion, allowing the registration of rights in works created using generative AI if the applicant proves there was a creative process behind it, thus confirming the status of these intelligent systems as tools. In other cases, the content generated by an AI system is unprotected, and therefore, in the public domain.

As noted in the introduction to this section, the European Union is working on a regulation for AI systems, including the technology itself and liability for the use of various AI systems. The first of these, and the most relevant, places AI systems into three different categories, prohibiting activities that have significant potential to influence individuals unobtrusively using subconscious

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[53] European Innovation Council and SMEs Executive Agency. "Intellectual property in the metaverse. Episode IV: Copyright." *intellectual-property-helpdesk.ec.europa.eu*. European Union, Jun. 30, 2022. <https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/intellectual-property-metaverse-episode-iv-copyright-2022-06-30_en>.
[54] Ramos, Andy. "The metaverse, NFTs and IP rights: To regulate or not to regulate?" *WIPO Magazine*. June, 2022. <https://www.wipo.int/wipo_magazine/en/2022/02/article_0002.html>.
[55] Brittain, Blake. "U.S. Copyright Office says some AI-assisted works may be copyrighted." *reuters.com*. Mar. 15, 2023. <https://www.reuters.com/world/us/us-copyright-office-says-some-ai-assisted-works-may-be-copyrighted-2023-03-15/>.

methods, or to exploit the vulnerability of certain groups, such as children or people with disabilities. The mobile app industry will be tangentially affected by this regulation due to its intensive use of new technologies and the target audience of its products. When the new regulation comes into force, risk assessment analysis will be commonplace in the use of AI in gaming apps, as it is today for the processing of personal data.

c. New regulations

Regarding the regulation of Internet platforms, we must look to the European Union and the new context that has created by the DMA and the DSA, which also apply to video games and mobile apps when available on large platforms.

Under the DSA, the European Union seeks to regulate, among other things, the services of digital companies acting as intermediaries, whether they are platforms in a commercial sense or not. Although it includes certain specific obligations for very large online search engines (VLOSE) and very large online platforms (VLOP),[56] the European Union is concerned how Member States deal with illegal content, online disinformation or other risks for society. This regulation introduces a multitude of due diligence obligations that providers must apply whenever they offer a service to EU citizens.

The DMA, on the other hand, aims to contribute to the proper functioning of the internal market by laying down harmonized rules ensuring the existence of contestable and fair markets in the digital sector across the European Union for all businesses where so-called gatekeepers are present. The introduction of the concept is significant. Article 2 of the regulation defines a gatekeeper as an "undertaking providing core platform service". This includes online intermediation services, online search engines, video-sharing platforms and online social networking services, all of which are likely to be linked to video games offered through the platform; thus, this regulation will affect the mobile app sector.

In conclusion, it is undeniable that the metaverse, Web3, the platform economy, AI and many other technologies will pose numerous challenges to IP right holders that are unpredictable at this stage. However, the core foundations of IP rights, from international treaties and conventions to national regulations, have proved to be highly resilient to technology. New devices and systems must be built with respect for the existing rules, which have been carefully crafted through extensive deliberation across different countries and cultures. They have been tested in various scenarios and have proved their effectiveness over decades. While adjustments will undoubtedly be needed in the coming years to effectively govern human interactions in digitally connected domains, they should be based on a full understanding of the challenges that may arise, while respecting the principles that have been in place for centuries.

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[56] More information on affected lenders is available on the European Union website, https://ec.europa.eu/commission/presscorner/detail/en/IP_23_2413.

9. Conclusion

Mobile apps have proved to be a success story. Not only do they provide a great entertainment experience but also enable many other daily activities. Gamification means being able to extend the experience to areas such as culture or health. In addition, the ability to use video games through apps allows users to enjoy them anywhere, anytime, without having to rely on consoles as they did in the past. Simply put, a smartphone can be the perfect device for a video game and can provide the best experience for games with specific game mechanics.

Apps are complex multimedia systems consisting of computer code, text, images and sounds, in combination with GUI, databases, functionalities, APIs and background infrastructure.

In this guide, we have described how game app developers can protect all or some of these elements using the legal resources that national and international IP rights provide to creators and producers. If the requirements are met, they will have exclusive rights to their works, and will be entitled to act against any reproduction, distribution, public communication or creation of a work derived from their content. However, because mere ideas are not protectable, essential aspects of applications such as game mechanics will be free for use by third parties.

Other alternative resources available to app developers are trademarks, which protect the distinctive signs associated with game products, and trade secrets and nondisclosure agreements that prevent the disclosure of information relevant to the studio and give it some advantage over competitors. Finally, experience shows that patents and industrial designs can also play a role in this sector, as they protect the innovative technical aspect of an invention, and the unique visual and aesthetic features of functional products, such as the shape, configuration, ornamentation or surface decoration of physical and virtual objects, against unauthorized copying or imitation of designs.

Further, when using third-party content in the context of game applications, developers must obtain prior consent from the right holders, unless an exception or limitation to the exclusive rights applies or the work is in the public domain.

All the above apply to different app business models. Among the most popular are paid apps, free-to-play (F2P) with in-app purchases (IAP), freemium, subscription, ad-supported, pay-to-win, loot boxes and gachas, sponsorship, cross-promotion and partnerships, and crowdfunding, among others. The possibilities for app developers to successfully market and monetize their games are endless.

Nor should we forget that video games have spawned increasingly successful ancillary businesses. Live streaming, broadcasting, e-sports and social media applications are new phenomena that have emerged under the umbrella of video games.

In particular, streaming is becoming even more popular due to applications such as YouTube and Twitch, which allow the monetization of the broadcasting of own or third-party games, while e-sports are becoming increasingly institutionalized. These models coexist with models such as social networks and video games, which have allowed a great expansion of the business model due to the viral capacity that social networks allow. Games such as *Fortnite* or *Angry Birds* are a good example of how social networks can be a springboard for spreading video games to a

different audience than the traditional one. Something similar can be observed in the gambling sector. The line between gaming and gambling can sometimes be blurred, especially in cases where gambling apps have an aesthetic like that of video games.

In addition, the emergence of technologies such as AI, the metaverse, augmented reality and virtual reality is once again opening enormous possibilities for video game applications. In this context, current regulations are largely applicable to these new technologies, with some adaptations, leaving app studios to navigate an increasingly complex regulatory framework. Now more than ever, it is essential to seek legal advice to anticipate risk and avoid future pitfalls.

All in all, video game apps represent a great opportunity for developers from any country in the world who want to reach a global audience, and IP regulation is the perfect tool to protect the investment, creativity and talent of those exploring new opportunities in this sector.

a. What you need to know about new regulations

Modality	Please note that:
Web3	Is not a technology or a piece of regulation. It refers to the immersive kind of web that will follow the social web we enjoy today and will be based on decentralization and technologies such as blockchain. This may entail several conditions depending on each national regulation.
Metaverse	Like Web3, it is not a technology or a piece of regulation in itself. However, as a massively interoperable network it can entail a large number of applicable regulations, depending on national regulatory frameworks.
Artificial intelligence	Europe is leading the regulatory efforts to enact new rules now that AI is emerging as global technology. Other regions such as the United States and Asia will follow shortly. Regulations may establish hard conditions for AI systems.
Other important regulatory measures	Europe has enacted important regulations such as the DSA and the DMA, which tend to regulate the power of big platforms and their responsibilities, as well as set rules for fair and contestable markets within the digital area.

10. The authors

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