Digital Transformation in the Gaming Industry

Igor Pihir, Ivan Kardašić
University of Zagreb Faculty of Organization and Informatics
Pavlinska 2, 42000 Varaždin, Croatia
igor.pihir@foi.unizg.hr, ikardasic@student.foi.hr

Abstract. *Digital transformation, as a new paradigm that shifts mind and changes businesses, is meant to allow an organisation to jump towards a more competitive, innovative and sustainable business model. DT paradigm is strategy-oriented and customer-centric; it is based on introducing organisational and technological changes in products/ services, business processes, and/ or business models by implementing contemporary information and communication technologies. DT is a paradigm of today's business and the new digital world. It is applicable across industries and present in all of them. This paper examines the changes in the video games industry, or gaming industry, marked as digital transformation, across the last 25 to 50 years. It explains pre-digitalisation, digitalisation and finally the digital transformation period, as a fine example or fine case study through time. Since this industry can provide evidence of DT in change of processes, products/services and business models or altogether, that makes it a very fine case study for digital transformation. The research was made on several examples of digital transformation of process, product or business model to visualise the change in every aspect and link examples of real products/services, business processes and business models.*

Keywords. digital transformation, video games industry, change, process, product, service, business model

1 Introduction

The gaming industry, or video games industry, relies on developing video games and supporting goods/ artefacts as a part of the creative and entertainment industry. Innovation of business models and gaining a competitive edge are mandatory for this rapidly developing and growing global industry.

The video games industry today spans PC computers, consoles, mobile devices, and handheld consoles. Key components of the industry include game development; publishing (both physical and digital); hardware (including consoles, handheld consoles, joysticks, steering wheels, peripherals, headsets and other accessories); esports and competitive gaming (gaming experience); and community and support services (additional internal society and roles around game titles) (Oguguo, 2024).

In the video game industry, two main players are key to bringing a game to market: the publisher and the game developer. Publishers finance and promote the game, while developers, who can be either independent individuals or large companies, are tasked with the actual game creation. Many publishers also have in-house or vertically integrated developer operations (Thomes, 2015). This brings the key element into the market, but all other elements, as stated before, like hardware, e-sports and competitive gaming, community, and supported services, are also an important part and a significant revenue source for the industry.

The evolution of the global video game industry is characterised by rapid technological innovation and changing business models (Özalp, 2024). Business model innovation (BMI) is crucial to enhancing competitive advantage, and our understanding of how organisations innovate their business model when pursuing contrasting goals (Micheli & Jansen, 2024).

Digital transformation (DT), on the other hand, is a new paradigm that shifts minds and changes businesses, is mented to allow an organisation to jump towards a more competitive, innovative and sustainable business model.

DT is fraught with challenges and disruptions (Tomičić-Pupek et al, 2023; Kutnjak, Pihir, 2025). It is strategy-oriented and customer-centric, and it is based on introducing organisational and at the same time technological change, in all or some of the fields as products/ services, business processes, and/ or business models by implementing contemporary information and communication technology (Pihir, 2022). DT is a paradigm of today's business and the new digital world. It applies across industries and is present in all (Kutnjak et al, 2019). Since the video games industry can provide evidence of DT in change of processes, products/ services and business models, or altogether, this makes it a very fine case study for digital transformation, which is a theme of this research paper. DT is also determined by determinants of digital transformation (Pihir et al, 2019), which will be connected to the video game industry at the conclusion, describing why it is a good case study.

This paper is structured as follows. Section II overviews the methodology and research aspects of the paper. Section III describes the gaming industry and video games trends brief overview. Section IV provides insights into the characteristics of digital transformation and results of the research according to digital transformation in the gaming industry by transformation of processes, products/ services or business models in subsections. Section V concludes the paper by providing a discussion about what are the advantages of such changes are, from the perspective of key determinants of digital transformation.

2 Methodology

The methodology and resources used in this research are based on real cases over time, examples, literature sources and real-world case studies based on the author's own experience or literature research, market studies, and professional and scientific literature that research the gaming industry and the entertainment industry, with a focus on the video games industry. Models made in the paper as scientific contributions are made on several video games industry history analyses combined with knowledge of the authors and personal experience in gaming and the field of digital transformation, making a differentiation and classification of periods and differences across the process, product/ services and business models across industry and period. Models as results of this research and developed by icons from Noun Project (2025) and by storytelling method described in (Tomičić-Pupek et al, 2019). All models are based on description from dependable literature review sources referenced before models in section 4. and subchapters.

3 Gaming Industry and Video Games Trends

The gaming industry trends and market shares per device division have been rapidly growing in the last decade. According to the DRDC article by Arlan (2022), referring to an IDC report from 2022, the video game market is growing in a linear trend. In 2014, it was at 30 billion dollars versus 222 billion dollars in the last reported year, 2022, and mobile platforms had a share of 60% of that cumulative revenue.

In Fig. 1 we can observe game industry market by devices in billions of dollars (Arlan, 2022), from 2014 till 2022, on all platforms: PC (personal computers, laptops and notebooks), mobile (mobile phones and tablets), home consoles (Sony PlayStation, Nintendo, etc.) and handled consoles (small, portable self-contained video game consoles like Game Boy, Switch, Steam Deck). Fig. 1 shows large growth, thanks to mobile platforms. PC and consoles. are in growth but very small, since the market here is at full strength. For example, as can be seen in Fig. 1, the PC video games market grew from 2014 to 2022 from 28 to 40 billion dollars, which is not bad, to a growth of almost 42% in the last 10 years. On the other hand, mobile phone and tablet video games went from 30 billion in 2014 to as much as 136 billion in the year 2022, which is a growth of 350%. That is tremendous growth, and it shows a large potential in the future. Similar growth shows also other reports specialised in this field (Grand View Research, 2025), and also Ernst & Young group reports from 2022 (Porter et al, 2022). predict not only financial growth figures till 2030 but also models of future gaming elements connected to more 3D and VR gaming.

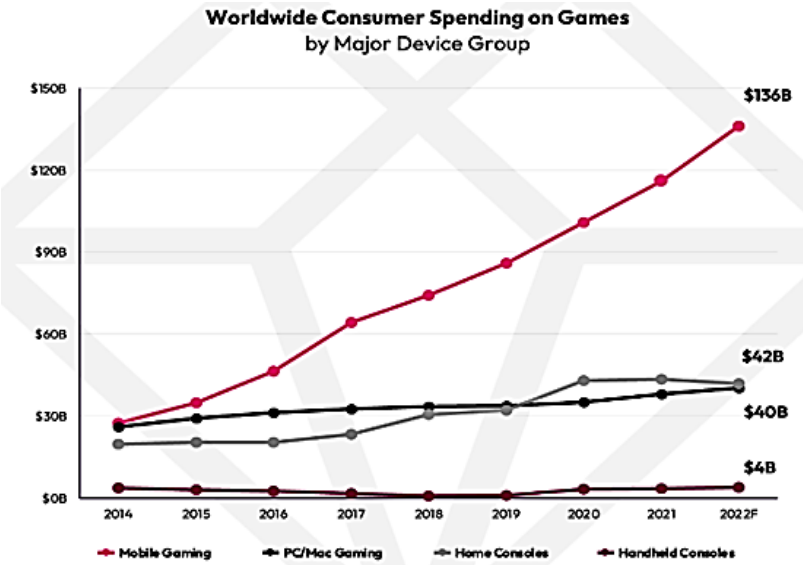

Figure 1. Game industry market by devices in billions of dollars (Arlan, 2022)

This industry reach is not only connected to video game development and publishing, which creates a large market in the entertainment industry, but it also boosts the need for buying the appropriate hardware, peripherals, and gadgets to support players' game experience and add visual, sound, and tactile elements to games, see illustration of this hardware in Fig. 2.

In that manner, for a gaming experience on any device (PC, console, mobile phone, handheld consoles), additional speakers, headsets, joysticks, VR glasses, steering wheels and other equipment are needed to make the experience closer to reality. In Fig. 2, all these assets are presented, and all of them make this industry more competitive since a lot of these peripherals are adapted for specific games or game series and console series. All of it adds value for customers and their customer experience.

Erst & Young future predictions study (Porter et al, 2022) presents that the evolution of gameplay itself will become more complicated, with a lot of new equipment made for games like VR and peripherals that some will be core to the new gaming experience. The use of haptic suits in gaming is also expected to grow significantly in the coming years, and overall wearable devices with sensors will provide feedback to users and collect input from their physical response to gameplay.

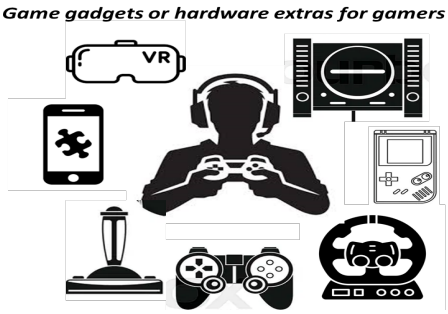

Figure 2. Game gadgets and hardware extras for gamers as additional sales boosters for gaming industry (authors)

Since the video game industry is very competitive and developer and groups of developers and publishers combine their products (games) and platforms (consoles and others peripherals) like PlayStation, Xbox, Nintendo or others are developing a community of players and sales not only games but also hardware and peripherals connected to group of games titles or platform series e.g., Nintendo Wii games. According to older research (Thomes, 2015), when this pre-digital transformation phase was active, Thomes stated that the industry exhibits strong cross-group externalities between software publishers and gamers. Console manufacturers are aware of these positive externalities and invest in first-party titles to make their consoles more attractive to gamers (games come to a certain console first, then are published with a delay on PC or other consoles.).

The video game industry is fragmented and generates significant economic benefits, for example, in the USA, Japan, Finland, Poland and other countries with a large video games industry. By Özalp (2024), diverse pathways to building video game industry clusters emphasise the role of cross-industry skill transfer, intellectual property, and government support. Where traditional video game industry hubs like the USA and Japan he a crossover of capabilities from the entertainment and hardware industries.

For example, this means that games like driving simulations, e.g., NFS, Formula 1, Collin McRae Rally make almost always a need for additional steering wheel, or in flying simulation games, e.g., MS Flight Simulator joystick is needed, or today a VR equipment for new editions. These peripherals make hundreds of dollars in addition to the game and make it more realistic.

4 Digital Transformation of Gaming Industry

Innovation in hardware, software, digital transformation and business models has redefined the boundaries of game development and player experiences (Oguguo, 2024). According to Piers Harding-Rolls, former Head of Games Research, “The gaming industry has benefited hugely from the mainstream adoption of games apps on smart devices, and the transition from physical distribution to digital distribution in established parts of the market such as console gaming. Games are now truly mass market and a very important part of the entertainment sector. Growth has been fuelled by the dominance of free content and in-game monetisation, which expands the adoption of games but also removes the cap on spending for those gamers that are really engaged in the experiences” (Arlan, 2022).

This means that new business models are running in the video game industry, the product or service of the game itself is changing to free games and in-game monetisation. From a process perspective distribution process is changing significantly, and all that means, this is a nice example of digital transformation happening in this industry, as a change of one part or as a whole. To support this change in industry and across time a storytelling models are developed.

The models focused on the distribution process change in subchapter 4.1, game as a product/service in subchapter 4.2. and business model change in subchapter 4.3. Change is supported with several models/storytelling scenarios, from older pre-digital/physical model, digitalisation included and finally digital transformation. Models illustrate what was/is happening across time, means of implementation and execution. All models are made by authors based on self-experience, case studies, and literature reviews. For evolution of distribution

platforms for example Steam (Sayer & Wilde, 2022), (Le, 2023), historical review of games evolution and change of gaming (Datapath.io, 2017), (Le, 2023), (Karthikeyan, 2022), (Özalp, 2024), games communities and technology selection (Larch, 2023), (Le, 2023). All models are self-made by authors using free icons and photos combined to make figures from the Noun Project (2025) and by using storytelling methodology as described in (Tomičić-Pupek et al, 2019)

Further subtopics and their evaluation are researched, discussed and presented in the next three subchapters presenting digital transformation by type of digital transformation according to (Pihir, 2022). Digital transformation of business process change, digital transformation by product or service, and digital transformation by change of business model.

4.1 Digital transformation of game distribution process

Besides game development and sales, the most important business process in the video game industry is the distribution process. To show the evolution and development of this process over time, during the evolution of the video game industry, several storytelling models are developed and presented the process flow and development.

The models focused on change in time, the implementation and execution of the process. Models present the **gaming industry - digital transformation of the distribution process** from the physical process or pre-digitalisation process (Fig. 3), digitalisation of the process (Fig. 4) and digital transformation of the distribution process (Fig. 5).

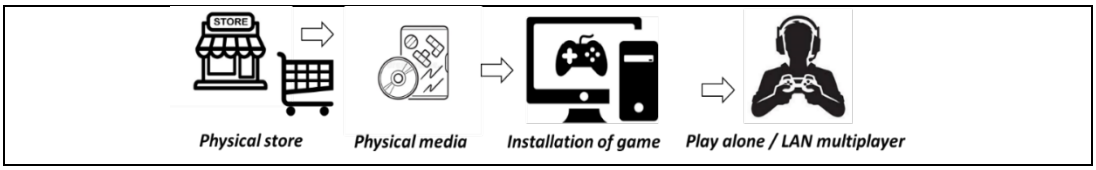

Figure 3. Game distribution process - Physical process, years 1980'/90'-2010'+ (authors)

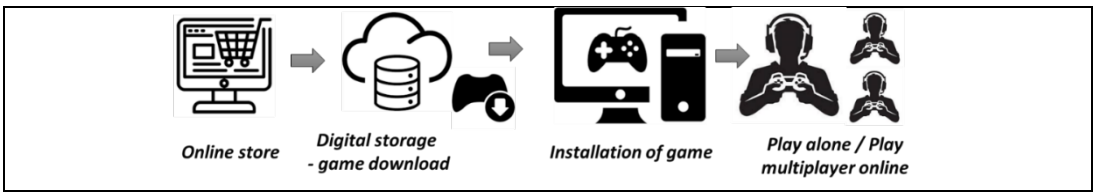

Figure 4. Game distribution process - Digitalization of process, years 2010' – 2020'+ (authors)

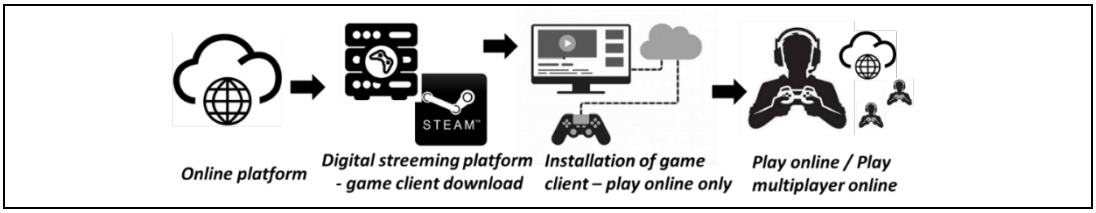

Figure 5. Game distribution process - Digital transformation of process, years 2020' – 202x'+ (authors)

Firstly, Fig. 3 presents the distribution process in the physical normal or pre-digital era. Customers buy games in physical stores (mostly bookstores, electronic shops, or similar). Games are stored on physical media (CD/DVD-ROM or memory card). Customers need to install the game on PC or console, and they can play the game. They play alone, multiplayer is on the same device (second controller) or in local networks. The era is from the early 1980s till about 2010.

Fig. 4 presents the digitalisation period in which games are sold mainly online (physical distribution is still present as in Fig. 3, but not for all games; this is just part of the market; most games are sold online. Sales include the download of a game, like a file, from digital online storage or market, installation of the game on PC or console, and playing the game. Games are played solo or in multiplayer, which is now mostly online (hosted on third-party host servers); local LAN multiplayer is not a dominant type of play. The era is from 2010 to 2020. Later,

Fig. 5 describes the digitally transformed distribution process. Games are sold online, by the platform, not for download or installation, but also for streaming the game. Installation is laminated only to the client while most of the game / or connection to the play environment is still on servers. Games can be installed locally on PC or console, but they can and are mostly played online only. Customers play online in single or multiplayer mode, with a mandatory online connection. The era is from 2020 till now 2025.

A case study for this part could be Half-Life 1 from 1998 is an old physical distribution game case study, or Call of Duty (CoD) in (Fig.3).

Half-Life 2, since 2004. (Fig.4) was the first platform release game coded and distributed online as a download option (sold also in physical distribution for consoles and "older players"). Example are also Microsoft Age of Empires (AoE) with its editions.

For a new digitally transformed distribution process as streaming and playing (subscription games) case study could be World of Warcraft, or for free of charges games: Enlisted, World of Tanks (WoT), World of Warships (WoW) in Fig. 5.

4.2 Digital transformation of game as product/service

Models in this subchapter focus on the game as a product or service that changes over time, through implementation and physical means, from product to product as a service. Evolution can be seen in detail in literature for the evolution of distribution platforms, e.g. Steam (Sayer & Wilde, 2022), (Le, 2023).

Gaming industry - digital transformation of game as product/service from physical product on media or pre-digitalization (Fig. 6), digitalization of product download as a file (Fig. 7) digitalization of product/product as a service – pay and play (Fig. 8) and digital transformation of product/service - game is online and free (Fig. 9).

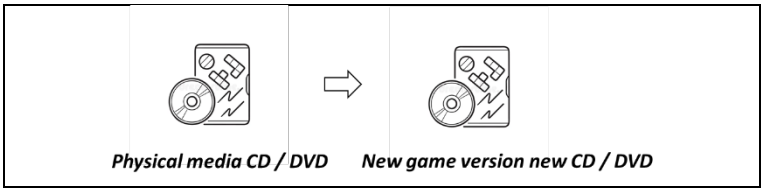

Figure 6. Game as product/service - Physical product on media CD/DVD, years 2000' - 2010'+ (authors)

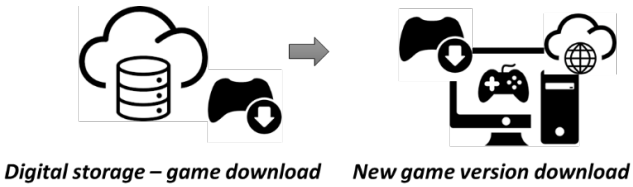

Figure 7. Game as product/service - Digitalization of product download as a file, years 2010' – 2015'+ (authors)

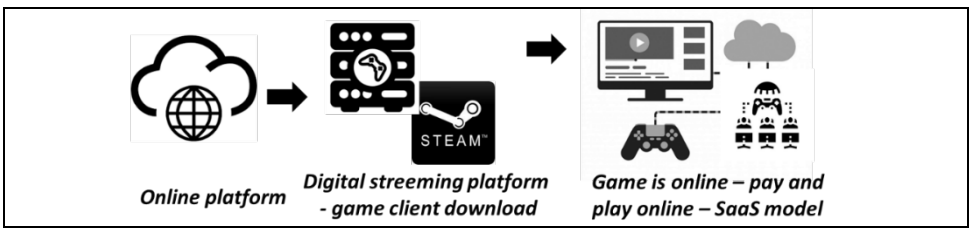

Figure 8. Game as a product/service - Digitization of product product as a service - pay and play, years 2015' - 2020'+ (authors)

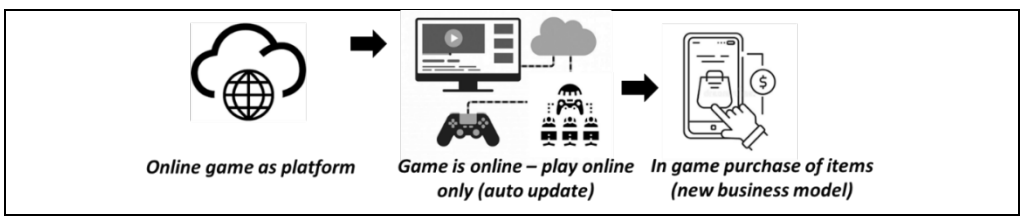

Figure 9. Game as product/service - Digital transformation of product/service - game is online and free, years 2020' – 202x'+ (authors)

Fig. 6. A game as a product/service is stored on physical media sold as a product on media like CD/DVD or memory card. The new game version needs a purchase of new media with new content. The era from 2000 to 2010. Games, e.g., Half-Life, CoD, AoE.

Fig. 7: The game as a product/service is stored digitally as a file on a server. For play, the game needs

to be downloaded, and all new features or extras need to be downloaded again, as a new version. The era from 2010 to 2015 is known as the digitalisation of the product. Fig. 8 game is sold as a service from an online platform where all or part of the game (client) is downloaded to a PC or console. Platform stream games as a service, and the game is mostly present online and played online as a service in a SaaS model. The era from 2015 to 2020 is known as the digitalisation of products exchanged to services.

Fig. 9 game is digital, the game is on a platform. It is played online and only online. A small client is needed on PC or console, but the game is played, and the main content is online. Update of game components is automated and made every day or before the game. The game is normally free. The content of the game itself is free, but some extra content or abilities are purchased within the game. The era from 2020 to the present. Digital transformation of the product/service in the game is fully online and free of charge. Game experience and extra features in the game allow players to buy game resources in-game, but they are not forced to spend real money if they do not want that. Case study games and examples at the end of subchapter 4.3. since they are the same.

4.3 Digital transformation of game as business model

When the digital transformation of the business model is in focus, the video games industry changes over time, and by means of implementation, added value or revenue streams have a lot to offer.

Gaming industry - digital transformation of game as business model from pre-digitalisation of business model - physical business model - physical game sale/media sale (Fig. 10), digitalization of business model - digital game and sequel sale (Fig. 11) digitalization of business model - product as a service - pay and play, (Fig. 12) and digital transformation of business model - game is online and free! Players pay for items in-game (Fig. 13).

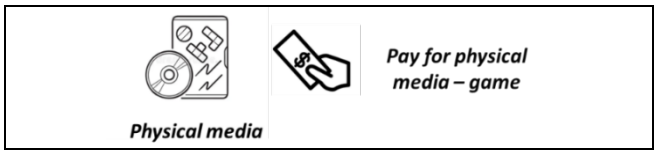

Figure 10. Game as business model - Physical business model - physical game sale / media sale, years 1980'/90'-2010'+ (authors)

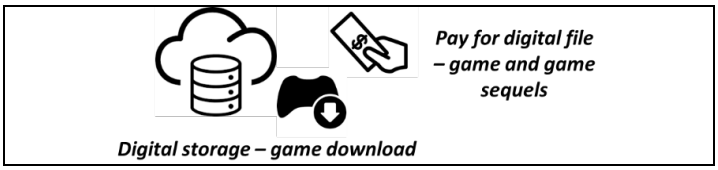

Figure 11. Game as business model - Digitalization of business model - digital game and sequel sale, years 2010' – 2015'+ (authors)

Figure 12. Game as business model - Digitalization of business model - product as a service - pay and play, years 2015' – 2020'+ (authors)

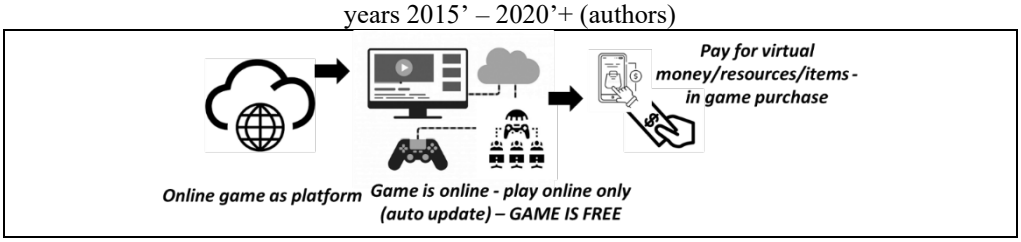

Figure 13. Game as business model - Digital transformation of business model - game is online and free! Player pay for items in game, years 2020' – 202x'+ (authors)

Fig. 10 Physical business model, the game is sold as a product on physical media. The customer pays for physical media. Era from the 1980s to 2010. Fig. 11 Digitalisation of the business model game is sold as a file that needs to be downloaded from digital storage online. The customer pays for a digital file of the game or its sequels. The era from 2010 to 2015. Fig. 12 Digitalisation of the business model of the game is in change from game as a product purchased online to game as a service. The game is digitally streamed from a platform where only the client of the game is downloaded and installed, but the game is played online only or as connected to the platform. Customers pay for online time or a subscription for game/games for some period. Era 2015 till 2020. Fig. 13 Digital transformation of game business model, where the game is only online, and the game is a platform. The game can be played only online or connected, and the game as a product/service is free of charge. Players pay if they want, for extra in-game content or in-game money /resources/items. Era 2020 till now.

A case study for this and the previous part could be the same examples. Any game older, like Half-Life 1, CoD 1and 2, MS AoE 1 and 2, could be in Fig. 6 and Fig. 10. Half-Life 2 from 2004, but most games online downloaded from year 2010+, like Fallout 3, CoD Black Ops, can represent a case study for models in Fig. 7 and Fig. 11. In Fig. 8 and Fig. 12, as digitisation or transformed product to service by streaming and playing (subscription games) could be seen case studies: World of Warcraft, Counter Strike 2, PUBG: Battlegrounds, Warframe, or some of them also in free of charge games Counter-Strike 2, Dota 2, Apex Legends, and Destiny 2. In the category of digitally transformed with in-game purchase and on a free-of-charge platform: Enlisted, World of Tanks, World of Warships, sea Fig. 9 and Fig. 13.

9 Discussion and Conclusion

The video game industry has evolved greatly in the last 25-50 years. Considering the perspectives of types of changes in DT, models from physical product/service to digital, to digital transformation of products/services, have been developed through the paper. The same was done for the video game distribution business process and for the video game industry business model itself.

According to the determinants of DT (Pihir et al, 2019). and the definition of DT (Pihir, 2022), we can conclude that it is an example of digital transformation in which a strategic change with a strategic meaning is made (visible from the trends and sales growth in the introductory analysis). Changes significantly determine the product that later becomes a service. The process is changing significantly from a physical, digitised and ultimately digitally transformed process. The business model is also changing significantly, from charging for the game on the media as a physical medium, to the digitisation of the product into a file that can be downloaded from the online store, then digitisation and change to a service, and ultimately to a free game in which accessories and in-game items can be purchased. All the changes are made by disruptions in time and development, making the change constant in the industry and connected to the final digital transformation, as in (Tomičić-Pupek et al, 2023)

As a second feature/determinant, all these changes in all their forms are focused on users, increasing their number, accessibility and improving the user experience. ICT and process infrastructure, as the third determinant of DT, have been adapted and changed from a pre-digital, digitised and digitally transformed process from physical media, file servers, streaming platforms to online environments and in-game purchases. All this required a shift in thinking, improvement of resources and culture of change among game developers, publishers, sellers and especially in the culture and mindset of the players themselves. The research resulted in the development of a model of these changes by types of digital transformation, creating a good case study for this industry. Numerous changes are clearly shown through periods and the manner of change.

The limitations of the research itself are the small number of examples and the connection to numerous research studies on video game development that are the predominant sources and which are, by nature, professional works related to the time frames within which the changes are positioned and the prevailing model for a particular period. Given that we are dealing with changes over time that we have all witnessed and which are known facts, the brevity of the description and the text that fits into the conference article can be considered limiting factors of this paper.

Concerning student research and its continuation in business models related to digital transformation in the video game industry, the expansion of the research and its continuation are expected.

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