

A Cultural History of the Greek Digital Games Origins: From Clones to Originality

Maximos S. Theodoropoulos

Maximos S. Theodoropoulos, MA

Panteion University of Social and Political Sciences
Department of Communication, Media, and Culture
Leof. Andrea Siggrou 136
176 05 Kallithea, Athens
GREECE
maximostheod@gmail.com



Maximos S. Theodoropoulos is a PhD candidate at the Department of Communication, Media, and Culture of Panteion University of Social and Political Sciences in Athens, Greece. His academic interests include local game production cultures, gaming history, and the convergence between digital games and other cultural industries. He is currently writing his dissertation thesis with a *Hellenic Foundation for Research and Innovation* scholarship, focusing on digital game development in Southern Europe, drawing on three exploratory case studies that include Greece, Italy, and Malta. He was also involved in film productions in various positions, as either a researcher or a crew member mainly in the cinematography department.

ABSTRACT:

Literature on the digital games industry and gaming history has for the most part focused on the global production centres of North America, Western Europe, Japan, and, lately, China. However, in recent years, a call to research the diverse and less dominant national contexts within which digital games are produced has been addressed. In this article, we shed light on early digital game development in Greece, covering the years between 1982 and 2002. This particular region has been highly neglected by both domestic and international researchers. We approach Greek digital game development from both historical and cultural perspectives, through an investigation of how local game developers interact with a wide range of contextual facets in a complex interrelation between global and national conditions. This article argues that, in order to highlight the characteristics of early national game production cultures and digital games design, one must examine them as well under the broader cultural production ecosystem, along with the economic and institutional contexts and transformations within which digital game production takes shape.

KEY WORDS:

cultural industries, digital games, digital games history, game design, Greece.

DOI:

10.34135/actaludologica.2024-7-1.86-106

Introduction

Most game researchers are focusing mainly on the 'global' sites of development and consumption of the digital game industry (Kerr & Cawley, 2012), where the large-scale digital game companies and international production networks are mostly concentrated, such as North America, Japan, Western and Nordic Europe, and, quite recently, China. It comes then as no surprise that literature on the history of digital games and the game industry such as, for example, Donovan's (2010) or Williams' (2017) monographs, tends to construct a generic, universal narrative – nevertheless, much instructive – around the Anglo-American and Japanese contexts and popular, in the Western press, digital games or established franchises. But as Jørgensen et al. (2015) have argued: “This bias is somewhat understandable, but one can argue that the major industries supported by large home markets provide a very particular and somewhat limited perspective on the origins of the global game industry” (p. 2). In addition, this view excludes to a great extent cultures and practices of production that relate to less known, minor local digital game development contexts, where alternative narratives and voices can be found that can unthread the diverse regional complexities of the global digital game industry.

In recent years though, media and game studies have started to address this gap. Kerr (2017) and Liboriussen and Martin (2016) argue that if we want to better understand the digital game industry and market, we should turn our attention to local digital game production and the various ways it is shaped by transnational forces and socio-cultural conditions. Accordingly, different scholars discuss how the interrelation between global and local factors influence the evolution and history of local game industries and its games' genres (Parker & Jenson, 2017). Sotamaa (2021) shows similarly how the Finnish

digital game industry and national production cultures emerged through historical and political developments. Social historical studies on local digital game production have further been conducted on the informal production and distribution modes during the decades of 1980 and 1990 in Czechoslovakia (Švelch, 2018), the Slovak Republic (Koscelníková, 2021) and the UK (Wade, 2016), as well as in the Nordic countries (Jørgensen et al., 2015), where demoscenes helped in forming the current national digital game development landscape. At the same time, Nakamura and Wirman (2021) and Chew (2016) suggest a cultural approach, highlighting the transformations of digital game production practices in China and their effects on the design of Chinese online games in different historical phases. All these scholars show how gaming histories in diverse geographical positions have taken off during the last two decades, illuminating consequently the local game industries dynamics on the far side of transnational Japanese or American companies and digital games design.

On the other hand, a few cases still remain to be examined, having been ignored by game studies. This paper provides an overview of the history of digital game production in Greece. Today digital game development in Greece is thriving in terms of the number of established game studios and new digital games produced and released on the global markets through online platforms. In addition, digital games in Greece have been developed over approximately the last five decades – from the importation of British and American micro-computers to the current boom in local game development. However, so far the research about this particular region has been highly neglected by both national and international literature. There is just limited knowledge about the origins or the evolution of Greek digital gaming. Thus, the aim of this paper is to fill this gap by exploring the evolution and characteristics of early Greek digital game development from a historical perspective, drawing on Peterson and Anand's (2004) production of culture approach.

More specifically, this investigation's main objective is to provide a snapshot of a broader research framework that relates to mapping the production and cultural facets of digital game development in Greece, as well as the types and genres of local-produced digital games and the profiles of the people who developed them, over specific time spans. Since it is rather hard for a single person to find and analyse all the Greek digital games and companies, we will focus here on the main production events, challenges, and digital games that relate to this specific local digital game production context's origins. This research can be understood as a map which can be further divided into several papers. Therefore, this paper is an attempt to collect available information and add data from the research, offering a brief overview of the history of digital game production in Greece during its first twenty years: from 1982 to 2002. In this article, we are particularly interested in how early local digital game developers of a marginalized – regarding the global industry – region with limited resources interact with cultural, political, legal, and technological aspects, gaming markets and genres.

In particular, this investigation is structured as follows. The first section discusses the methodological research models we follow, and the method tools adopted, aiming at shedding light on the historical evolution of the digital game development in Greece. Next, the second section presents the research results, focusing on the early days of Greek digital games. This section is divided into two time periods which, in our opinion, mark a number of important transformations that shape local digital game development cultures and designs, covering the origins of Greek gaming, from the early 1980s to the early 2000s.

Methodology

This research began in 2019 as part of a thesis project to map contemporary Greek digital games development. It became clear that, unlike other local game industries where their evolution and current industrial production traits can be traced in narratives and contextual factors dating back to the 1980s or 1990s (Joseph, 2013; Parker & Jenson, 2017; Ernkvist & Ström, 2018; Chew, 2016; Nakamura & Wirman, 2021; Daiiani & Keogh, 2022), contemporary game developers seem to not share any coherent narrative with the past. In fact, their knowledge about the national gaming history is similar to the general public: *unknown*; or at best, deficient. The research on commercial gaming, not to mention its origins, is also non-existent. The only academic work we could find on this matter is the PhD thesis of Lekkas (2014) about the Greek micro-computer hacker community in the 1980s. But even though it illuminates, in many aspects, parts about the origins of local gaming, it is restricted to localized uses of early computer programming rather than on digital game making. The investigation on Greek gaming history becomes all the more difficult considering that digital game production is characterized by constant disruptions. There is not any transparent production continuity, with the exemption of the related, diachronic struggles and challenges that Greek developers endure, from different periods. And as we have argued elsewhere (Theodoropoulos, 2023), contrary to other Western countries, there has not been any industrial fabric to provide a formal, solid shape to the national indie gaming context. Therefore, there never was any official attempt – nor even an informal one – to map the different developers or archive Greek digital games.

Here, we elaborate, very briefly, on the theoretical frameworks and methodological tools we use to this day with the aim of uncovering a highly fragmented cultural media history such as that of digital games in Greece. More specifically, there are two interrelated theoretical approaches that illuminate the present investigation: a cultural approach to national gaming history and an attempt to frame it under a wider media ecosystem.

First, when assembling a local digital game production history, it is important to place it in an examination of how economic, socio-political, and cultural factors influence production cultures in a national context. For example, the emergence of the current local gaming environment is certainly as shaped by the consequences of the financial crisis as by the various technological and market trends of the global digital game industry (Theodoropoulos, 2023). For this reason, ‘our’ history draws on the contextual factors of the production of culture perspective (Peterson & Anand, 2004), which identifies six contextual facets (technology, industry and organizational structure, market, occupational roles, legislative framework) as central elements of shaping cultural production and cultural products like digital games. We follow this perspective to understand how Greek developers experience and interact with these contextual facets, as the latter are transformed and changing, in a national context. Additionally, as Sotamaa (2021) indicates, when adopting a cultural approach to digital game production and, generally, to gaming content: “instead of looking at games or their design ‘as such’” it is more fruitful to examine “the traditions, conventions, and practices around them and the cultural, social, and historical environments in which they originate” (p. 4).

This approach is related to the second one, which regards digital games as a symbolic work within the broader cultural industry landscape. In particular, we place the national history of digital games as an integral part of a larger media ecosystem where digital games are interconnected with contiguous technological and cultural sectors. Accordingly, this research follows the Greek developers as they interact and are influenced historically by other types of media and cultural industries artefacts or practices, both local

and global. For example, this can be understood by the influence that the importation of micro-computers had in the Greek market; the role that computer and, later, gaming magazines played in popularizing digital games in the 1980s. It is also important to note that, at least in the Greek case, the interaction of local developers with other media, occasionally, worked as a way to overcome challenges associated with being marginalized from the global game industry. This means that some local digital game studios adopted video and photographic cameras and other similar artefacts to create content that could relate to 3D computer graphics, that were the dominant industry trend in the 1990s and 2000s, to compete with the wider industry.

Three types of methodological tools were utilized to collect data according to the aforementioned theoretical frameworks for investigating the history of digital games in Greece.

The first type of tool is interview data. 33 semi-structured interviews were conducted between 2019 and 2023, in Greek, with professionals and hobbyist game developers for the purpose of a larger research on digital game production in Greece. We moreover conducted informal interviews with people who once participated in digital game development. The interviews followed the oral history tradition (Thompson, 2000) which allows for a greater examination of the lived experiences and memory of people whose narratives widen the construction of a certain historical topic. Since there are huge gaps of knowledge in Greek gaming history and there is not any formal or informal digital games' archive in the country, interviews played an extremely important method for accessing knowledge that otherwise would be lost over time. The majority of the collected information for the present investigation exist in the experiences and memories of the interviewees. Following ethical principles, all interviewees were anonymised, informed of the scope of the use of the information provided and consented to its possible citation.

The second tool is primary data collection through documents. More specifically, data was collected from various sources, such as media reports, archived news surveys, product commentaries, magazines, and paratexts like in-game box booklets. In addition to this, equally important in data collection was the online retro gaming archival sites where enthusiasts were discussing or uploading material – such as the digital games themselves – associated with Greek gaming.

This leads us to the third tool used, that is playing some of the digital games in order to better understand their design. That was not always possible due to technological incompatibility or the nonexistence in any online form or emulator. Therefore, we chose instead to access materials we collected, such as manuals, in-game screenshots, or by watching walkthrough videos found on YouTube and other online platforms.

A Period of Adventures and Pirates, 1982-1992

Confining national gaming history to short periods contains the risk of excluding many thematic lines and events. As we already mentioned, the research presented should be read as a map or a call for more studies to be conducted, while it is open to dialogical discussion. Periodization in this article deals *in lieu* of what we consider as major trends and transformations of the Greek production gaming history. Principally those that gave form to the production cultures in each period. The years between 1982 and 1990 can be identified in two definable occurrences: the hatching of the production of digital games

in Greece and the very amateur spirit of the early developers, that began to decline to some extent by the late 1980s and early 1990s.

Even though, creating digital games and experimenting with computing was quite vibrant, several early Greek developers discontinued their game production as informality and the technological obsolescence of 8-bit and 16-bit computers could not promise or offer much promise for profitability and professionalization after 1991 when other systems began to prevail. Furthermore, in contrast to other European cases (cf. Švelch, 2018; Jørgensen et al., 2015; Pérez-Latorre & Navarro-Remesal, 2021) which started off national proto-game development and distribution with the establishment of mainframe computers in laboratories and universities in the post-war era, and popularity of arcade machines, up until the 1980s there was no trace of proto-Greek games. It is sufficient to argue that before the under-examination period, the culture of playing digital games was neglected to a certain extent. However, the existence of national manufacturers of computers or arcade machines was also extremely scarce to help cultivate an interest in experimenting with digital game making. In our opinion this is because of what Dritsa et al. (2018) have argued:

... there is no continuity in the development of computing in Greece. Instead, the evolution is punctuated with bursts of technological developments. ... Possible reasons include the market's small size and insularity, the high cost of equipment relative to the GDP, red tape, complex localization requirements, and the lack of awareness regarding IT's benefits. (Dritsa et al., 2018, p. 57)

These *technological bursts* not only affected Greek digital game production in the 1980s but continue to this day. In consideration with Lekkas' (2014) study and our research on the analysis of the archive data, digital games, and interviews, there are three key factors that emerged throughout the period between 1982 and 1992 and which gave form and shaped the origins of digital game production cultures in Greece. These key factors can be outlined as follows: a) the advent of micro-computers, b) the wide circulation of computer magazines and diffusion of gaming listings, and c) the importance of informal practices like piracy and cloning.

By 1982, numerous 8-bit micro-computers as the Sinclair ZX Spectrum, Commodore 64, Oric Atmos, BBC micro, Dragon 32/65 and, after 1985, 16-bit micro-computers like the Atari ST, to name but a few, started to enter the Greek hardware market, to which those technologies were utterly new (Lekka et al., 2012). Even if it was a small market, micro-computer sales were booming as marked by the very high sales in Greece throughout the examined decade. Eventually, a new computer and programming culture was born among the Greek users. In particular, the British Sinclair ZX81 and American Commodore 64 became the most popular platforms in numbers of sales (Lekkas, 2014), but also in terms of the digital games and gamified demos being produced for these two platforms, as our research has found.

Lekkas (2014) argues that the popularity of these technological platforms was due to their extremely low price, their easy installation that did not demand high technological expertise from the Greek users, who by then did not have any computing knowledge, and finally digital games. For the most part, digital games – in the form of 'computer games' – tended in time to occupy all the other possible uses of micro-computers either by creating or playing them (Lekkas, 2014). Digital games, thus, turned into a very strong reason to buy a computer. It is interesting to note that, eventually, micro-computers ended up being called 'as such'. Greek users and computer magazines were alternatively calling these platforms *game machines* (Lekkas & Tympas, 2020). In line with Lekkas, the saleswoman of *Egefalos*, which was one of the most known computer stores in Athens, mentioned in a recent interview that games for micro-computers were so popular that "we only sold

computers that (were meant for) playing games” like those of Sinclair and Commodore (Kostas “The Punisher”, 2023, p. 56). Not being able to create games for consoles and arcades because of the lack of the related infrastructure (and marginalization from the other Western markets), those alternative *Game Machines* must be considered as a milestone in Greek gaming history.



Picture 1: Pixel had a permanent column for how to crack a digital game’s code. This issue offers the program listing of Pinball Wizard (Sagittarian Software, 1983)¹

Source: Tsouanas, 1985, p. 40

Computer magazines also emerged in 1982. By the end of the decade, twenty-seven computer magazines were being circulated (Dritsa et al., 2018; Lekkas, 2014), most of which transformed computer gaming-only oriented content. Magazines like Pixel, Micromad, Game Pro, User, among others, played a central role not only in the proliferation of computer sales, but also to the nascent local digital game production.

1 Remark by the author: Title transl.: “Break Pinball”. Sketch transl.: “But, it’s against the law!” “Crack!”.

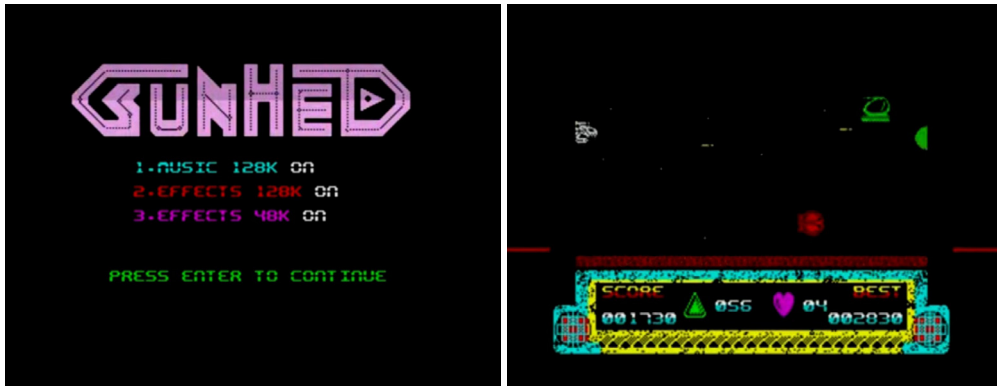
Computer magazines helped Greek users to familiarize themselves with micro-computers and their use, which at the same time further functioned as an educational intermediary to programming expertise and, more notably, to learn how to program digital games. As Lekkas and Tympas (2020) note: “In the absence of formalized education in computing, this user-programmer was to be trained through the magazine by participating in the collective production and use of program listings” (p. 6). In the Greek case, the program listings that magazines were distributing constituted the main pillar for local users to train and learn how to make a digital game on their micro-computer at home. Written on a page of a computer magazine, those listings were essentially computing commands, which, if you transferred them to a micro-computer, allowed you to ‘run’ a software program. As the demand for digital games was intense, a high proportion of listings were in the form of learning how to break the code of popular micro-computer games by cracking it, with the intention to ‘run’ and play costly titles for free as Picture 1 shows, openly promoting the culture of hackers and piracy. Interestingly enough, almost all the interviews we conducted with local developers from the 1980s and 1990s considered gaming listings as the exclusive source on becoming competent in programming. As one interviewee mentions:

Back then we were not able to purchase all the games we wanted to play. So, the listings on magazines helped a lot. You could type the printed code of a game and then play it. But it was also very helpful for someone who didn’t know (coding) and wanted to learn how to create games. That’s how I started game development, through typing listing and adding little by little, small changes.

Finally, this type of cost-free distribution of micro-computer digital games, which simultaneously encouraged hacking and programming, should be investigated in light of informal pirating and production – similarly to other countries’ gaming origins, such as Italy (Fassone, 2017), Iran (Daiiani & Keogh, 2022), and Czechoslovakia in the 1980s (Švelch, 2018; Koscelníková, 2021). The enforcement of the then, newly constructed intellectual property rights was nonexistent. Consequently, individuals via local computer shops, mail or hand-in-hand exchange would extensively distribute cheap illegal copies of foreign digital games: “I sold five copies of games I cracked for the price of one”, as one interviewee pointed out. Local amateur crackers were for the most part teenager computer enthusiasts and university students, coding alone or along with a limited group of friends in their spare time.

Rather than having political sensitivities (Švelch, 2018) or showing off their skills (Jørgensen et al., 2015), Greek crackers followed approximately the same practice as in the Italian context of what Fassone (2017) calls *soft-hacking*. They cracked the copy protection of a foreign digital game to add a different intro with their name on it,² to make it look as though it was made originally by them, or just attached small changes in the code in order to alter some visual or gameplay features. Maybe the most popular change they would incorporate was adding extra or never-ending lives or erasing game over mode, similar to today’s mods. A potent example of soft-hacking practice is *Gunhed* (Hellenic Software, 1990) (Picture 2) a space shooter for ZX Spectrum computers, which is actually a clone of *Delfox* (Zeus Software, 1988). The only change that the Greek cracker made was to replace the intro with a pseudo name’s company, Hellenic Software, as well as to displace the original soundtrack with a midi music cover of *Paranoid* by Black Sabbath in the intro and *The Final Countdown* by Europe when the gameplay starts.

2 Remark by the author: Usually was a pseudonym like a faux company’s name or the cracker’s gaming nickname.



Picture 2: Screenshots from the game *Gunhed* by Hellenic Software (aka Theodoros Develegas) for ZX Spectrum
 Source: author's screenshot from the game *Gunhed* (Hellenic Software, 1990)

Computer shops such as the well-known Thomas Soft would distribute lists with original digital game titles, from which you could ask for one and then their in-house cracker was able to crack it. But that professional type of cracker was quite scarce. The majority of local amateurs favour the development of text-based adventure games, containing very simple graphics and gameplay, which required typing commands. Even though they may lack originality, what is interesting is the use of Greek character fonts (Picture 3) and 'greeklish'³ on local adventure games that also relied on program listings and which became the most popular digital games produced in the national context.



Picture 3: An example of using Greek fonts for creating fantasy text-adventure *Ηρακλής [Hercules]* for Commodore 64
 Source: author's screenshot from the game *Hercules* (Pim Software, 1987)

3 Remark by the author: *Greeklish* is a term describing the use of Greek language written with the Latin script. It became a widely popular term in Greece with the emergence of social media where users tended to use Greeklish to communicate with each other.

Another example of localization are digital games in which the cracker gives full authorship to original companies, but offers a full translation of a particular digital game in Greek. While in some other titles, as in the unlicensed translation of *Footballer of the Year* (Gremlin Graphics, 1986), he⁴ replaces the names of English teams with teams named from the Greek league (i.e. Aek and Olympiakos), providing full credit to the original developers of Gremlin Graphics (Picture 4). In general, it can be argued that the Greek language localization makes them distinctive from the latinized texts of the other European digital games. Most of them targeted developer's friends and family members. Most of these local digital games are lost in the abyss. Further research is required.



Picture 4: The British digital game *Footballer of the Year* localized in Greek

Source: "Footballer of the Year", n.d.

Nevertheless, piracy apparently seemed not to be a sustainable practice. Local publishers and distributors were completely absent as there was not any connection to foreign markets at that time for Greek developers. But also, the lack of coordination and technological policy, the wider societal fear of information technologies among Greek society, the small domestic market, and the lack of original ideas restricted any opportunity for professionalization and bridges to the growth of an industrial structure, as happened in other European cases.

A Period of Chaos and Formalization, 1993-2002

The second generation of local game developers saw the dawn of a very vivid period, but still immature and chaotic in comparison with digital game industries in North America, Japan, or Western Europe. In spite of that, during 1993 and 2002 one can observe intensive digital games development in Greece. The exclusive hobbyist gaming production cultures of micro-computers started to be replaced by more professionalized forms of game development on PC, which stimulated the birth of the first Greek game companies which invested on digital games. Therefore, in that transformative period, an important number of original digital games and newly established national game studios (i.e. amateur teams or teams of individuals without the legal status of a company), game production and distribution companies, continuously appeared.

4 Remark by the author: As in most 1980s national gaming contexts (Wade, 2016), producing, hacking, and cracking digital games was young boys only playing field also in Greece.

Although an industrial and organizational structure was not sufficiently constructed to solemnly synthesize a long-term sustainable ecosystem that could help local developers to internationalize and grow, the broad diffusion of commercial Greek digital games in the national market would characterize a fruitful period for local gaming production. A tendency towards a more formal and fresh *proto-industry* appeared.

The first Greek digital game company was Spin Software, which released 10 digital games for 16-bit micro-computers and PCs in 1993. It was a subsidiary company of Compupress which was responsible for the diffusion of computer magazines, like Computer for All and Pixel, and thus were pioneers of the distribution of program listings and the training of Greek computer users (Lekkas & Tympas, 2020). An interviewee who was one of the directors of Compupress at the time, told us that the company, already established by then, had successfully submitted a proposal to the ECC for 50% co-funding of digital games production. That's how Spin Software was initially born. This was quite innovative for the time. Years before national government support and EU initiatives dedicated to gaming (Kerr, 2013; Nieborg & de Kloet, 2017), Spin Software became then a potent example of a European digital game company that ensured early public funding. Despite not having in-house game developers or ways to find professionals, they took an alternative route, as in the Italian case of Simulmondo – also one of the first digital game companies in Italy – who did before (see Venturi, 2020): they posted a call, Pixel for amateurs, to send an original digital game copy. Eventually, the developers with the best copies would be rewarded with a job in Spin Software via which they could develop with others a better version of their digital games with the purpose of publishing it on the local market. That how Vaggelis Kratsas developed *Vandor: 10 Δοκιμασίες* [Vandor: The 10 Challenges] (Kratsas, 1993) (Picture 5), the first Greek commercial text-based adventure game with colourful graphics:

After I finished the text adventure, I sent it to Pixel and after a while I received a phone call which invited me to go the magazine's office. There they ... explained to me that Compupress has a (new) game production company, Spin Software, and that they liked the text adventure, so they wanted to collaborate on the creation of a graphic adventure title, which I wrote. I accepted the offer and begun designing the new adventure [game]. (Fallen Angel, 2017)



Picture 5: Screenshot of the commands given in Greek of the game *Vandor: The 10 Challenges*, published by Spin Software

Source: Fallen Angel, 2017

This event indicates to some extent how Greek digital game amateurs gradually started to transform into professionals, organized inside a company structure. Spin Software, however, even if it managed to distribute ten commercial titles in 1993, failed to meet expectations relatively quickly. As a director at the company states:

The idea was to further grow to a big software house like those in the UK and elsewhere. We wanted to be the first ones to construct a [digital] game industry in Greece and accumulate the best talents. But unfortunately, there wasn't adequate interest from the market⁵ and the consumers, resulting in its suspension and not evolving to the creation of a Greek gaming software house as planned from the beginning. After all, against this was a big part of the Greek PC gamers whose faith was in the famous 'information wants to be free' [original in English].

On the other hand, in our opinion, there were larger domestic and international challenges than piracy and the disinterest of the market, which highlight the production cultures of the local game studios that emerged during this period. To better illustrate this point, the organization structures local game companies followed were apparently messy to chaotic. Most local game studios consisted mainly of very small teams of one-to-four individuals, producing between one to three digital games. There was not any form of division of labour. Everyone was doing a little bit of something, where a developer embraced labour intensive multi-tasking practices and who was simultaneously a writer, a director, a programmer, as well as occasionally being responsible for marketing promotion.

Moreover, one of the biggest obstacles those early developers faced was the deafening absence of game development expertise and the experience needed to learn how to produce and market digital games and run a related company. Training in game development most of the time was learned in situ, through trial-and-error or from the feedback of consumers received only after a digital game's release. Many also had second jobs to make a living. All this resulted in various precarious forms of working conditions, prevalent in the wider digital games industry (Consalvo, 2008). Thus, although the professionalization and commercialization of local digital game production had begun, the amateur structures adopted were dominant. Nonetheless, the production cultures of the early digital game companies in Greece were close to what today we call *indie* gaming (Ruffino, 2013), way before the American-focused documentary *Indie Game: The Movie* (Swirsky & Pajot, 2012). This is rather expressed by the professional development team of Anima Interactive in the manual of their first FMV title, *Συνωμοσίες* [Conspiracies] (Anima Interactive, 2002) (Picture 6):

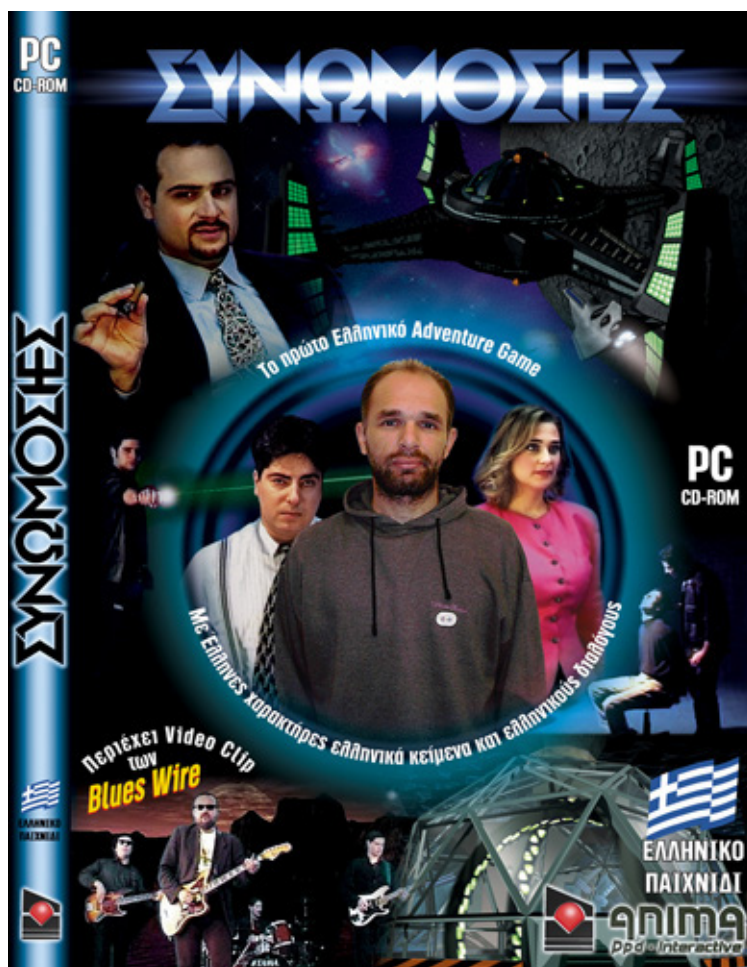
The team of the individuals who worked are primarily 'gamers' like you, that have much appetite and passion to create a game with Greek dialogue, protagonists, and a lot of humour. The difficulties we faced seemed often to be insurmountable and the option to quit was the most rational choice. But our faith that there are people out there that'd love a Greek game armed us with the required courage and strength to carry it out.

A peculiar case of small developers that started as a small team and then became large during this period was Gennadios School Publications. As its name points out, it formed inside a well-known private school in Athens by members who worked there as teachers. Despite the limited budget and lack of hard notion corporate hierarchy, the company was creatively autonomous from the rest of the school. It began to steadily grow in size after the successful release of three short arcade-like/semi-visual novel titles based on the universally famous myths of *Hercules* (Gennadios School Publications, 1996) the

5 Remark by the author: More precisely, here, he means that the brick-and-mortar stores were not interested in the risk involved in buying and eventually selling a digital game 'made in Greece'.

Hunchback of Notre Dame (Gennadios School Publications, 1997) and *Mulan* (Gennadios School Publications, 1999), targeting 6-12 year old children. More than a random choice, those digital games for PC were based on Disney animation movies of the same name. Therefore, they capitalized informally on the success of a global conglomerate, making unlicensed Disney digital games:

As you can understand, if Disney was about to release a movie during Christmas, we tried to take advantage of the fuss and publish our same [content] title simultaneously with Disney. If we had released it later, we would have lost loads of money. ... So, we capitalized on the fuzziness of the huge marketing that Disney was doing.



Picture 6: Box cover of the game *Conspiracies* for PC by Anima Interactive⁶

Source: author's photo taken from the cover of the game *Συνομωσίες* (Anima Interactive, 2002)

This is just one of the many examples of how, marginalized from the global industry game companies can find alternative ways to create and promote digital games in symbiosis with transnational cultural products. But that was not the only cultural industry Gennadios School Publications converged with. As it was difficult to search for individuals with a digital

6 Remark by the author: Text transl.: "The first Greek adventure game. With Greek protagonists, Greek texts and Greek subtitles". As already argued it is not truly the first Greek adventure digital game, but it's one of the first that uses FMV technology in Greece.

game programming or designing background, the company instead decided to put emphasis on animations. As a result, it tended to collaborate with comic/sketch artists and, most importantly, it established good relations with the Department of Graphic Design of the University of West Attica, from which the company contracted the majority of its employees.

Furthermore, in order to avoid competition with the more popular foreign game companies, it adopted rigorous marketing campaigns in rural areas where it was not easy to buy digital games, as well as collaborating not only with local computer stores, but also with many bookstores; namely, places where it was not usual to find gaming products. This marketing tactic was eagerly adopted by the two other digital game publishers (MLS and Centric). In this sense, we believe that convergence with other cultural sectors (education, comics, books, graphic design), instead of with high-technology industries, is significant for production cultures and media historiography, as, in the case of Gennadios we can observe a type of 'media convergence' (Jenkins, 2006) that happened locally in a marginalized context, before convergence as a concept became popular.

Finally, the company's signature title was the shoot'em-up *Κρίση στο Αιγαίο* [Crisis at Aegean Sea] (Gennadios School Publications, 1998) (Picture 7), considering its popularity among Greek consumers. Yet, it developed internally a diverse library of numerous digital games and published many other titles produced externally by smaller local teams: from arcade-style, shooters, and multimedia/educational titles to punkish (*Γίνε Πρόεδρος Ποδοσφαίρου* [Become Football President] [Volax Interactive, 1999]) and gothic themed (*Erevos* [Nyx, 2002]) digital games.



Picture 7: *Crisis at Aegean Sea* by Gennadios School Publications

Source: Hall of First Person Games – Obscure FPS Archiv, 2019

Another notable Greek digital game studio of this period was Volax Interactive (after 2000 it would be renamed as Icehole Games) and InterAction Studios. Both are operated mainly by one-person teams – collaborating with no more than two third-party individuals for each title and have developed acclaimed digital games, including *World Basketball*

Manager (Volax Interactive, 1998) and *Chicken Invaders* (InterAction Studios, 2002) which since then have had multiple sequels, respectively. Those two local digital game studios would be the longest running developers in the Greek context. InterAction, the oldest active Greek digital game company, is still publishing titles up to this day, while Icehole only ceased operation during 2019. An investigation in to the design of early Greek digital games shows that it is strongly influenced by cultural, social, technological, and economic facets of interrelated global and local specificities.

The mid-90s was a crucial era for digital games industry. It experienced the transition from two-dimensional (2D) to three-dimensional (3D) graphical representation in digital game design, along with the release of game consoles from the USA and from Japanese manufacturers that were introduced with highly polished blockbuster digital games (Arsenault et al., 2013). Titles like *DOOM* (id Software, 1993), 3D processor units for PCs from 1995 onwards, and Nintendo, PlayStation or Xbox home consoles permeated *inter alia* gaming (consumer) culture also in Greece. In these circumstances, what does then eventually happen for marginalized Greek developers, who work with fewer resources in smaller teams, as well as lack digital game making experience and knowledge, when demand is determined foremost by foreign goods?

The Greek-developed digital games of this particular period strive for visibility that functions under distinctive national features. There is a need to create a Greek style on the one hand, in addition to the need to produce something than can relate, at least, visually to international standards, on the other. Consequently, the majority of local developers are using exclusively Greek fonts in-game, including paratexts written also in the Greek language. In the case of FMV games such as *Conspiracies* and later *Συνομοσίες II: Φονικό Δίκτυο* [Conspiracies II: Lethal Networks] (Anima Interactive, 2011), you can hear actors speaking and interacting with objects in their native language. In today's hyper-globalized world, it is rather rare to play a digital game entirely in Greek, but for that time, this strategy promoted equivalent accessibility and – at the risk of sounding nationalistic – digital cultural products that expressed a different, more locally-produced cultural content. Greek digital games thus offered a welcoming alternative for the local players.

In accordance with that, there is moreover an extensive tendency in using local themes inspired by Greek humour and history or contemporary events and culture mixing them with international established genres. An example is *Ναυμαχία* [Battleship] (Spin Software, 1993) which is basically a WWII version of the famous foreign board game *Battleship* where Greek partisans fight Nazis. The digital game simulates the gameplay aesthetics of the original board game. But it adds sarcastic Greekish names to the German soldiers, while mocking players when they miss a number of rounds, presenting a pre-rendered animation and lines from the humourist shadow play from Greek folklore 'Karagiozis'. The military-themed *Crisis at Aegean Sea* is set in an alternate present where Turks have occupied Greece –which the player must liberate– due to a political misunderstanding. The game's narrative is apparently contextualized by the Greek-Turkish incident in 1996. *Become Football President* (Volax Interactive, 1999), published by Gennadios School Publications, satirizes the popular series *Football Manager* utilizing simple mechanics and comic-style graphics. Rather than being a sport manager simulation, the title developed by Thanasis Triantafyllou, who went on to form Icehole Games in the early 2000s, makes you take the role of a Greek football president who will speak in vulgar language, fix matches and bribe referees in the Greek football league, parodying overall the corruption which dominates 'traditional' football in Greece. The *Chicken Invaders* series is a direct parody of *Space Invaders* (Taito, 1978). More broadly, the presence of humour, satire, and parody in digital games in a localized context, developed along with more global genres and digital games, can be argued that belongs to a greater extent to the wider

European traditions and styles of digital games produced throughout the 1980s and 1990s (Pérez-Latorre & Navarro-Remesal, 2021).

On the other side of the coin, local digital games must also be examined at the same time as transnational products. Our research assumes that with the exemption of InterAction Studios whose solo developer created a proprietary engine, all the other Greek developers adopted programming languages and bought ready-made game engines of that time from abroad. Usually, they were cheap, relatively easy to very easy and flexible to use languages and all-in-one tools, which had the capability to enable digital game production for individuals who did not have any particular programming knowledge, as Unity and Unreal engines have been doing from 2014 onwards (see Nicoll & Keogh, 2019). It's interesting to note that several of the hardware and tools used were technologically obsolete, something that resembles other cases in the European periphery during the 1990s (Švelch, 2021).

Either way, Greek digital games further involve globally recognizable genres, designed in a way to meet, as much as possible, the expectations of the national market in which players are mostly consuming foreign titles. Titles, for instance, like space-shoot-'em-up *Απόδραση-Runaway* [Escape-Runaway] (CyberTech Creations, 1998), published by MLS, has been, where possible, created by using pre-rendered graphics to look visually like a 3D digital game. In some cases, however, it is rather intriguing that local developers turned their attention to technologies from different cultural sectors, as argued by an interviewee: "We well understood that people wanted 3D and we didn't know how to construct such graphics. So, we thought of different alternatives when our colleague brought a Sony Mavica".

More specifically, Anima Interactive, which begun as a TV advertisement production company, took advantage of the importation of the first HD video cameras and HD systems in Greece and used real humans via a blue screen, to integrate FMV photorealism in their title. In a similar way, *Συμμορία των Αθηνών* [Gang of Athens] (Gennadios School Publications, 2000) (Picture 8) by Gennadios School Publications, is an FPS, designed entirely from thousands of static photos thanks to then new digital cameras. In its production, in place of NPCs and avatars, student cinema/theatre actors played the roles of the Athenian 'gang': "I am speaking now for ultra-photorealist graphics. They couldn't get any better. It was real photography!". That also means that a player could navigate in the Athenian environment of that period through still images.



Picture 8: Shooting inside the Greek metro station of Omonia of the 1990s, using still photography

Source: author's screenshot from the game *Συμμορία των Αθηνών* (Gennadios School Publications, 2000)

Finally, a special mention should be written about *Erevos* (Nyx, 2002) (Picture 9) by Nyx studio from Thessaloniki – the only developer team from Thessaloniki, “the darkest ever themed game from Greece”. It is a first-person horror adventure game where you play as a vampire. *Erevos* was produced on the, by then, obsolete programming language of Visual Basic and most of its 3D graphics are mainly pre-rendered images. Yet, this digital game also makes use of still photography and cut-scenes,⁷ created using again digital video cameras with real individuals. Additionally, the final in-game aesthetics were inspired by the American film *Blair Witch Project* (Myrich & Sánchez, 1999) released the year the game started production. In a way, *Erevos* feels like you are playing in a vampiresque version of the film with disturbing moments. A unique immersive aspect of its design is not allowing gameplay during the day due to a specific mechanic, that locks-out players. That makes sense, since the protagonist avatar is a vampire and the narration happens at night. Thus, in order to play you must open it after midnight, otherwise changing the computer’s clock is required.



Picture 9: Screenshots from the horror game *Erevos* by Nyx and its *Blair Witch Project* vibes
Source: author’s screenshots from the game *Erevos* (Nyx, 2002)

All the aforementioned Greek digital games cited in this section must be examined as potent examples of how the global digital game industry and, generally, internationally cultural or technological trends are concurrently shaping whilst at the same time interrelated with locally-produced titles. This condition will change radically in the next few years. From now on, Greek developers will attempt to internationalize, as digital platforms with new opportunities will steadily come to the surface. Yet, this highly transnational aspect of digital game production cultures in Greece, during those years, are what makes early Greek gaming design style distinctive just like ‘French touch’ or ‘Italian connection’ design traits (Donovan, 2010).

Conclusion

This article contributes to shedding light on the *early* digital game production cultures and digital games design in Greece, spanning 1982 to 2002. Greek digital game development has been absent in any form of referencing by domestic or international studies. Studies that offer insights on either global (Kerr, 2017) or European digital game production contexts (Nieborg & de Kloet, 2017; Pérez-Latorre & Navarro-Remesal, 2021),

7 Remark by the author: Cut-scenes were first introduced in the 1990s, often offering a cinematic appeal to digital games. It is not a coincidence that the developers of *Erevos* chose to add cut-scenes to their title, following the design trends of the era.

as well as works on gaming history (Donovan, 2010; Williams, 2017), have ultimately overlooked this national case study. Of course, this can also be a symptom of the relatively small number of active game scholars in Greece, in conjunction with the equally small size of the local digital game development community and the wider indifference local developers experience from both national institutions and the public. Therefore, following the recent call for a more localized research approach to digital game production, we attempted to reconstruct the history of the early Greek digital game development context by focusing on the various transformations and tendencies that took place. We argued that the production of digital games in Greece is shaped by a complex interaction of local and global conditions and trends, within a larger cultural production ecosystem.

The characteristics of digital game production throughout the first period (1982-1992) are influenced by the import of foreign micro-computers and the widespread circulation of computer magazines that altogether diffuse technological knowledge and expertise among the Greek users. Playing and coding digital games became the dominant way of using a micro-computer at home. Piracy also tended to be the main practice of distributing digital games. It was also highly encouraged by the local computer magazines in the form of the publication of program listings, many of which were the written code of popular foreign computer titles. If it was not for this series of events and, primarily, for the Greek crackers to acquire knowledge and skills from informal practices, digital game development in Greece would have happened much later. Even so, challenges related to domestic conditions did not allow the local game development to grow.

However, the second period (1993-2002) witnessed a vivid environment for national digital game production. This period incorporated, in the first instance, opportunities for professionalization. More specifically, during those years, a more formalized digital game production structure emerged, wherein game companies formed and began developing commercial digital games. Greek developers embraced the financial opportunities of selling digital games for profit, while expressing at the same time their creativity in what were new, for them, digital means. Even though local game studios lacked access to international networks and markets, they distributed their products exclusively on the small national consumer market. That meant that they had to invent distinct ways to make their digital games visible, so as to attract attention to the Greek texts, local themes, obsolete but easy-to-learn technologies, and/or to detect alternative distribution routes (for instance, bookstores and rural areas). Today, neither Greek language nor locally-inspired themes are lucky enough to be found in contemporary Greek digital games.

Finally, this research further reveals an intensive convergence with other cultural industries. For example, the majority of the developers were not originally programmers or designers, but individuals that came from other cultural fields (i.e. graphic design, music, video making, multimedia). Meanwhile, companies capitalized on internationally popular genres and animation film marketing (i.e. Disney films). In the cases of a few local digital games, photography and video cameras were used as the main game production tools. This type of convergence places Greek digital game development in a wider transnationally cultural ecosystem.

Unfortunately, none of the companies or game studios were able to survive. The only exception was that of InterAction Studios, with all the other companies ceasing operations after a while. Interviewees from both periods examined, always argued that developing digital games in Greece was practically an impossible task, in terms of both the absence of infrastructures, as well as being outside of the main digital game production centres: "There was not a way to live from making games here. After I became a father, I quit and did something completely different. If I was born in England, then I would have given you another answer". In a similar vein, a developer explained that:

I worked for 16 hours a day: eight hours in my first job to have food for me and my family and the rest were for getting the game completed. ... There was a lot of stress that resulted in a heart attack. After that I said 'enough!'. I could only continue if a venture capitalist came and paid me for developing a game. But c'mon... where you could find one here?.

Additionally, a mix of mismanagement of project planning, lack of deep technical knowledge, budget-limitations, and the indifference of public institutions to acknowledge local digital game production, if not support it, represent just a number of the chronic challenges local developers were facing and still face right up to the present time. Studying digital games in Greece means studying the history of an apparently marginal gaming field, which has not been able to create a solid industrial infrastructure that can relate neither to the Western nor East-Asian digital game industries.

In conclusion, in this article we strove to illuminate the yet unresearched origins of digital game development contexts in Greece and establish a starting point for further studies, and thus to contribute to the ongoing investigations on national digital game production contexts by taking into account their distinct regional specificities and developers' 'voices'.

Acknowledgement: *The research project is implemented in the framework of H.F.R.I call "3rd Call for H.F.R.I.'s Research Projects to Support Faculty Members & Researchers" (H.F.R.I. Project Number: 5203).*

BIBLIOGRAPHY

- Anima Interactive. (2002). *Συνωμοσίες* [Digital game]. Got Game Entertainment; GMX Media.
- Anima Interactive. (2011). *Συνωμοσίες II: Φονικό Δίκτυο* [Digital game]. Anima Interactive.
- Arsenault, D., Côté, P.-M., Larochelle, A., & Lebel, S. (2013). Graphical technologies, innovation and aesthetics in the video game industry: a case study of the shift from 2d to 3d graphics in the 1990s. *G|A|M|E The Italian Journal of Game Studies*, 2(1), 79-89.
- Consalvo, M. (2008). Crunched by passion: Women game developers and workplace challenges. In Y. Kafai, C. Heeter, J. Denner, & J. Y. Sun (Eds.), *Beyond Barbie and Mortal Kombat* (pp. 117-190). MIT Press. <https://doi.org/10.7551/mitpress/7477.003.0017>
- CyberTech Creations. (1998). *Απόδραση-Runaway* [Digital game]. MLS.
- Daiiani, M., & Keogh, B. (2022). An Iranian videogame industry? Localizing videogame production beyond the "global" videogame industry. *Media Industries*, 9(1), 37-66. <https://doi.org/10.3998/mij.89>
- Donovan, T. (2010). *Replay: The history of video games*. Yellow Ant.
- Dritsa, K., Mitropoulos, D., & Spinellis, D. (2018). Aspects of the history of computing in modern Greece. *IEEE Annals of the History of Computing*, 40(1), 47-60. <https://doi.org/10.1109/MAHC.2018.012171267>
- Ernkvist, M., & Ström, P. (2018). Differentiation in digital creative industry cluster dynamics: the growth and decline of the Japanese video game software industry. *Geografiska Annaler: Series B, Human Geography*, 100(3), 263-286. <https://doi.org/10.1080/04353684.2017.1423506>
- Fallen Angel. (2017, June 11). *Γνωρίζουμε τους Έλληνες game developers: Βαγγέλης Κράτσας* [We meet Greek game developers: Vaggelis Kratsas] [Interview]. Adventure Advocate. <https://adventureadvocate.gr/apopseis/item/game-developers-2>
- Fassone, R. (2017). Cammelli and Attack of the Mutant Camels: A variantology of Italian video games of the 1980s. *Well Played Journal*, 6(2), 55-71.
- Footballer of the Year. (n.d.). GameBase64. Retrieved June 6, 2024, from <https://gb64.com/game.php?id=9214&d=33&h=0>
- Gennadios School Publications. (1996). *Hercules* [Digital game]. Gennadios School Publications.

- Gennadios School Publications. (1997). *Hunchback of Notre Dame* [Digital game]. Gennadios School Publications.
- Gennadios School Publications. (1998). *Κρίση στο Αιγαίο* [Digital game]. Gennadios School Publications.
- Gennadios School Publications. (1999). *Mulan* [Digital game]. Gennadios School Publications.
- Gennadios School Publications. (2000). *Συμμορία των Αθηνών* [Digital game]. Gennadios School Publications.
- Gremlin Graphics. (1986). *Footballer of the Year* [Digital game]. Kixx; Gremlin Interactive.
- Hall of First Person Games – Obscure FPS Archiv. (2019, December 11). *Crisis in the Aegean Sea (1997) PC “Griechisch/Greek”* [Video]. YouTube. https://www.youtube.com/watch?v=1SXO_h-3dHg&t=309s
- Hellenic Software. (1990). *Gunhed* [Digital game]. Hellenic Software.
- Chew, M. M. (2019). A critical cultural history of online games in China, 1995-2015. *Games and Culture*, 14(3), 195-215. <https://doi.org/10.1177/1555412016661457>
- id Software. (1993). *DOOM* (MS-DOS version) [Digital game]. id Software.
- InterAction Studios. (2002). *Chicken Invaders* [Digital game]. InterAction studios.
- Jenkins, H. (2006). *Convergence culture where old and new media collide*. New York University Press.
- Jørgensen, K., Sandqvist, U., & Sotamaa, O. (2017). From hobbyists to entrepreneurs: On the formation of the Nordic game industry. *Convergence*, 23(5), 457-476. <https://doi.org/10.1177/1354856515617853>
- Joseph, D. (2013). The Toronto indies: Some assemblage required. *Loading... The Journal of the Canadian Game Studies Association*, 7(11), 92-105.
- Kerr, A. (2017). *Global games. Production, circulation and policy in the networked era*. Routledge. <https://doi.org/10.4324/9780203704028>
- Kerr, A. (2013). Space wars: The politics of games production in Europe. In N. B. Huntemann, & B. Aslinger (Eds), *Gaming Globally* (pp. 215-231). Palgrave Macmillan. https://doi.org/10.1057/9781137006332_16
- Kerr, A., & Cawley, A. (2012). The spatialisation of the digital games industry: Lessons from Ireland. *International Journal of Cultural Policy*, 18(4), 398-418. <https://doi.org/10.1080/10286632.2011.598515>
- Koscelníková, M. (2021). History of Slovak video games and their localization. Translation in time and time in translation [Special issue]. *BRIDGE: Trends and Traditions in Translation and Interpreting Studies*, 2(1), 68-87.
- Kostas “The Punisher”. (2023, September). Συνέντευξη με την Δεσποίνα Χαραλαμπίδου ιδιοκτήτρια του καταστήματος Εγκέφαλος [Interview with Despoina Charalampidou the owner of Eggefalos store]. *Retroid*, 9(1), 55-56.
- Kratsas, V. (1993). *Vandor: 10 Δοκιμασίες* [Digital game]. Spin Software.
- Lekka, A., Chalkides, A., & Proedrou, M. (2012). *Abacus — aspects of computer history in Greece*. National Hellenic Research Foundation.
- Lekkas, T. (2014). *Δημόσια εικόνα και κοινότητες χρηστών των οικιακών υπολογιστών στην Ελλάδα, 1980-1990* [Public image and user communities of the home computers in Greece, 1980-1990] [Doctoral dissertation]. National and Kapodistrian University of Athens. <http://hdl.handle.net/10442/hedi/47515>
- Lekkas, T., & Tympas, A. (2020). Global machines and local magazines in 1980s Greece: The exemplary case of the Pixel Magazine. *WiderScreen*, 23(2-3), 1-24. http://widerscreen.fi/assets/Lekkas_Tympas_2_3_2020.pdf
- Liboriussen, B., & Martin, P. (2016). Regional game studies. *Game Studies*, 16(1). https://doi.org/10.1007/978-3-031-23161-2_301000
- Myrich, D., & Sánchez, E. (Directors). (1999). *The Blair Witch Project* [Film]. Haxan Films.

- Nakamura, A., & Wirman, H. (2021). The development of greater China's games industry: From copying to imitation to innovation. In O. Sotamaa, & J. Švelch (Eds.), *Game Production Studies* (pp. 275-292). Amsterdam University Press. <https://doi.org/10.1515/9789048551736-016>
- Nicoll, B., & Keogh, B. (2019). *The Unity game engine and the circuits of cultural software*. Palgrave Pivot. <https://doi.org/10.1007/978-3-030-25012-6>
- Nieborg, D. B., & de Kloet, J. (2017). A patchwork of potential: A survey of the European game industry. In A. Fung (Ed.), *Global Game Industries and Cultural Policy* (pp. 201-226). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-40760-9_10
- Nyx. (2002). *Erevos* [Digital game]. Gennadios School Publications.
- Parker, F., & Jenson, J. (2017). Canadian indie games between the global and the local. *Canadian Journal of Communication*, 42(5), 867-891. <http://doi.org/10.22230/cjc.2017v42n5a3229>
- Peterson, R. A., & Anand, N. (2004). The production of culture perspective. *Annual Review of Sociology*, 30(1), 311-334. <https://doi.org/10.1146/annurev.soc.30.012703.110557>
- Pérez-Latorre, Ó., & Navarro-Remesal, V. (2021). Euro Ludens: On the Origins, Playing Region, and Imaginaries of the European Videogame. In V. Navarro-Remesal, & Ó. Pérez-Latorre (Eds.), *Perspectives on the European Videogame* (pp. 15-36). Amsterdam University Press. <https://doi.org/10.1017/9789048550623.002>
- Pim Software. (1987). *Ηρακλής* [Digital game]. Pim Software.
- Ruffino, P. (2013). Narratives of independent production in video game culture. *Loading... The Journal of the Canadian Game Studies Association*, 7(11), 106-121.
- Sagittarian Software. (1983). *Pinball Wizard* [Digital game]. Sagittarian Software.
- Sotamaa, O. (2021). Studying game development cultures. *Games and Culture*, 16(7), 835-854. <https://doi.org/10.1177/15554120211005242>
- Spin Software. (1993). *Ναυμαχία* [Digital game]. Spin Software.
- Swirsky, J., & Pajot, L. (Directors). (2012). *Indie Game: The Movie* [Film]. BlinkWorks Media.
- Švelch, J. (2018). *Gaming the Iron Curtain: How teenagers and amateurs in communist Czechoslovakia claimed the medium of computer games*. MIT Press. <https://doi.org/10.7551/mitpress/10964.001.0001>
- Švelch, J. (2021). Promises of the periphery: Producing games in the communist and transformation-era Czechoslovakia. In O. Sotamaa, & J. Švelch (Eds.), *Game production studies* (pp. 237-256). Amsterdam University Press. <https://doi.org/10.1515/9789048551736-014>
- Taito. (1978). *Space Invaders* [Digital game]. Midway Manufacturing.
- Theodoropoulos, M. (2023). Load game: Η ανεξάρτητη παραγωγή ψηφιακών παιχνιδιών στην Ελλάδα [Load game: The independent digital game production in Greece]. *Open Journal of Animation, Film and Interactive Media in Education and Culture*, 4(1), 1-17. <https://doi.org/10.12681/affinmec.34002>
- Thompson, P. (2000). *The voice of the past: Oral history*. Oxford University Press.
- Tsouanas, N. (1985). Σπάστε το Pinball [Break Pinball]. *Pixel*, 1985(9), 40-42. <https://archive.org/details/details/pixel-gr-009/mode/2up>
- Venturi, I. (2020). *Life of videogames: 8-bit memories*. Bologna.
- Volax Interactive. (1998). *World Basketball Manager* [Digital game]. Volax Interactive.
- Volax Interactive. (1999). *Γίνε Πρόεδρος Ποδοσφαίρου* [Digital game]. Gennadios School Publications.
- Wade, A. (2016). *Playback: A genealogy of 1980s British videogames*. Bloomsbury.
- Williams, A. (2017). *History of digital games: Developments in art, design and interaction*. Routledge. <https://doi.org/10.1201/9781315715377>
- Zeus Software. (1988). *Delfox* [Digital game]. Dinamic Software.

